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## Effects of cooperative learning structures on self-esteem and classroom climate in social studies

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### Abstract

This paper reports on a study which involves the implementation of cooperative learning in a social studies classroom. The effects of cooperative learning on the self-esteem of pupils and classroom climate were investigated. Interviews with pupils and the experimental teacher were also conducted. Results showed that there was no significant effect of cooperative learning on the self-esteem of the pupils in the experimental group. However, there was a significant effect on the Difficulty subscale of the classroom climate of the experimental group.

Pupils' and teacher's interviews showed favourable attitudes among pupils towards the use of cooperative learning in social studies lessons.

The effectiveness of cooperative learning as an instructional approach has been well researched and documented in the United States, Canada, Israel and United Kingdom. Research reviews and meta-analyses support the view that cooperative learning can increase academic achievement and enhance student self-esteem, prosocial behaviour, inter-ethnic relationships and attitudes toward school (Slavin, 1980, 1989; Johnson, Johnson, & Maruyama, 1983; Sharan, 1980). Cooperative learning also benefits students of all age levels, for all subject areas, and in a wide range of learning tasks (Bossert, 1989). These range from rote-decoding, retention and memory tasks to more complex problem-solving tasks.

Interest in cooperative learning has been on the rise in Singapore. The approach is now featured in the new revisions of the social studies curriculum. Teacher training is being offered in cooperative learning strategies at both pre-service and in-service levels.

The research support and pedagogical ideas on cooperative learning come largely from the United States and Israel. This raises the question whether cooperative learning can be transferred to an Asian cultural and educational context. In our work as trainers, we have met many teachers who are skeptical that cooperative learning will work with

their pupils. There is a deep concern that cooperative learning may run counter to the values of competition and hard work in Asian society and school systems.

### Aims of the Study

This study was an effort to explore how cooperative learning may be implemented by a teacher in the real classroom, and investigate whether it can improve the classroom climate and pupil self-esteem. It also aims to build up a qualitative data base of children and teachers' thoughts about the cooperative learning approach.

Research in cooperative learning is at a nascent stage in Asia. From

international work carried out so far, there has been little reported on cooperative learning in social studies or geography at the elementary grades. Most studies have compared the effectiveness of cooperative learning with individualized learning or direct instruction. Other studies have investigated the effectiveness of specific cooperative learning models. Mattingly & VanSickle's (1991) study found improvement in geography achievement of a ninth-grade class when Jigsaw II was used. In Allen & VanSickle's (1984) study, Student Team-Achievement Divisions (STAD) significantly improved social studies achievement of ninth-grade low achievers but not their self-esteem. In Lampe & Rooze's (1994) study which compared cooperative learning and direct instruction, cooperative learning was found to increase the social studies achievement of fourth-grade students, but self-esteem was found to be related to gender rather than instructional approach. In a recent study using STAD, the effects on academic motivation and achievement of seventh graders were positive in language arts, mathematics and science, except social studies (Reuman & Mac-Iver, 1994).

### Method

#### Sample

The subjects in this study were fifth-grade pupils in a lower-middle income neighbourhood school. It was not possible to reassign the pupils to experimental and control groups because the study was conducted in the natural school setting. Hence, one intact class was assigned as the experimental group ( $n = 36$ ) and another as the control group ( $n = 38$ ).

#### Treatment

Both the experimental and control classes had social studies lessons for one and a half hours each week. The treatment period lasted two school terms (April-May and July-September) within one school year. In

the control class, the teacher received no training in cooperative learning and social studies was taught mainly through direct instruction.

In the experimental class, classroom observations were made to ascertain that cooperative learning was indeed being carried out. In contrast to the control group :

The teacher was trained in cooperative learning strategies. The curriculum materials for cooperative groupwork were planned by the researchers in consultation with the teacher.

The pupils worked in heterogeneous groups of varying academic ability, gender and ethnicity.

Cooperative learning structures developed by Kagan (1992) were used in teaching two entire units of work : "Weather" and "Our Needs - Water".

The structures that were used were Listen - think - pair - share, Numbered heads together, Sequential roundtable and Send - a - problem. The cooperative learning activities incorporated the features of positive interdependence and individual accountability. For example, in the sequential roundtable activity, each pupil in the team had to contribute to the team task of listing words associated with weather and then develop a team web on weather. In numbered heads together, the teams were given some information to learn together. Every team member was individually accountable to master the information because the teacher could call upon anyone to answer on behalf of the group.

The pupils were taught some social skills for groupwork such as "using quiet voices" and "encouraging one another". They were also encouraged to engage in group processing, i.e., evaluate how well they had worked

together.

## Data Collection

### Interviews

The pupils were interviewed in their teams in order to capture inter-personal relationships among the team members. Two teams were interviewed each time - at the middle and the end of the treatment period. The interviews were aimed at gathering qualitative data of the children's perceptions of cooperation in groupwork.

The interview with the teacher of the experimental group was conducted at the end of the study to get her reflections of cooperative groupwork in the context of her school.

### Instruments

Measures of pupil self-esteem and classroom climate were gathered before and after the treatment period.

Pupil self-esteem was measured using the CooperSmith Self-Esteem

Inventory (SEI) (CooperSmith, 1981). The SEI has a list of 50 self-descriptive statements relating to one's social, academic, family and personal experiences. For each statement, the respondent selects either a "like me" or "unlike me" response. The instrument was derived from CooperSmith's early studies of the antecedents and consequences of self-esteem (CooperSmith, 1967).

The SEI has 4 subscales, SEI1 (Social Self-Peers subscale); SEI2 (Home-Parents subscale); SEI3 (School-Academic subscale); SEI4 (General Self subscale). High scores indicate high self-esteem. There is also a Lie subscale (SEI5) of 8 items which takes into account individual defensiveness. A high Lie score would render the data invalid.

The SEI is a validated and well-accepted measure of self-esteem. Reliability studies on the SEI by Kimball (1973) and Spatz & Johnson (1973) obtained consistency estimates ranging from 0.81 to 0.92. Construct validity for the SEI was confirmed by Kokenes (1978).

Classroom climate was measured using My Class Inventory (MCI) (Fraser, 1982). The MCI is a simplified form of the Learning Environment Inventory targeted at elementary grade pupils. It is a shorter instrument and the language has been made simpler.

The MCI has 5 subscales: Satisfaction (MCI1) measures the enjoyment of class; Friction (MCI2) measures aggressive behaviour between pupils in the class; Competition (MCI3) measures how important it is to the pupils of attaining achievement relative to their classmates; Difficulty (MCI4) measures pupils' perception of the difficulty of the class work; Cohesiveness (MCI5) measures friendly relationships among pupils of the class.

The reliability estimates for each of the MCI subscales have been determined in an extensive Australian study involving 2305 seventh-grade pupils (Fraser & Fisher, 1983). The alpha coefficient (the index of internal consistency) ranged from 0.62 to 0.78. Pilot tests of the SEI and MCI have also been done in a Singapore school. SEI had a reliability coefficient of 0.82 ( $n = 268$ ) and the MCI subscales had alpha coefficients ranging from 0.60 to 0.72 ( $n = 266$ ).

## The Findings

### Self-Esteem and Classroom Climate

Table 1 reports the paired comparison t-test on each of the subscales and total scale of the Self-Esteem Inventory. No significant difference was found between the pre- and post-test scores of the SEI for both the experimental and control classes. It has to be said then that, in this study, cooperative learning did not improve the self-esteem of the pupils in the experimental class.

Table 1  
Paired Comparison t-tests (Pretest and Posttest) on the Experimental  
and Control Classes on the CooperSmith Self-Esteem Inventory (SEI)

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Variable	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	t-value
—					
Experimental Class (n = 36)					
SEI1 Social Self	4.56	1.30	4.42	1.61	0.40
SEI2 Home/Parents	5.72	1.56	5.11	1.74	1.77
SEI3 Academic	4.94	1.22	5.31	1.14	1.53
SEI4 General Self	14.67	2.70	13.92	3.30	1.21
SEI5 Lie Scale	3.97	1.30	3.44	1.56	1.75
TOTAL	29.28	4.22	28.08	5.24	1.37
Control Class (n = 38)					
SEI1 Social Self	4.37	1.26	4.66	1.44	1.20
SEI2 Home/Parents	5.53	1.48	5.50	1.69	0.09
SEI3 Academic	5.37	1.02	5.18	0.77	1.07
SEI4 General Self	14.68	3.44	15.08	3.13	0.61
SEI5 Lie Scale	3.84	1.18	3.37	1.13	2.53*
TOTAL	29.24	4.58	29.71	3.90	0.58

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\*p < 0.05

Table 2 shows the paired comparison t-tests on each of the MCO subscales for both the experimental and control classes. A significant difference was observed in MCI4 (the difficulty subscale) between pre- and post-test for the experimental group ( $t = 2.53$ ,  $p < .05$ ). This could mean that because cooperative learning encouraged peer help and teamwork, the pupils consequently felt that classwork was less difficult.

In the control class, there was a significant decline in satisfaction ( $t = 3.69$ ,  $p < .001$ ) and a significant increase in friction ( $t = 2.11$ ,  $p < .05$ ) and competition ( $t = 2.39$ ,  $p < .05$ ). It appears that where

direct instruction was used, the pupils became less satisfied with the classroom environment over time and perceived the behaviour of their classmates to be more competitive and aggressive.

Table 2  
t-tests between Pretest and Posttest on the Experimental and Control  
Classes on  
My Class Inventory (MCI)

Variable	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	t-value			
Experimental Class (n=36)								
MCI1 Satisfaction	23.61	4.32	23.50	4.42	0.13			
MCI2 Friction	13.33	4.22	14.61	4.02	1.42			
MCI3 Competition	14.83	3.33	15.44	3.68	1.26			
MCI4 Difficulty	12.06	3.19	10.78	2.45	2.53*			
MCI5 Cohesiveness	15.44	3.33	14.39	3.64	1.55			
Control Class (n = 38)								
MCI1 Satisfaction	24.84	2.80	22.11	4.48	3.69***	3.69***		
MCI2 Friction	14.63	4.00	16.37	3.97	2.11*	4.00	3.97	
MCI3 Competition			15.53	3.59	17.05	3.24	2.39*	
MCI4 Difficulty			11.05	3.08	11.79	3.31	1.01	3.08 3.31
MCI5 Cohesiveness	13.89	3.60	12.53	4.12	1.63	3.60	4.12	

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

### The Pupils' Views

Although the pupils who were interviewed included some dysfunctional teams (identified by the teacher), the pupils were almost unanimous in saying that they preferred the cooperative learning approach to working alone. The pupils were able to articulate what it meant to "cooperate" and were able to describe the benefits of cooperative learning activities like Listen-think-pair-share, Numbered heads together and Sequential roundtable :

I: ...Which do you prefer better...where you work together as a group or

... where you do (the work) yourself?

P1:Work as a group.

I:What is better about it?

P1:We have more ideas.

I:More ideas, what else?

P2:More suggestions.

I:Okay, what else?

P3:Fun to work together.

The pupils also cited the following reasons for preferring cooperative groupwork :

"...we can discuss some of the answers we don't know ourselves... we can learn more things."

"... it's fun...everybody is doing it and helping each other. It's very happy."

".... when we have to discuss with other people, it helps us."

"....it's a very useful way ... it makes us remember everything."

".... it gives us information. We can listen to other groups."

"...if there is something important to do...then you can ask for help."

In general, the pupils found cooperative groupwork fun, enjoyable and useful in helping them acquire and remember new information.

The use of cooperative group work was not without its problems. A key problem which surfaced in the pupil interviews was that of dealing with conflicts during group discussions:

"...like (when we had to estimate) how much water you waste, some of us say different amounts, then start quarrelling."

"...sometimes, each person say the idea and then the other person don't agree, then we all start quarrelling."

There was some attempts at negotiation and compromise by the children.  
In the following quote, one group described how they reached a compromise when they had to answer their teacher's question on how much water is used when one takes a shower:

P1:18 litres. Then they don't want 18 litres, they take 16 litres.....

I:So in the end, what did you all conclude?

P1:Then we all roughly estimate.

I:How did you all estimate?

P1:Between 16 and 18, so we chose 17.

I:Oh, so you all chose 17. You all came to a compromise.

Sometimes, disagreements were resolved through the "majority wins" rule :

P:Sometimes we have disagreements...different people have different ideas. Everyone wants their own ideas and everyone starts to quarrel.

I:How do you resolve this difference?

P1:After a while, you just give way.

P2:We take a vote and the majority wins.

There was one team which was deadlocked on a decision and resolved it through a child's game :

P1:Sometimes I've got one idea, they've got another idea, so you can't decide and we quarrel.

I:How do you come to decide whose idea to put on the paper?

P2:We play scissors, paper, stone.

Other common difficulties encountered by the pupils during group

discussions included "taking turns to talk" and "controlling the noise level".

#### The Teacher's Views

The teacher of the experimental class was a self-confessed traditional teacher prior to the study. When interviewed at the end of the study, she reported a change of heart as she discussed the effects that the cooperative learning approach had on her lessons. She found Numbered heads together particularly good in encouraging the pupils to think together, the abler pupils helping the weaker ones. For her, the benefits of cooperative learning for her pupils were that :

"they enjoy the lessons."

"the pupils... the minority groups, cooperate very well."

"the children learn better."

"because of this method of teaching, the class become interested in

social studies, so they did well in the final exams."

When asked how she knew her children learned better, the teacher said :

"...From the way, they speak; their enthusiasm for their work. And in fact they like groupwork. They prefer it to individual work. They always ask to do groupwork."

## Discussion

In this study, the use of cooperative learning did not produce the desired effects on pupil self-esteem. This could be due to several factors. First, using cooperative learning for just 3 lessons per week (one-and-a-half hours each week) does not appear to be sufficient to produce changes in a child's self-esteem. As CooperSmith and Feldman (1974) had suggested, change in self-esteem are slow to develop, and requires more sustained treatment than was possible in this experiment. Second, because cooperative learning was used in teaching social studies - a non-examinable subject in our schools - whatever positive impact it might have had on the pupils were not sufficient to override the more pervasive effects of competition and demanding examination effects.

With regard to classroom climate, there was no significant improvement in most of the variables measured, except difficulty of class work. However, some important contrasting trends were observed in the control class. Between the pre- and post-test, the control group pupils became significantly less satisfied with their class, and perceived more competition and friction among their classmates. It may therefore be said that even though cooperative learning did not significantly improve the classroom climate of the experimental class, it helped to stem the decline of pupils' views of classwork and their classmates.

It was a surprising finding that cooperative learning resulted in the pupils perceiving class work to be less difficult. This may be due to the security of shared responsibility, where the pupils were allowed to get help from their teammates when they needed it. The perceived demands of class work were therefore lightened by the opportunity to consult and interact with their peers :

"Usually when we do groupwork, we always talk, laugh and joke. When it comes to maths, it is difficult."

"When (teacher) tells us to do.....groupwork, we will do it because it is better to do it with our friends."

"Some of them know more than us, so can learn from them."

## Conclusion

This study showed that the affective outcomes of cooperative learning

are difficult to measure in a natural classroom setting. Nonetheless, there were qualitative gains which were observable, in particular greater enjoyment of social studies lessons. This was evident both in the classroom observations of the teacher by the researchers, and from the interviews with pupils. Most of the children preferred working in groups to working alone. They felt that this made the lessons seem less difficult and more enjoyable. Some children were also able to say that cooperative learning helped them learn better, and remember the information they had to learn. A spillover effect of cooperative learning was to put the pupils into situations where they had to learn how to deal with interpersonal differences and resolve conflicts.

The intervention in this study did not produce the positive effects on self-esteem and classroom climate probably because the school conditions placed some constraints on the use of cooperative learning. The limited success nonetheless vindicates our belief that more of cooperative learning should be used in our elementary classrooms. The children's enthusiastic support of the method should spur teachers to include cooperative learning in their repertoire of instructional methods.

For future research in cooperative learning, we need to investigate the specific elements of cooperative learning that are most likely to be effective in Asian classrooms. There is still the question of how cooperation and competition can be developed in juxtaposition. Meantime, we hope that more of our elementary pupils will be exposed to cooperative learning. We hope too that cooperative learning will be extended to the teaching of a wider range of subjects in our elementary schools.

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