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Influence of Peer Assessment on the Quality of Cooperative Learning: A Pilot Study

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Introduction

The Ministry of Education (MOE), Singapore, is continuously introducing changes in the way students learn in schools. The aims are to engage students in the learning process and to make them more responsible for their own learning. Besides assessing the product or outcome of students' learning, the Ministry is now shifting its attention to monitoring and assessing learning processes of the students. To be in line with the changes in the Singapore education system as well as to meet the new initiatives introduced by MOE in schools, teacher education in the National Institute of Education (NIE), Singapore, is also undergoing various changes in the area of curriculum and assessment. The changes in the curriculum and assessment modes are a move towards providing student teachers with the opportunity and autonomy to take greater responsibility for their learning. In addition to these on-going changes, the authors of this report feel that there should be changes in the way student teachers learn in the Institute to ensure that they have first-hand experience in learning skills, which they can impart when they are in schools as educators. As such, a cooperative learning approach with peer assessment was introduced into the elective module that the authors were teaching.

Benefits of Cooperative Learning

There are many potential benefits of introducing cooperative learning. Some of them are outlined below:

- Cooperative learning helps to develop students' interpersonal skills (Slavin, 1987) such as getting to know and trust team members, communicating

effectively and clearly, providing support and challenging fellow team members and engaging in constructive conflict resolution (Johnson and Johnson, 1994). In addition, these social skills may help students to acquire a sense of social responsibility (Vermette, 1988).

- Beneficial in a multiracial society, as in Singapore, where findings by Pate (1988) suggest that people of different ethnic backgrounds working together on a task, problem or goal, develop positive feelings as well as mutual respect for each other. This would serve well in the long run to promote positive feelings and better understanding among the students from the different ethnic groups.
- In general terms, a cooperative learning environment can provide a positive impact on student achievement (Ream, 1990).
- Under specific circumstances, cooperative groups can obtain significantly higher achievement scores as compared to individuals (Sherman and Thomas, 1986). They can also learn materials more effectively (Yager, Johnson and Johnson, 1985).
- The experience of being in a cooperative group can also give rise to a feeling of having achieved success, which in turn enhances self-esteem. Thus, students have been found to look forward to coming to school and meeting their group (Slavin, 1980; Slavin, Sharan, Kagan, Hertz-Lazarowitz, Webb and Schmuck, 1985).
- Students become active learners who want to contribute and discuss ideas with the teachers (Davidson and O'Leary, 1990).
- Students in a cooperative group assist each other to stay on task by discussing the problems that other members in the group are facing (Johnson and Johnson, 1981; Salend and Sonnenschein, 1989).
- Cooperative learning gives rise to higher order thinking among students (Slavin, 1987) because the students need to re-organize their thoughts and explain to the other team members.

Some Setbacks to Introducing Cooperative Learning

Although significant benefits arise from incorporating cooperative learning, there are also potential negative outcomes. Some of the negative effects are dysfunctional groups, inability to work together to deliver desired outcomes of the task, as well as a lack of democracy within groups to form a consensus as to how the task should be carried out (Beckman, 1990).

Johnson and Johnson (1999) identify the following factors as hindering group effectiveness and the introduction of cooperative learning in the classroom.

1. *Lack of group maturity* where the members need time and experience to form a cohesive working group.
2. *Uncritically giving one's dominant response* can be a barrier to higher-level reasoning and deeper-level understanding.
3. *Social loafing—hiding in the crowd* happens when individual members reduce their contribution without the rest of the members realizing it.
4. *Free-riding* is when a group member does nothing but enjoys the benefits of the group work.
5. *Motivation losses due to perceived inequity* and the members who are working will reduce their effort in order to make sure that the free-riders within the group do not benefit from the effort they have put in.
6. *Groupthink* happens when the group starts thinking alike just for the sake of avoiding conflicts to reduce vulnerability in the light of the other groups.
7. *Lack of heterogeneity* works against the group's performance as the group may lack a variety of skills among team members to optimize their skills.
8. *Lack of teamwork skills* can work against the team members' ability to work effectively.
9. *Inappropriate group size*, especially large group size, limits the contribution of each member and makes the group structure complex.

However, in view of the many advantages cited by researchers, there is now a strong movement to use cooperative learning in education. At NIE, more and more courses engage students in cooperative learning tasks. The authors also use cooperative learning strategies in the delivery of their courses.

Peer Assessment in Cooperative Learning

Research also cites many benefits of peer assessment which involves coursemates assessing the contribution of each other towards a learning task. Some of the benefits would be that peer assessment enhances the development of critical faculties (Searby and Ewers, 1997; Stainer, 1997); promotes students' learning and encourages cooperative learning as opposed to competitive

learning (Orsmond, Merry and Reiling, 1996; Lejk and Wyvill, 2001). The perception of students engaged in cooperative learning using peer assessment indicated that it had encouraged them to participate actively and that it was an interesting experience (Lourdusamy and Divaharan, 2000). In fact, the students expect their peers to take the group activity seriously and thus develop trust in their group members, in addition to the rewarding experience of cooperative learning with peer assessment (Purchase, 2000).

One of the concerns of introducing cooperative group-work in institutes of higher education or in schools is the students' concern for the level of fairness of assessment as all group members are generally awarded the same mark (Conway, Kember, Sivan and Wu, 1993). In addition, Johnson and Johnson (1999) highlight that the most significant motivating forces for students are those that increase their competencies in a way that benefits those that they care about. This can be encouraged by (i) structuring positive interdependence among students; (ii) involving students in the learning and assessment processes; and (iii) ensuring that the assessment procedure is organized in a way that the data collected may be used for final grading. This is an issue that needs to be addressed to ensure that members of a group are rewarded fairly based on their contribution instead of being free-riders and getting rewarded for the efforts put in by other team members.

One way of ensuring student involvement is by rewarding their participation and contribution (Yueh and Alessi, 1988). Taking this into consideration, the authors decided to include peer assessment to reward the students for their effort. Besides being rewarding, the authors agree with Conway *et al.* (1993), Goldfinch (1994), and Freeman (1995) that peer assessment is one way of controlling free-riders in group-related assessment task. On the other hand, it has been found that peer assessment gives rise to students feeling discomfort as they perceived it as criticizing their friends (William, 1992). Students in William's experiment suggested that the situation could be improved by providing streamlined marking guidelines.

In summary, Falchikov (1995), Keaten and Richardson (1993), and Pond, Ul-Haq and Wade (1995) claim that there are a number of advantages to introducing peer assessment. They are:

1. the students are motivated and accountable for doing group task before class;

2. peer assessment raises awareness of the importance of group dynamics;
3. peer assessment also reduces the presence of free-rider members within groups considerably.

The decision to go ahead and introduce peer assessment for cooperative learning tasks also stems from the fact that people like to be recognized for their achievements, a fact which Yueh and Alessi (1988) claim can help foster self-esteem. Student teachers need to know that each of them, in their own unique way, can contribute to the success of the group. This would help the student teachers realize their potential. The authors considered this suggestion in the design of the intra-group peer assessment and this was implemented for the student teachers for this elective module at NIE.

Method

It was noticed by the authors during the previous teaching of the module that the participation of student teachers in cooperative group-tutorial work varied as some put in a lot of effort while others did the minimum judged by their participation in class as well as through our personal interaction with the student teachers. The success element of cooperative group work depends on positive interdependence and individual accountability. For positive interdependence, there must be awareness among group members that their success is linked to that of others. For individual accountability, each group member has to be accountable to do his/her part and help others complete the group task successfully.

Therefore, it was decided for the module that the authors were teaching, the student teachers would be assessed for participation in tutorial preparation and presentation. Using this approach, the authors hoped to engage the student teachers fully in the tutorial activities. The authors also decided to involve the student teachers in the assessment process for both the group presentations (inter-group product evaluation) as well as the contribution of fellow group members to the success of the group's work (intra-group process evaluation). This is based on the assumption that since they know what each group member has done and contributed to the task, they are in the best position to assess. This procedure is a departure from the norm in assessment practices at NIE where students are not involved in assessing peers' work. Though this procedure is quite widely

practised in North America and Europe, we were not very sure how our students would receive it.

The aim of this exercise was to find out whether the introduction of peer assessment improved the quality of participation in cooperative learning. This was assessed by the perceptions of the trainee teachers in this course.

Procedure

Sixty-nine Post-Graduate Diploma in Education (PGDE) students who enrolled for the elective module "Instructional Strategies and Learning Effectiveness" participated in this exercise. The PGDE is a 1-year professional training programme.

At the beginning of the course, the authors briefed the students on the procedure for peer assessment with respect to the cooperative work they would be doing for the tutorials. They were also told that only 20% of the course assessment marks would be involved in this process. The rest of the assessment would be normal essay assignments evaluated by their tutors. Their consent was obtained and the student teachers indicated willingness to try and provide feedback.

For this exercise the students were divided into sub-groups of five in the tutorial groups. They were allowed to form their own groups. The rationale for this is, on some occasions, they were also required to meet outside class hours to prepare for the tutorial. They were assigned five tutorial tasks that were related to the theoretical input in lectures. The student teachers were required to work in their groups to prepare for class presentations on the assigned tasks.

Two forms of peer assessment were operational during the tutorial presentation. First, the other groups assessed each group's presentation (inter-group product evaluation) based on evaluation criteria for each task. The tutor also evaluated the presentations independently. The correlation between the tutors' scores and the mean peer groups' scores was examined by calculating the Pearson correlation coefficient. There is a fairly high correlation between the two sets of marks ($r = 0.78$) in a previous study, significant at the 0.001 level. (Lourdusamy and Divaharan, 2000). Second, students assessed the contribution of their group members towards the tutorial task collectively through negotiation (intra-group process evaluation). An

assessment guide and a scoring rubric were provided for this purpose (see Appendix).

At the end of the course the score sheets of the groups were collected and the mark for each student was computed. The students were also asked to express their views and feelings about the peer assessment exercise on a specially prepared form. They did not relate this in any way to the course assessment but expressed their views about their experiences with this procedure. The students were aware that their comments may be used by their tutors for publication purposes.

Data Analysis

The views expressed in the feedback forms were analyzed qualitatively to get an impression of the student teachers' experience with peer assessment and the effect of peer assessment on the quality of their participation in cooperative work by examining the comments made by student teachers.

Results and Discussion

All views expressed here are based on the qualitative feedback obtained from the student teachers who participated in the study. In general, the authors found that the student teachers were positive about cooperative group-work for tutorial tasks and the use of peer assessment as a monitoring strategy. The views indicated that peer assessment helped to encourage and accentuate the benefits of cooperative group work for the students involved in this study. Students perceived the task of assessing the group presentations of their peers as interesting, acceptable and a task in which they would like to be involved in. However, they also found the task difficult and sometimes felt awkward when they had to judge the performance of their peers. This resonates with William's (1992) study. A number of student teachers suggested that intra-group peer assessment of contributions from fellow group members should be done in confidence and not openly.

On the whole, students' views were positive. Student teachers felt that peer assessment had motivated them to work better in their groups. In addition, it provided them with a sense of achievement as well as to be more responsible for their own learning, thereby developing further their higher-order thinking skills by being more critical of themselves and their peers.

Some student teachers found it to be a fair system of assessment. They felt that the system encouraged them to work cooperatively and helped to improve interpersonal skills. It helped them to stay focused on the common goal set by the group members and to stay on task.

Conclusion

The aim of this study was to assess the influence of peer assessment as a means to improve the quality of participation in cooperative learning. The views expressed by the student teachers indicate that their involvement in peer assessment encouraged them to participate actively in the tutorial activities. Also, student teachers perceived peer assessment of group presentations as non-threatening, interesting and acceptable. However, the trainee teachers found participating in the assessment of fellow group members in the face-to-face intra-group assessment of their peers awkward. They felt that they were restricted in a face-to-face situation to give unbiased assessment.

With the introduction of cooperative learning together with peer assessment, the student teachers perceived that they had developed several learning skills. Their perceptions and views suggest that they were able to develop their communication skills with their group members by providing support as well as challenging their team members to realize their potential. In addition, the students felt a sense of responsibility working in a group. With cooperative learning, the trainee teachers felt that they were able to set common goals and to be on task through the help of fellow group members who reminded each other of the target goal.

As mentioned earlier, the authors would like to point out that this is not a rigorously designed experimental study but a report of an attempt by the authors to introduce peer assessment in a context where it is not normal practice. Our experience with peer assessment for cooperative work suggests that it encouraged student teachers' participation and the quality of work presented in the class. A carefully designed study may throw more light onto the usefulness of peer assessment to enhance the participation and quality of involvement in cooperative work with wider empirical evidence.

Implications

- Cooperative learning can be encouraged through a system of rewarding students for their participation and contribution. One way this can be achieved is through peer assessment.
- Peer assessment motivates students and makes them more accountable for their contributions to group work. In addition to raising awareness of group dynamics, it reduces the presence of free-rider members within groups. The findings reported in this article suggest possible applications in secondary schools, Junior Colleges and higher learning institutes, where students are mature enough to take responsibility for their own learning.
- It is suggested that intra-group assessment be done as a confidential exercise.

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Appendix

Criteria for assessment

The person attended out-of-class meetings held for discussing the tutorial assignments

The person actively participated during the out-of-class tutorial discussions

The person came prepared for the tutorial discussions

The person actively participates during in-class group discussions

The person actively contributes ideas for the completion of the tutorial assignments

The person showed a genuine concern for both the task and the welfare of the group

The person played a part in developing inputs from the other team members for the successful completion of the tutorial assignments

Scoring Rubric

10–9	Outstanding contribution and leadership
8.5–7	Superior contribution
6.5–5	Moderate contribution
4.5–3	Occasional contribution
2.5–1	Present but no contribution