Learning by Working Together: Analysing Student Responses to Collaboration in Small Teams

Rose Lu & Ulrike Murfett

Collaborative learning has provoked extensive research and findings revealed that collaboration provides better opportunities for active learning. This study was undertaken to explore the impact of collaboration on individual students and group work, in particular, collaborative writing. The results indicated that active learning occurred for this group of 165 second-year Engineering students who read a communication skills course (Technical Communication II, EG1412) that used collaboration in small teams as its main pedagogical paradigm. Apart from the individual acquisition of collaborative skills and knowledge, the concrete result was a collaboratively produced project report of sound quality. Central to this recognition is the necessity of creating a minimal but sustainable structure to scaffold the alignment of collaborative knowledge construction in order to augment effective collaborative learning. It was found that the following factors contributed to student satisfaction with the collaborative learning experience: early teacher assistance to promote a successful team building process, information which allows the teams to implement good time management practices, and methods of work allocation which ensure that each team member participates in all the major tasks associated with a writing project. If these three factors are taken into account, the learning experience and satisfaction that students gain from collaboration on a team project are significant. The insights gained from this study will help designers and teachers of communication skills courses to maximise student learning.

INTRODUCTION

Collaboration and cooperation are sometimes used synonymously while some use the degree of division of labour to distinguish the two terms. Teasley and Roschelle are of the opinion that a collaborative activity requires more than the effective division of labour (Teasley & Roschelle, 1993; Roschelle & Teasley, 1995). They argue that collaboration necessitates that participants are

engaged in a coordinated effort to solve a problem or perform a task together (Teasley & Roschelle, 1993). In collaboration, partners do the work "together". Collaboration is defined as "a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem" (Roschelle & Teasley, 1995: 70).

Some students in project groups tend to think that as long as their assigned work is done, they have fulfilled their role as a group member. However, it was observed that when students in project groups transcend cooperation and engage in collaboration, they tend to manifest characteristics of a fully integrated team and produce better quality work.

Underpinning this definition of collaboration are numerous studies of learners working together to learn and to solve problems. Vygotsky's work (1978) provided a starting point for an approach to understanding how peer interaction can facilitate learning and problem solving. This approach highlights the joint construction of solutions to problems, with solutions being achieved predominantly through discussion (Mercer, 1995).

The advent of this approach illuminates research findings (Brown, 2000; Bruffee, 1999) indicating that, if student-student interdependence is structured appropriately, students will achieve at a higher level as they use higher level reasoning strategies more frequently and are more intrinsically motivated. They have higher levels of achievement motivation, develop more positive interpersonal relationships with each other, value the subject area being studied more, have higher self-esteem, and are more skilled interpersonally.

Two factors seem to positively influence collaborative problem solving and learning:

1. Task structures that promote mutual interdependence among the collaborating students (Knight & Bohlmeyer, 1990).
2. Communication structures that promote the construction of high-level questions and explanations (Webb, 1989).

To a certain measure, this is corroborated by proponents of learning contracts (Gosling, 1993; Stephenson & Laycock, 1993). These contracts are essentially agreements negotiated between student and student or, student and teacher. In a typical small group learning environment, a learning contract involves students in negotiating their learning goals, the methods by which those goals will be met and the means by which the achievement of the goals can be assessed. The increasing use of learning contracts in higher education is seen as a

> ...shift in teaching and learning strategies away from the traditional transmissive mode of formal lectures towards an emphasis on students' responsibility for their own learning... where... students would construct knowledge rather than receive it; would do so with greater independence and opportunity to work in small groups... . (Stephenson & Laycock, 1993: 21)

Thus, it is evident that collaborative learning can result in more higher-level reasoning, frequent generation of new ideas and solutions, greater transfer of what is learned within one situation to another (i.e., group-to-individual and individual-to-group transfers), and higher quality work. In this paper, we will analyse and discuss findings of a study to illustrate some of the ways in which collaboration made an impact on individual students and teamwork, in particular, collaborative writing.

Rationale for Study

Technical Communication II (EG1412), a communication skills course, was offered to second-year engineering students at the National University of Singapore. The course was taught over twelve weeks (one semester) and students had to attend twelve tutorials, each lasting two hours. This course was assessed wholly by continuous assessment. The trademark of EG1412 was collaborative work in small teams of three or four members.

Besides two written assignments – the Peer Critique and the Executive Summary – which were individual assignments, all other assignments called for team effort. The major team project was the production of a team report. Students were given a free hand in forming their project teams. These project teams worked on all the team assignments collaboratively.

At the core of this approach was the belief that students can learn from each other as well as from teachers; students need to be equipped with collaborative skills to meet the rising demand for the ability to work collaboratively at the workplace, and knowledge is constantly created, negotiated and reconstructed.

Recognising the fact that collaborative learning does not just happen and that the expected outcomes may not be realised, some monitoring devices for collaborative work were put in place:

- To prepare the students for collaboration, they were briefed on the expectations of being a member of a team at the very beginning of the course; they were then put through a group dynamics exercise.
- To instil a sense of ownership and accountability, each team was given a "Group Working Plan", which they needed to work on progressively (Appendix 1). This plan aimed to assist the project group in writing the group project collaboratively. Also, each student was given an evaluation sheet, which had to be completed by the end of the course (Appendix 2). These two documents are similar to the learning contracts, as they required members of the group to negotiate their tasks, goals and the means to achieve the goals. At the end of the course, students submitted both documents together with their written team project.
- To assess the progress of the group, clarify doubts or confusion, identify the problems, if any, and offer assistance, teachers listened to oral briefings from project groups. This was done in the third week, after project groups have had some time to work together.
- To provide thorough feedback, conferencing was used. Conferencing sessions were held in the sixth week. Each project group met with the teacher for an hour approximately. This was found to be an effective and non-intrusive "checking" mechanism.

Over the years, much work and effort were put into fine-tuning the implementation, monitoring and assessment of collaborative work in EG1412. Although the teachers were convinced that the students benefited from the experience of collaborative work, it remained a speculation. This prompted the current study to verify if the observation was correct.

Purpose of Study

The study aims to analyse the process of collaboration among student teams, and the students' perception of the effectiveness of collaboration.

METHODOLOGY

At the end of Semester 1, AY2002/2003, a survey was conducted by the course teachers, on 165 second-year civil engineering students in the Faculty of Engineering at the National University of Singapore (NUS). The majority came from a Singaporean background, although there was a relatively small minority from China, Indonesia, New Zealand and other countries in the region. Even though the survey did not differentiate responses according to nationality it should be assumed that individual language skills varied considerably. This said, however, all the students had followed the university's engineering curriculum for one year already and those identified as weak by the Qualifying English Test (QET) had received English language instruction in the previous year. As such, all participants could be considered adequately competent to function successfully in an academic environment, where English is the sole language of instruction.

In addition, all study participants had taken a communication skills course (Technical Communication 1, EG1411) in their first year at NUS and, therefore, had prior knowledge of the principles of audience-centred communication. They were also familiar with the basics of report writing, having done a short individual report as part of their continuous assessment requirement for EG1411.

At the end of the course, after all the tasks associated with EG1412 had been accomplished and the students already knew 70% of their continuous assessment mark, the survey was conducted through the administration of a questionnaire (Appendix 4).

Design of Questionnaire

The questionnaire was designed to elicit students' responses to collaboration and the collaborative work that had taken place during the course. This study focused on two specific areas of interest:

report writing and teamwork. The first section concentrated on the students' perception of how they collaborated and contributed to the writing of the team report, and the impact of collaborative work on learning. Essentially, the intent of the second section was to study the impact of teamwork on the development of skills that would contribute to academic pursuit or personal growth, and to explore students' perception of how integrated their team was.

Administration of Questionnaire

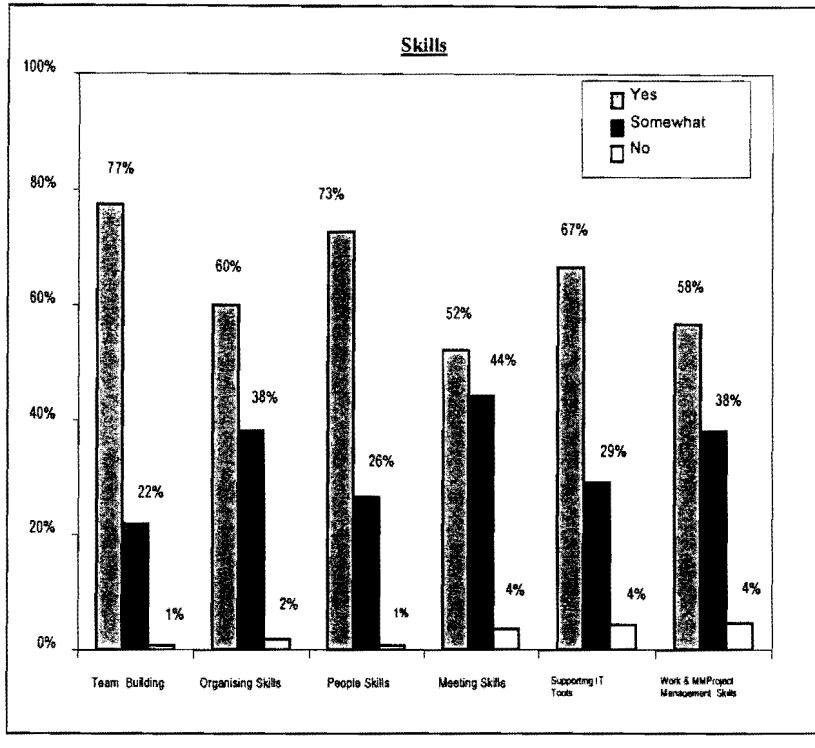
To ensure anonymity within the constraints of the classroom, the students were instructed not to put their names on the questionnaire and reminded that handwriting recognition by the teachers was not possible, as all assignments in EG1412 had been submitted in word-processed form. Course teachers handed a questionnaire to all students. The students gave their completed questionnaire to their class representatives who passed them to the teacher. These steps to preserve anonymity were taken in order to reassure the students that their responses to the survey questions could not affect the teachers' perception of them.

FINDINGS AND DISCUSSION

Effects of Collaboration on the Individual Student

Figure 1 shows that the majority of the students thought that they did acquire all six skills that members of a well-bonded team are likely to acquire in the course of collaborative work; namely, team building skills, organising skills, people skills, meeting skills, IT. skills, and work and project management skills.

Figure 1. Acquisition of Skills as a Result of Collaborative Work



Topping the list are team building (77%) and people skills (73%). These students perceived themselves as having clearly defined roles in the team, sharing responsibilities, encouraging participation, collaborating and working through differences. Taking responsibility and being accountable is a vital part of commitment, which facilitates accomplishment of the work of the group.

Brown (2000: 64) advocates that responsibility in an effective group be shared by the leader and members, and suggests that the behaviours and attitudes reflective of members who assume responsibility should have the following characteristics:

- Giving and receiving input.
- Willingness to participate in consensual decision making.

- Encouraging and modelling effective communication and relationship skills.
- Prompt completion of assignments and tasks.

This insight is reflected in the findings of this study. The majority of the students perceived that they acquired the necessary skills that an effective team needs for successful collaboration in group work.

Being able to listen attentively, communicate clearly, lead, coach, negotiate, present to groups, troubleshoot conflicts and resolve conflicts are people skills that 73% of the student participants claimed to have acquired through collaboration. At the core of people skills is interpersonal relationship. Indeed, when members are able to take responsibility for their actions and feelings, respect other group members and their rights to differing opinions, engage in active listening and responding skills, and commit to establishing "win-win" situations, fewer conflicts should arise and those that do should be easily resolved.

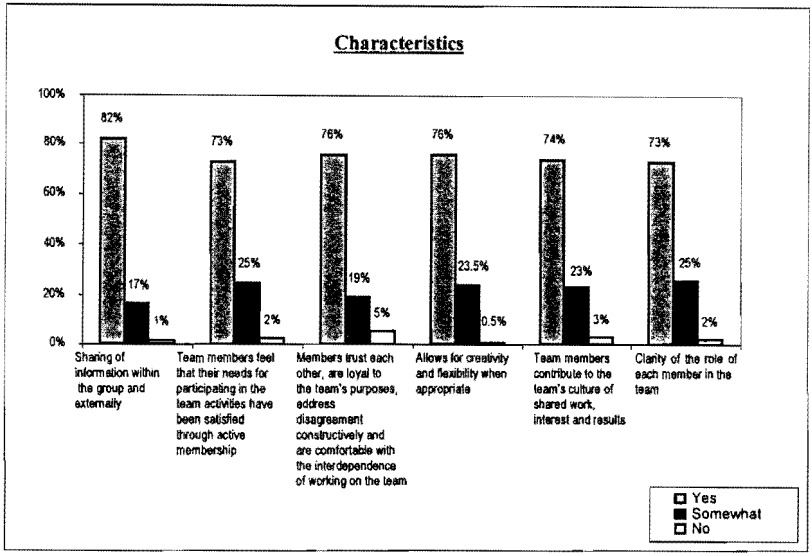
These findings are both interesting and exciting as one of the most important things a student can ever learn is how to be an effective team player. This collaborative experience that the course provided is vital preparation for the workplace, where many tasks are done in groups.

Effects of Collaboration on Group Work

Besides making a positive impact on the individual student, collaboration builds integration and oneness within a team. A fully integrated team possesses characteristics that are peculiar to an effective, fully integrated team. Researchers (Brown, 2000; D. W. Johnson & F. P. Johnson, 1997; D. W. Johnson & R. T. Johnson, 1991) are convinced that effective teams possess and manifest characteristics such as clearly defined goals; shared responsibilities, active interaction among members, commitment, cohesiveness and high achievement goals.

Student participants were asked to respond with either "yes", "somewhat" or "no" to the acquisition of effective team characteristics. The six characteristics that scored above 70% of "Yes" responses are presented in Figure 2.

Figure 2. Students' Perception of the Effectiveness and Integration of their Project Group Based on the Characteristics of an Effective, Fully Integrated Team



The data reflected in Figure 2 indicates that the majority of the student participants perceived their teams to be effective and fully integrated. It is significant to note that the majority vote was given to "Yes" for every listed characteristic (Appendix 3). Three characteristics had the highest scores: (i) sharing of information within the group and externally; (ii) allows for creativity and flexibility when appropriate; (iii) members trust each other, are loyal to the team's purposes, address disagreements constructively and are comfortable with the interdependence of working on the team. There was sharing of information within as well as outside the group (82%). Members trusted each other, were loyal to the team's purposes, addressed disagreements constructively and were comfortable with the interdependence of working on the team. As a result, members allowed for creativity and flexibility when appropriate (76%). Although the twelve characteristics for effective and fully integrated teams are not all inclusive, they are more than adequate in facilitating group development and producing more satisfaction for team members. This finding suggests strongly that the project teams were faring well.

In the same vein, D. W. Johnson and R. T. Johnson (1991) claim that being part of an effective learning group has been found to be related to a high subjective probability of academic success and continuing motivation for further learning.

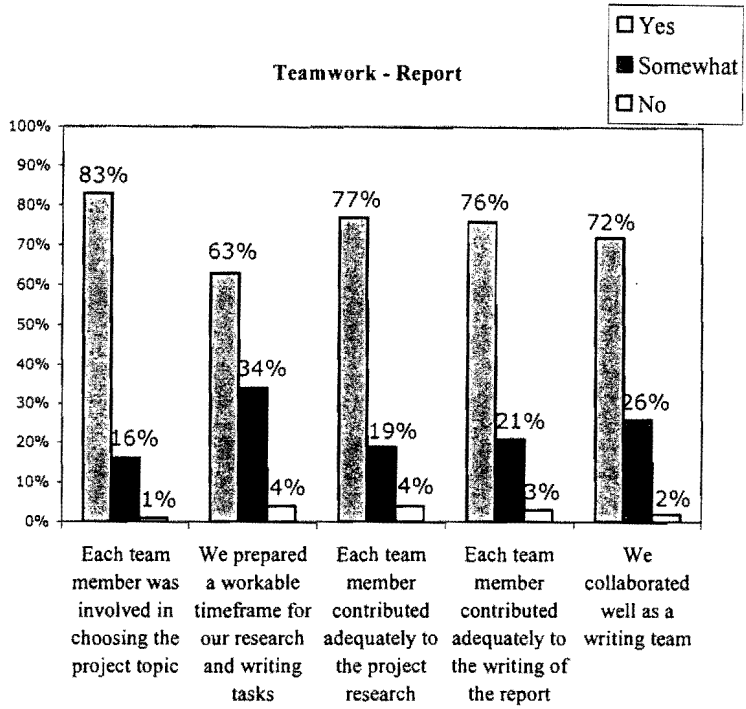
Besides, cohesive groups are further characterised by mutual respect and caring among members, cooperation and productivity. This accounts for the observation that team members of many project groups had developed deep and meaningful friendships by the end of the course. It was also noticed that many of these groups remained intact as a team when they worked on other assignments prescribed by other modules. It is likely that a sense of belonging to the team had been developed and this promoted and enhanced collaboration. From this study it appears that collaboration had a positive impact on the quality of group work.

Students' Reactions to Teamwork: Collaboration in Preparing the Report

The vital importance of writing in a collaborative learning process has already been documented by Bruffee (1999). Collaborative writing formed an important part of EG1412 and forced students to discuss tasks, formulate approaches, make decisions and share responsibilities. The hypothesis was that if students were engaged in articulating their thought processes to one another, they would gain a deeper understanding of the project ahead of them, coalesce as a working team and ultimately have a good learning outcome. In order to gain some insight into the levels of collaboration that took place during the various stages of report writing every student was asked to respond with either "yes", "somewhat" or "no" to the following five statements (Appendix 4):

1. Each team member was involved in choosing the project topic.
2. We prepared a workable time frame for our research and writing tasks.
3. Each team member contributed adequately to the project research.
4. Each team member contributed adequately to the writing of the report.
5. We collaborated well as a writing team.

Figure 3. Teamwork – Preparing the Report



These responses show that the large majority of students managed to achieve high levels of collaboration within their teams right from the beginning of the course, when their first task was to choose a project topic. As some students were not present at the beginning of the course or switched teams early in the course, the authors of this study believe that the 1% of respondents who indicated that they were not involved in the choice of their team's topic were mainly those who joined their teams late.

The relatively lower "yes" responses to the second statement indicate that time management can become a problem for students who do extensive semester-long projects, mainly because the timeframe is initially so deceptive. The students seemed to have the impression that twelve weeks is a very long time to complete their project and, therefore, few of them felt any urgency to put in a lot of work in the first few weeks. This relaxed approach to the early

part of the course became apparent in conversations teachers had with student teams during the first few tutorials.

The high percentage of "yes" responses to the last three statements shows that a large majority of students felt they were able to endorse their team activities. While this result was pleasing for the designers of the EG1412 course, it is worth discovering the reasons behind the students' satisfaction with their own team. What are the mechanics of a good writing team? How did they divide their tasks? The next section of the survey asked students to describe their methods of work allocation.

Methods of Work Allocation

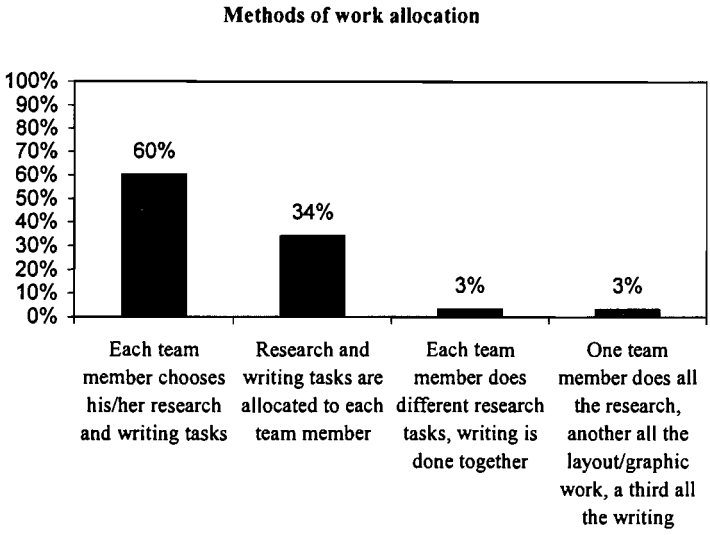
In response to the prompt in the survey, "Describe how you shared your writing tasks", the students described how they allocated the work that needed to be done in order to produce the report. It was explained to the students that 'writing tasks' referred not only to the physical act of writing the report, but to the entire process of producing the report. The student responses to the above prompt revealed that there seemed to be four main methods of work allocation.

Method 1

The majority of the students (60%) stated that within their teams, they initially identified the research tasks ahead of them and then let each team member choose those tasks they felt most comfortable with. The students then opted for writing up those parts of the report that they were already familiar with because of the research they did. This was the most widely adopted method of work sharing.

The advantage of this approach is that it speeds up the writing process and every team member has equal amount of responsibility in the report. The authors found that questionnaires in which this type of work allocation was described tended to have high ratings for the statement, "We collaborated well as a writing team".

Figure 4. Methods of Work Allocation



Method 2

About a third of the students (34%) indicated that they relied on their team leader to allocate the research and writing tasks to each team member. This approach worked quite well also and students in such teams declared themselves satisfied with the level of collaboration achieved. Their responses to the statement, "We collaborated well as a writing team", were generally good.

Although the design of this study did not allow for a matching of individual teams with the survey results, conversations with student teams throughout the term indicated that some teams clearly had a dominant leader whom the other team members deferred to. From these conversations the authors also gained the impression that the leaders of such teams may have been perceived by the rest of the team members as having superior language skills. Thus, it would appear that in an ESL learning environment a high level of language ability is a crucial factor in taking leadership in collaborative learning.

Method 3

A small number of students (3%) indicated that in their teams, they shared out the research tasks but did all the writing together. Comments in their questionnaires revealed that one reason for adopting this strategy was that the students wanted a report written in a unified tone and style and doing everything together seemed to be most effective in achieving this result. This response will need further investigation to find out if this type of report and team writing were more effective than individual work in achieving appropriate tone and style. Further response showed that the students did not want to have a lot of editing and compiling to do once they had finished writing. This behaviour is not unexpected as undergraduates in the Engineering faculty are swamped with numerous projects and would find ways to minimise work in order to concentrate more on engineering project tasks.

Of course, the downside of this approach is that it is very time-consuming during the writing phase, because a significant number of meetings are required to get the report done. Ratings for "We collaborated well as a writing team" remained good.

Method 4

An equally small number of students (3%), however, stated that in their teams, they decided that one person should do all the writing, another all the graphics and yet another all the research, for example. This approach appeared to be the least successful of all types of work allocation. Questionnaires, which indicated this type of work division, had lower ratings for "We collaborated well as a writing team". Comments on the questionnaires also revealed dissatisfaction with the amount of work that had to be done. Two respondents described themselves as stressed, because they saw themselves as solely responsible for a more demanding task like all the research or all the writing. Resentment of perceived "freeloaders", i.e., those who seemed to have less to do, was also mentioned.

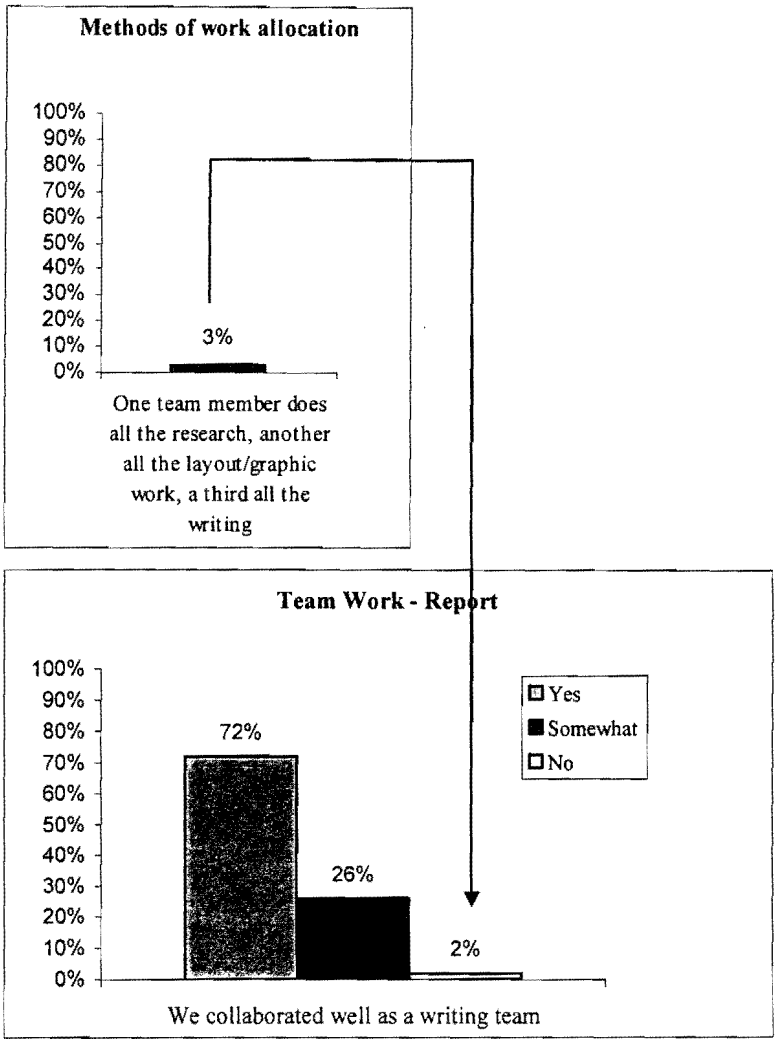
The authors of this study suggest that students might have chosen this type of work allocation because it seemed to present them with some distinct advantages. Firstly, there would be periods during the semester when an individual student has little to do,

because his or her work was either already completed or had not yet started. Secondly, students probably also reasoned that the one-writer approach would ensure cohesion for the report. Thirdly, some students might have felt insecure about their writing skills and wanted to minimise the amount of writing they would have to do.

Although it is recognised that efficient work division alone is not enough to achieve good collaboration in a team (Teasley & Roschelle, 1993) inefficient work division does seem to have an impact on the individual team members' perception of the collaborative quality of their teams.

Overall, however, the survey results revealed that the majority of teams shared out the work equitably, so that all team members were actively involved in every stage of the preparation of this report. This, in turn, led to the perception that the team members achieved good levels of collaboration.

Figure 5. Relationship between Method 4 of Work Allocation and Perceived Quality of Collaboration

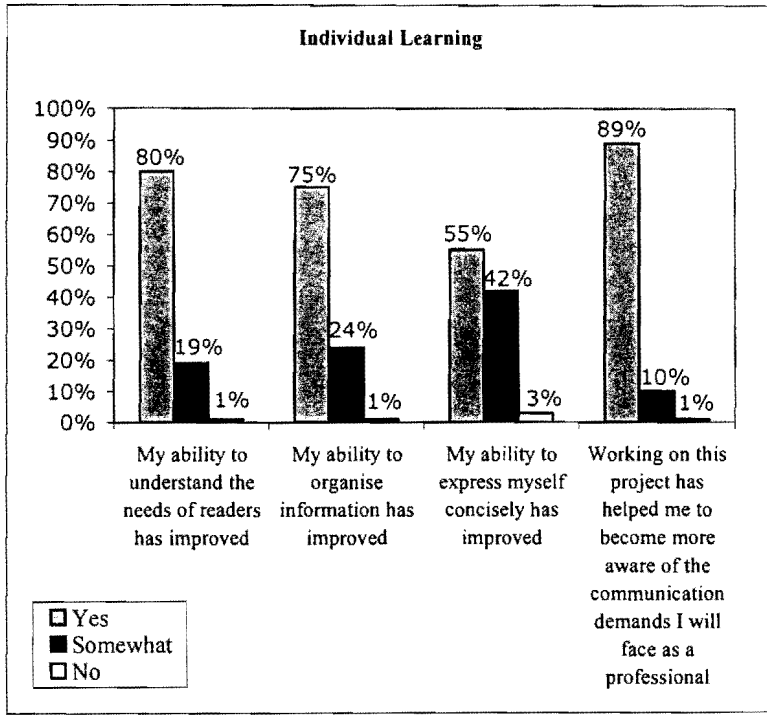


Individual Learning

Students also rated their own learning achieved during the process of producing the report. They were asked to respond with "yes", "somewhat" or "no" to the following four statements (Appendix 4):

1. My ability to understand the needs of readers has improved.
2. My ability to organise information has improved.
3. My ability to express myself concisely has improved.
4. Working on this project has helped me to become more aware of the communication demands I will face as a professional.

Figure 6. Individual Learning



These findings show that the vast majority of students gave high ratings for statement 1, 2 and 4, which means that the teamwork approach used to convey communication concepts is workable and can yield good results. The relatively lower ratings for statement three are probably due to the fact that linguistically weaker students needed more English proficiency support than the structure of EG1412 was able to deliver.

IMPLICATIONS OF STUDY

Whilst the study is case specific, the results bear pedagogical and research implications. The findings of this study are relevant for the design of future communication skills courses and approaches the teacher might take in order to maximise student learning. Some considerations arising from this study, however, can only be addressed by further research.

Time Management

The type of work division described in *Method 4* did not lend itself to easy time management, because it seemed to be difficult for students to estimate initially how long it would take them to complete a major task such as doing all the research or all the writing for the report. Also, this type of work allocation creates a lot of interdependence among the team members, for example, the writer has to wait for information from the researcher. If the researcher is slow for some reason, the writer in turn would also be held up. It is recognised, however, that good time management is vital for the successful completion of collaborative projects (Paradis & Zimmerman, 1997).

If the collaborative project the students are undertaking stretches over the entire semester, teacher intervention at the planning stage of the project can make a big difference to the eventual outcome of the project and also to the amount of satisfaction students gain from the course. Students should be helped to develop a realistic timeframe for the various tasks associated with their project.

In EG1412, teachers introduced students to a group working plan early in the course. This group working plan was developed to help students manage their project and encourage individual responsibility towards the team. A section of this group working plan was designed to assist students in planning their tasks and they were introduced to time management tools such as Gantt charts (Appendix 5) and, in some cases, software such as Microsoft Project. These Gantt charts, very similar in format to the programme plans mentioned by Paradis and Zimmerman (1997:

130), help substantially to reduce last minute panic attacks, sleepless nights and other manifestations of poor time management. In addition, time management tools familiarise students with workplace practices.

Work Allocation within Teams

The findings of this study show that the way the tasks of a collaborative project are divided influences student satisfaction with the team. It is likely that students who feel they have a stake in the overall project and are not taken advantage of by the other team members, also have a more positive attitude towards the learning experiences offered to them in a course with a strong teamwork component. Highlighting to the students the advantages and disadvantages of various methods of work allocation may enhance the benefits that students are getting from collaborative writing. The findings of this study show that every member of a team should be asked to participate in all the big tasks associated with the preparation of a report, particularly in research and writing. This shared effort leads to all team members experiencing a sense of ownership and responsibility for the report.

Monitoring of Collaborative Work

The "monitoring devices" that were used to monitor collaborative work seemed to have educational pay-offs for students. Through the conferencing sessions and the informal conversations between students and teachers, students revealed that the group working plan and evaluation sheet helped them to recognise and clarify the roles for themselves and members of their team. These documents also raised the quality of students' learning experiences by helping them to clarify their learning goals, and reflect on their learning and performance. Besides instilling a sense of personal responsibility and ownership of their learning, the oral group briefing provided students with an opportunity to consolidate and assess their and the team's collaborative efforts. This also provided the teachers with an opportunity to check on the progress of teamwork. The conferencing sessions with project teams were both revealing and enriching. The atmosphere at these sessions, although instructional, was relaxed and unintimidating.

When teams are formed in second- or third-year communication courses, it is easy to assume that because the students all know each other they should also be able to work together. However, this assumption may not always be correct and there are certain areas of teamwork, such as fair distribution of work and conflict resolution that could certainly benefit from appropriate teacher intervention. Throughout the term, EG1412 teachers had extensive conversations with the students to get feedback on the students' progress and/or difficulties, and to offer assistance when needed.

The study illustrates that in classroom teaching where group work is done, teachers need to strike a discerning balance between teacher supervision and team autonomy to advance effective learning. The students' positive perception of the effectiveness and integration of their project group (Appendix 3) suggests that the "monitoring devices" adopted in EG1412 worked well for the course and the students.

Further Research

It is acknowleged that the most serious difficulty in assessing project work is assessing the individual student's work which was done in a group. In an effort to address this difficulty, the weightage on individual performance in EG1412 was gradually increased from 40% to 50%. This was based on the rationale that a higher weightage allocated to individual assessment will provide for a better reflection of individual ability. The use of peer review and peer evaluation allowed all who were involved in setting up and participating in the group the opportunity to engage in assessment throughout the course. In addition, the continuous approach to assessment was adopted. Despite this concerted effort to assess the individual student's abilities more accurately, the teachers were aware that some students inevitably remained as "freeloaders" and others were marginally penalised by lower calibre team members. It would be exciting to explore the inherent complexities of assessing individual abilities when work is accomplished in a group, and the most effective and efficient models of assessment in a classroom with a high percentage of group work. Also, another interesting area to explore would be the probable impact of learner differences and preferred learning styles on collaborative learning.

Finally, investigation into the technical methods used by students to edit the final draft of their report could lead to valuable insights. Is it all done in meetings, or do they employ electronic means? Which are the most commonly used and how effective are they? Finding a suitable platform, which would reduce the frequency of meetings to edit the report, would be immensely helpful to students as many of them, particularly engineering students, are under constant time and work pressure.

CONCLUSION

Many course designers may hesitate to include group projects into their courses because of obvious potential difficulties of assessment. However, this study has shown that the positive learning advantages gained through collaborative work outweighed the potential difficulties of assessment. The construction, sharing, negotiation and re-construction of knowledge within a team resulted in effective and intelligent learning which was reflected in the much improved final draft of the team project and the quality of the teams' oral presentations. This finding corroborates Kolb's belief that "intelligent learning" is a result of thoughtful reflection on the observed consequences and experience of events (Kolb, 1984). However, a more positive conclusion could have been drawn if another study used non-collaborative work. A comparison of the two groups with different work style would yield more interesting results. This will form the incentive for future study.

On the whole, collaborative work was a valuable learning experience for the EG1412 students. In fact, 62% indicated that teamwork was one of the features of the course that they liked the best. A large percentage of students valued the collaborative learning experience offered to them in the teamwork approach of EG1412, but it was observed that the quality of this learning experience largely depended on the individual student and the team members. The study points to the probability that effective teams having effective classroom group characteristics as espoused by D. W. Johnson and R. T. Johnson (1991) and D. W. Johnson and F. P. Johnson (1997) could turn into high performance classroom groups. In view of this, collaborative learning seems to be a worthwhile option in structuring learning situations.

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Appendix 1. Group Working Plan

This plan should be completed and brought to every tutorial. At the end of term it should be initialled by all team members and handed in with the final report. In the course of working on the report you may need to add to or modify your working plan. Please use additional sheets.

1. State the topic your group has chosen and briefly describe the aim of your report:

2. Identify all the readers of your final report:

3. What will be your readers' most important questions? How/where will you address them in your report?

Reader questions	How / where are they addressed?

4. Identify one timeslot in the week, which is free for all team members, to allow for easy arrangement of any meeting that might become necessary:

5. Outline the tasks the group has to do together:

6. Make a style guide for your group to follow:
   For the text of your report, the line spacing should be 1.5 or 2 and the font size 12.

   - Specify the fonts you will use. As a general rule, you should not use more than two different fonts for your report.
   - Decide how to indicate the hierarchy of your headings, i.e. chapter headings and section headings
   - Decide how you will label your graphics
   - Determine if you want to use a header/ footer

The final report should show consistency in style and layout.

Font for text of report:

Font for headings:

Labels for graphics and tables:

Header/footer:

7. Name your team leader:

Keep a record of the individual tasks accomplished by each team member: This part of the Group Working Plan should be signed by every member at the end of the course.

1. Name
Tasks

2. Name
Tasks

3. Name
Tasks

4. Name
Tasks

8. Make a Gantt chart of the research and writing tasks your team has to accomplish in order to produce the final report (for deadlines, see the schedule in the handout).

Appendix 2. Individual Evaluation Sheet

Self evaluation: Team effectiveness

First evaluation (after the second tutorial):

Second evaluation (before handing in the final report):

Please indicate your responses to these areas (use additional sheets if necessary)

How satisfied are you with the team members' contribution at meetings?
How would you describe the way this team makes decisions?
How well does this team solve problems?
How effectively do team members work together?
What could be done to improve the effectiveness of meetings?
What would you do to make this team more effective?

Appendix 3. Table Reflecting Students' Responses to the Characteristics of an Effective, Fully Integrated Team

No.	Characteristic	Yes	Somewhat	No
1	Effective leadership	49%	44%	7%
2	Team members are committed to the team, its activities, and achievement of its objectives and goals.	69%	27%	4%
3	Team members feel that their needs for participating in the team activities have been satisfied through active membership.	73%	25%	2%
4	Team members contribute to the team's culture of shared work, interests and results.	74%	23%	3%
5	Members trust each other, are loyal to the team's purposes, address disagreements constructively and are comfortable with the interdependence of working on the team.	76%	19%	5%
6	Allows for creativity and flexibility when appropriate.	76%	23.5%	0.5%
7	Sharing of information within the group and externally.	82%	17%	1%
8	Good listening and questioning skills.	68%	30%	2%
9	Members are prepared to take risks, make mistakes and learn.	59%	37%	4%
10	Clarity of the role of each member in the team.	73%	25%	2%
11	There is a high degree of interaction and synergy in the team's work.	61%	35%	4%
12	The team is results-oriented and expects high individual and team performance.	58%	36%	6%

Appendix 4. The Questionnaire Used for the Study

TECHNICAL COMMUNICATION II (EG 1412)
End of Course Survey
21 – 26 October 2002

Please answer every question. Thank you.

Section A – Report

Collaborative writing is an important skill for every professional who is involved in project work. Based on your experience with your EG1412 writing team, please select the most appropriate response to each statement below.

Team:	Yes	Somewhat	No
1. Each team member was involved in choosing the project topic.			
2. We prepared a workable time frame for our research and writing tasks.			
3. Each team member contributed adequately to the project research.			
4. Each team member contributed adequately to the writing of the report.			
5. We cooperated well as a writing team.			
Individual:	Yes	Somewhat	No
6. My ability to understand the needs of readers has improved.			
7. My ability to organise information has improved.			
8. My ability to express myself concisely has improved.			
9. Working on this project has helped me to become more aware of the communication demands I will face as a professional.			

Describe how you shared your research and writing tasks.

What did you find most challenging about writing the report? Why?

What did you find easiest?

Section B – Teamwork

1. The following is a list of skills that members of a well-bonded team are likely to acquire in the course of collaborative work. Based on your experience with your EG1412 project group, please select the most appropriate response to each skill.

No.	Skills	Yes	Somewhat	No
1	**Team Building Skills** Definition of roles, sharing responsibility, encouraging participation, collaborating and working through differences.			
2	**Organising Skills** How to develop team goals, master plan, short term action plans and schedules.			
3	**People Skills** How to listen actively, communicate clearly, lead, coach, negotiate, present to groups, troubleshoot conflicts and resolve conflicts.			
4	**Meetings Skills** How to organise meetings, plan agendas, moderate discussion, generate ideas, make consensus decisions, close discussions and establish action items.			
5	**Supporting I.T.Tools** How to use I.T. tools to collect and analyse data, design charts/graphics and make continuous improvements.			
6	**Work and Project Management** How to coordinate efforts, measure quality, interface with stakeholders, monitor progress and document actions.			

2. Besides the listed skills above, if you have acquired other skills that might be useful to your academic pursuit or personal growth, please elaborate.

3. The following is a list of characteristics of an effective, fully integrated team. Based on your experience with your EG1412 project group, please select the most appropriate response to each characteristic. Please respond to every characteristic listed in the table.

No.	Characteristic	Yes	Somewhat	No
1	Effective leadership			
2	Team members are committed to the team, its activities, and achievement of its objectives and goals.			
3	Team members feel that their needs for participating in the team activities have been satisfied through active membership.			
4	Team members contribute to the team's culture of shared work, interests and results.			
5	Members trust each other, are loyal to the team's purposes, address disagreements constructively and are comfortable with the interdependence of working on the team.			
6	Allows for creativity and flexibility when appropriate.			
7	Sharing of information within the group and externally.			
8	Good listening and questioning skills.			
9	Members are prepared to take risks, make mistakes and learn.			
10	Clarity of the role of each member in the team.			
11	There is a high degree of interaction and synergy in the team's work.			
12	The team is results-oriented and expects high individual and team performance.			

4. What did you like most about EG1412? Please give reasons for your answer.

5. What did you like least about EG1412? Please give reasons for your answer.

Thank you for your time!

Appendix 5. Example of a Gantt Chart Presented by Students of EG1412

EG1412 Gantt Chart - Team 3

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Activity	1 -5 Jan	8-12 Jan	15-19 Jan	22-26 Jan	29-02 Feb	5-9 Feb	12-16 Feb	19-23 Feb
Team Formation		Team Formation	Divide tasks					
New Product Presentation			Preparation	Present-ation				
Market research				Surveys & Interviews				
Product research		Product information gathering						
Analysis					Analysis			
Draft 1					Begin writing	Submit	Conference	Revise Draft 1
Draft 2								Prepare 2 copies of Draft 2