CHAPTER 5

SUMMARY AND CONCLUSION

5.0 Introduction

This study focussed on the exploration of peer assessment on a selected mathematics group project at pre-university level. It attempted to investigate the problematic and complicated task in assessing the individual efforts within a group. Specifically, this study was designed to answer the following research questions:

(a) Is there a way to discriminate between the contribution of individual student within a group project?

(b) Is it appropriate to make process assessment of the group project as part of the peer assessment?

(c) What is an alternative method to reward individual effort in a group project?

(d) Is there any significant difference between the marks obtained by each student when the assessment was done with and without the incorporation of the peer assessment component?

The subjects of this study consisted of four groups of Pre-University students in a private college in Klang Valley. They were seven boys and nine girls. Each group comprised four students of mixed abilities. They had just completed their secondary

level education and had sat for SPM examination that is equivalent to O'level. Six of the students were interviewed to achieve better and more in-depth understanding of students' acceptance or reservation on the peer assessment.

Two instruments were used in this study. There were peer assessment form and evaluation questionnaires of the assessment. Both instruments were adapted from the study by Lopez and Chan (1999). The peer assessment form contains two part which are the peer assessment on the process of the assessment (within-group assessment) and the peer assessment on oral presentation (across-group assessment).

The data collected were analysed using descriptive statistics and qualitative approaches. The descriptive statistics involved frequency count and marks obtained by students (Peer assessment form). The data collected from the interviews was analysed qualitatively.

This chapter presents the major findings of this study, the implications of the findings, the suggestions for improvement and the recommendation for further research.

5.1 Summary and Discussion of the Findings

The findings of this study are summarised and discussed under the following headings:

5.1.1 Across-group Peer Assessment on Presentation

The comparison between the students' and teacher's rating were made. The peer's rating and teacher's rating were consistent for groups B and C. However, there were distinct disparity between the ratings given by students and teacher in groups A and D. Some of the previous studies (KegelFlom, 1975: Swason, Case and Van Der Vleuten, 1991) revealed not all the findings produced significant positive correlations between peer and teachers marks.

5.1.2 Within-group peer assessment- Process assessment

The marks for each individual were computed. There were distinctions between the marks obtained by each individual especially for members in groups A, B and C. The average marks obtained by each group were different too. The average mark for group A was 17.3%, group B was 20.8%, group C was 19.3% and group D was 21.1%. According to Boud (1989) and Falchikov (1986), some degree of student over-marking can occur.

5.1.3 The comparison of the overall scores of students with and without the component of peer assessment

With the incorporation of the peer assessment, the mark obtained by each individual could be discriminated. Contribution of each individual was reflected by the score he or she obtained. The average mark of each group was in direct relation to the marks given by teacher.

This view was further enhanced and shared by the students during the interview sessions. Most of the students interviewed agreed that with the inclusion of peer assessment especially considering the process of the project (within-group peer assessment). They believed that it would be able to discriminate the individual contribution in the group project and the marks obtained would be a fair indication of their efforts.

5.1.4 Evaluation on the Use of Peer Assessment in Oral Presentation (Across-group Assessment)

From the responses of the students to the various statements from strongly agree to strongly disagree, it showed that the responses skewed towards the agree or strongly agree. In many of the statements, the percentage of students who responded positively constituted from 80% to 94% except two statements on the sufficient opportunity for them to collect evidence on each person's achievement and the peer assessment make them a more effective presenter. The positive responses for these two statements were only 56% and 69% respectively. Nevertheless, the principle of peer assessment in presentation was well accepted.

During the interviews, the interviewees explained their reasons for the negative responses towards the use of peer assessment in presentation. They felt that they were incompetent in assessing their peers during the presentation especially on the content criterion. The time constraint was one of the main factors that deterred them from carrying the task. Most of them concluded that this part of the assessment should be done by teacher alone.

5.1.5 Evaluation on the Use of Peer Assessment in Group-work (Within-group Assessment)

There were 100% of the students responded positively (agree or strongly agree) to the three statements on the understanding of the purpose of the assessment, the assessment criteria and the increase of the involvement in the project. There was 25% of the students responded negatively (disagree or strongly disagree) on the statements of difficulty in recognising each criterion behaviour and whether the peer assessment had made them a more effective group worker. For the remaining of the statements, the responses were generally positive. There were between 80% to 94%.

The feedback on the evaluation questionnaires was quite consistent with the opinions expressed by the students during the interviews. Most of the interviewees felt that with the incorporation of peer assessment in the process of the group-work, they were more committed to work and involved in the project in order to achieve the goal. However, there was one out of six students interviewed revealed the difficulties in understanding of assessment criteria as compared to none of the students in the feedback questionnaires. This might indicated that students were more willing to share their thought during interviews.

5.1.6 Evaluation on the New Assessment System

There was 81% of the students responded positively (agree or strongly agree) to the use of peer assessment in oral presentation. However, in the interviews all six students did not professed such conviction but instead they suggested this part of

assessment should be done by teacher alone. For the appropriateness of the use of peer assessment for individual contribution in a group-work, the results from both the feedback questionnaires and interviews were consistent. The majority of the students were in support of the use of peer assessment in this area.

In the feedback questionnaire on the distribution of weighting in the three components: written project (product), oral presentation and group-work (process), the responses were more positive, showing that the principle of the weighting was well accepted. This was in contrast with the opinions expressed during the interviews. In the interviews, only one student was happy with the distribution of the weighting of the three components. Five of them felt that the weighting of the oral presentation should be lowered to 10% or below. The remaining 5% should be re-distributed to either the product or the process of the project.

On the overall perception of " peer assessment was a fair way of assessing student learning where group-work was emphasised", 81% of the responses in the feedback questionnaires were positive. These responses were reinforced during the interviews. In addition, during the interviews, most of them expressed that the maximum benefit of peer assessment in the group-work could only be achieved if the teacher play a more dominant role in facilitating and giving appropriate guidance. This was mainly due the their reservations on the reliability of peer assessment.

5.2 Implications of the Study

This study utilised peer assessment as part of the course evaluation which can be foreseen to be useful in this technological age. The success in achieving reliable

and valid outcomes from peer assessment requires the co-operation of students and teachers. The following implications are derived from the findings of this study that would assist in achieving the successful implementation of peer evaluation:

- Students must be committed to and understand fully the educational purpose of their involvement in assessment.
- Students need to be involved in the process of determining criteria, and in agreeing on a rating scales and marking procedures. The identification of criteria of assessment is the most important part of the process because for many students, it may be the first time that they encounter the peer assessment.
- Students need to receive feedback on peer assessment scores, both in relation to their own performance and to overall pattern of scores. Reliability scores cannot be enhanced progressively or even maintained if students are not given access to feedback with gauge how others assess their performance (Falchikov and Magin, 1997).

From the reservation expressed by the students, in particular on the assessment reliability, students therefore cannot reliably be used to help reduce the strain of marking for subjective assessment tasks unless further controls are implemented. Considerable care should be taken in introducing innovative forms of peer assessment that involve elements of subjectivity. Proper training and practice should be given to students in the art of peer assessment. Teachers should always play a more dominant role in the assessment, with students in a lesser portion (Conway et al., 1993).

Assessing the effectiveness of peer assessment is not a straight forward task. There are at least four different aspects, which contribute towards the overall effectiveness of this system of marking:

- Arriving at an appropriate mark
- Providing adequate written feedback for students on their peer assessment pieces of work
- Creating a speedy, efficient and easy to use system for submitting, marking and returning work
- Making sure that students learn as much as possible from the process of assessment

Besides students who need training in the peer assessment, teachers who intend to use the peer assessment need to be trained and well equipped with the process of assessment. They have to continuously improve, refine and be innovative in implementing the process of assessment. It is a time consuming process and it requires perseverance and endurance from both teachers and students if peer assessment is to be made as an effective way to assess students' learning in a group.

The final implication from the study is that social-loafing and free-riding are not inevitable in a group efforts. These phenomena often could be avoided if individual performances were identified, monitored and rewarded (Myers 1990). Therefore, for a more effective use of group projects in classroom, identification of individual efforts and equitable grading of individual based on their individual contribution to the group are essential. Peer assessment is one of the methodologies for identifying individual performances.

5.3 Recommendations for Further Research

The study has highlighted some of the practical considerations. This is the view of the researcher that much work has yet to be done in this area. The following areas are the potential working agenda for future research work:

- Evaluation of the reliability of the peer assessment process in a presentation context, a series of comparisons should use to test for significance differences between teacher and student scores. The following questions should be of interest to further study:
  a. Are there differences in the overall averages?
  b. Are there differences for different individual presentation?
  c. To reflect the relative expertise of the teachers and students in assessing the content and presentation components, are there significance differences in the separate marks for each of these components? Is there a significance correlation between teacher and students' marks across the range on marks such that the latter can be a reliable substitute?
- For the discrimination of individual contribution in a group-work, the question that should be of interest for future study is: "Is it reasonable that a group member can score much higher than the group mark simply because they put in more effort into it than their peers?"

5.4 Conclusion

This study was to explore the use of peer assessment in assessing students in a mathematics group project. It attempted to find out whether peer assessment could be used to discriminate the contribution and effort of individual student within a group. The study also focussed on the use of peer assessment in the process and the oral presentation of the projects. From the findings of the study, the researcher hopes to devise an appropriate method to reward individual effort in a group project.

In general, the findings of the study could be summarised as below:

- Students showed high degree of acceptance of the use of peer assessment in the mathematics group-work or group-projects particularly in the consideration of the process of the project, that is, the literature search, generate the problem statement of the project, data collection, writing up the results etc. The general acceptance of peer assessment by students has also been observed by Conway et al.(1993), Oldfield and MacAlpine (1995)and Lopez and Chan (1999).

- Students indicated reservation of the use of peer assessment in the oral presentation of the project due to lack of confidence and experience. Besides that, time constraints and difficulties in defining the criteria used were the reasons quoted for the reservations on peer assessment. The students did experience difficulty in assigning marks. This suggested that the lack of explicit assessment criteria could be the reason.

- The distinction of overall marks obtained by each member within the group as the results of peer assessment were well received by students. They found that it was a fair way to justify their contributions and efforts towards the group project.
- Deep learning did occur as most of the students felt that they had performed better as a result of participating in the peer assessment process and that it has exposed them to new ideas. This supports the view of Brown and Knight (1994) who stated that peer assessment gives the student ownership of the learning experience, that is a participative process rather than something that is 'done to them'. Peer assessment is therefore a valuable exercise in self-development and preparation for their future careers. Students felt that they were more critical, worked in a more structured way and found work more challenging.
- Positive suggestions to improve the assessment process emerged from the evaluations and interviews with students include :
    i. Relative weighting of peer assessment component in the overall ratings. The ratio of 2:3 or 1:4 (peer assessment: teacher assessment) were recommended.
    ii. Bench-marking the ratings used
    iii. Clear explanation of the assessment criteria and the implementation of the assessment process should be given to students prior to the project. Students should be encouraged to give any ideas, input or feedback on the assessment criteria.
    iv. Group formation- the size of three to four students and must be of mixed ability.

The subjects in this study may not be representative of students other than those selected in the study. However, it is believed that the findings would be of great guide and inspiration to the teachers and mathematics educators who wish to explore into the use of alternative assessment in mathematics group project or group-work.

In conclusion, this study is to explore and promote learning and assessment quality through the introduction of an innovative form of assessment. It is still too early to draw conclusion on the effectiveness of the new assessment system. Therefore, further research and refinement of the peer assessment have to be carried out in order to establish an acceptable and reliable assessment system.