CHAPTER 1

INTRODUCTION

1.0 Introduction

Group-work or cooperative group-work has become one of the effective ways in instructional teaching and learning at all levels of education. Positive effects on achievement have been anticipated because students are likely to encourage and help each other to learn in a cooperative group. In addition, positive effects on social relationships, such as improved race relations and attitudes toward academically handicapped classmates, are also expected. It is because cooperative learning creates the conditions of non-superficial and cooperative contact which have long believed to improve relationships across such boundaries as race or ethnicity (Robert, 1990). There are many reasons and benefits that the group-work is promoted in educational sector. Among these are the socializing value of working cooperatively with other members within a group, sharing of ideas, justifying and defending one's own view, criticising other's views, producing an agreed product, presenting a product to other groups and learning from the product of other groups (Lopez-Real; Chan, 1999).
The general aim of education is to produce students who have special skills such as accepting responsibilities for their own learning, development and who have experience of working as part of group. Student's maturity development is increasingly recognized as being closely linked to their ability to be an effective member of a team (Jacques, 1984). In light of increased teacher-students ratio, group-work has been a pragmatic response.

In order to achieve competence in group-work, it is self-evident that student should be exposed to working in groups. Often, working in a group involves an element of peer review that helps individuals within the group to learn about their effectiveness in a group setting. This is a useful learning experience for the students. Mello (1993) supported group-work and cited five benefits of working and being assessed in small groups. These benefits are:

(a) Students gain insight into group dynamics.
(b) Group assessment allows the development of more comprehensive assignment
(c) Group assignment develop students' interpersonal skills
(d) Students are exposed to other points of view.
(e) Students are prepared for the real world.

However, converting the effectiveness of an individual contribution to a group into a numeric grade is a complicated and problematic task. Assessment inevitably is an integral part of the process of the group-work. The implementation of the assessment in group-work is a challenging task.

For students, assessment is the crucial component of an educational experience that could have a lasting effect on their future careers (Searby, Mike; 1997).
Assessment is also one of the aspects of the educational experience that many teachers feel most sensitive about as it is the area that they inevitably yield power over students. Changes in assessment from a traditional and authoritarian approach to a more progressive method may meet with resistance from students and teachers, particularly if there is a change in the balance of power between two parties. However, the educator of current educational systems should provide a balance between traditional and innovative or alternative assessment. Peer assessment is one of the alternative assessment that educators can incorporate into their assessment and evaluation component especially with group projects and presentation. Nevertheless, peer assessment is also one of the alternative assessments that can cause resistance. The resistance is caused partly by the shift in responsibility from the teacher to the student leading to a greater democracy within the educational community.

Participation in peer assessment was found to involve students in a recursive, self-referential learning process that supports the explicit development of meta-cognitive skills (Howard & Sonia, 1994). Therefore, peer assessment helps students to think critically and to take control of their learning so that they are less dependent on the teacher. This view is supported by Oldfeild and MacAlpine (1995) which stated that

"As part of education for life, peer assessment can also assist in the essential task of allowing students to become self-learners, a measure of the quality of the educational program they are undertaking".

(p.129)
This is in line with the aim of *Kurikulum Bersepatu Sekolah Menengah* (KBSM) Mathematics programme to develop logical thinking, analytical, systematic and critical thinking so that the individual is able to function efficiently and responsibly in daily life. It also asserts that learning of Mathematics should be challenging and enjoyable experience for all students (Curriculum Development Center, 1988).

With these frameworks in mind, the underpinning aims of the present study are to:

- Involve students and give them responsibility in every aspect of their work including assessment.
- Stress the formative and reflective aspects of the assessment.
- Build students' confidence through their active involvement.
- Provide students with a sense of ownership and control of the whole assessment process.

1.1 Purpose of The Study

The group project has been used and become popular as an essential mode of teaching and learning mathematics at all levels (Robert, 1990). It is a significant element of the course assessment for Mathematics course at a Canadian Pre-University programme in particular. Students always find group projects interesting and more effective than lecture style for some of the aspects of Mathematics. However, the only negative element of the students' feedback concerns the fairness of the assessment. In response to an open-ended question, some students usually commended upon the equity of awarding same mark to all group members. The unequal distribution of
workload among teammates is always an issue. It is resulted from some non-cooperative group members. During the group-work, if members of a group are not cooperative, one or other students have to shoulder the workload and may be too great to support. The preparation of the work takes time and requires compromise between teammates. From the feedback and some dissent arose from students, this study was planned and carried out to explore the use of peer assessment for a Mathematics project in addressing the following issues:

(a) Discriminating between individual contributions in the assessment of a group project.

(b) Providing some validity of peer assessment in the content of group presentation and group project.

(c) Providing an alternative method to award individual mark which is a reflection of individual student’s effort for group project.

1.2 Statement of the Problem

This study is concerned with the assessment in Mathematics group projects. It attempts to investigate the problematic and complicated task in assessing the individual within a group. The major objectives are:

(a) To investigate whether it is possible to discriminate between the contributions of individual students within a group project.

(b) To investigate a method for rewarding a project which reflects both the outcome of the project and contribution of the group members to work (product and process).

(c) To implement and evaluate the method of peer assessment.
(d) To compare the marks obtained by individual student for a group project with respect to assessment done with and without the peer assessment component.

1.3 Research Questions

Based on the aims of the study, the following research questions are addressed:

(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?

1.4 Operational Definitions

This study uses the following terms with their operational definitions which are adapted from previous researchers as indicated.

Assessment

Assessment is the collection of data on students' progress that includes results of quizzes, test, examinations, homework checks, major and minor projects, group work (King and Ranallo, 1992).
Peer Assessment

Peer assessment refers to students assess each others work and give written feedback for their peers’ work. These include how to give and receive criticism and advice positively (King and Ranallo, 1992).

Product Assessment

Product assessment refers to assessing the end product of projects and product contribution by individual. The assessment is based on the written report of the project (Lopez and Chan, 1999).

Process assessment

Process assessment refers to assessing the involvement and contribution of students to the process of the project (Lopez and Chan, 1999).

Group-work or Cooperative Work

Group-work or cooperative learning is defined as students work together in a small group of four persons to learn and are responsible for their teammates’ learning as well as their own. They share their responsibilities to achieve a common goal (Robert Slavin, 1990).

1.5 Significance of Study

The benefits of cooperative learning are widely recognized (Johnson and Johnson 1988). Many learning environments especially in Mathematics education
requires students to undertake collaborative project work in a small group. In view of
the importance of the cooperative learning in the present educational system, a better
system of assessment such as alternative assessment has to be investigated.

The issues of teachers’ assessment of individual contribution to group processes
have yet to be addressed. Many recent case studies have reported that collaborative
group project work has included peer assessment of individual contribution to group
process as a summative assessment component (Conway, Kember, Sivan & Wu, 1993;
Freeman, 1995; Goldfinch, 1994).

This study attempted to develop and design a method for peer assessment. The
findings of the study would provide some food of thoughts to Mathematics educators
for consideration of incorporating peer assessment in group work in this information
technology age. It was also part of an action learning project undertaken to promote
learning and assessment quality through the introduction of an innovative form of
assessment in this Canadian Pre-University Programme.

1.6 Limitations

This study was carried out on a sample of sixteen students in a private college
in Klang Valley. The sample taken was small and confined to a specific class and
college. It might not be the representative of the pre-university students in Malaysia.
Therefore the findings of the study may not be generalized for all pre-university
programme in Malaysia.
Besides, the procedure employed in this study is a time consuming procedure. The students involved in this study had to spend time together with the researcher for a period of one month to complete a Mathematics project, for conducting the assessment process and individual interviews. The interviews had to be carried out as soon as possible after the return of the assessed project and also the completion of the students' evaluation. Due to the time constraint, only six students were interviewed. The views of all the students involved in the study could not be investigated comprehensively. Thus, it will not be appropriate to generalize the views and opinions that were being expressed. Nevertheless, the findings do provide valuable food of thought to Mathematics evaluation as a whole. Any interpretation of the findings in this study should take precaution of the simple system involved.