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Student Teams Achievement Division (STAD) and Teams-Games-Tournaments (TGT) in Cooperative Learning

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Abstract: Cooperative learning is widely recognized as a teaching strategy that promotes learning and socialization. In contrast to the traditional classroom, the teacher in a cooperative learning setting is no longer the director of instruction but the facilitator of learning. The students are responsible for their own learning while the teacher models strategies and provides scaffolding to support students' thinking until they are ready to learn and work on their own This paper, on the basis of the theories and researches that have been done on cooperative learning, will have an overview of this field with emphasis on two cooperative learning approaches----Student Teams Achievement Divisions (STAD), Teams-Games-Tournaments (TGT). These techniques are successful in the perspective of motivation in the classroom. In addition, the issues involved in each method and the teaching implications were discussed. For instance, the problems classroom teachers may face when using these methods and the possible solutions to such problems. Finally, an attempt is made to explore some unresolved issues in cooperative learning. This paper concludes that cooperative learning has the potential to become a primary teaching approach to achieving various goals. However, there is a need for more research on the conditions necessary for success in cooperative learning.

Keywords: Cooperative Learning, STAD, TGT, Teaching Implication

1. Introduction

The multiple benefits of cooperative learning have been recognized in most research literature. Cohen notes that "Cooperative learning has gained increasing acceptance in classrooms here and abroad as a strategy for producing learning gains, the development of higher order thinking, prosocial behavior, interracial acceptance, and as a way to manage academic heterogeneity in classrooms with a wide range of achievement in basic skills." [1]. Indeed, cooperative learning is widely viewed as an effective teaching strategy in classrooms. This paper, on the basis of the theories and researches that have been done on cooperative learning, will have an overview of this field with emphasis on two cooperative learning approaches. In addition, the teaching implications of using these methods are discussed. For instance, the problems classroom teachers may face when using these methods and the possible solutions to such problems. Finally, an attempt is made to explore some unresolved issues in cooperative learning.

2. What Is Cooperative Learning

Most teachers would have assumed that they have used the strategy in one form or another at some point during lessons. However, it is important to realize that cooperative learning should not be confused with "group work" [2]. If the work can be done individually or it is just a project involving a division of labor and later put together with no interaction among the project members, cooperative learning is absent.

According to Johnson and Johnson [3], there are five essential components in a cooperative learning activity: (1) positive interdependence ("exists when students perceive that they are linked with group mates in such a way that they cannot succeed unless their group mates do."), (2) individual accountability, (3) face-to-face promotive interaction ("individuals encouraging and facilitating each other's efforts to achieve, complete tasks, and produce in order to reach the group's goals"), (4) interpersonal and small-group skills and (5) group processing, that is, reflecting on how well the group is

functioning and subsequently improving on the process of cooperative learning.

Cooperative learning involves students working together to achieve a common goal. Students learn to help each other, share resources and gain new understandings when they explain, discuss and clarify their ideas with each other. They are also responsible for their own learning both as a group and as individuals. Each team member is responsible for his learning as the attainment of the group goal is dependent on the individual learning of all team members.

"The cooperative goal structure, in which all members of the group benefit or suffer on the basis of the learning of members, creates a "sink or swim together" sense of interdependence that promotes a vested interest in maximizing the learning of all members. Low academically able groupmates need the most help, and therefore, the nonhandicapped students will focus their attention on their handicapped peers." [4]

Hence, in contrast to the traditional classroom, the teacher in a cooperative learning setting is no longer the director of instruction but the facilitator of learning. The students are responsible for their own learning while the teacher models strategies and provides scaffolding to support students* thinking until they are ready to learn and work on their own. To add, students who learn in a cooperative environment where the teacher is a facilitator are more likely to develop metacognitive processes [5].

There are different approaches of cooperative learning. For example, Student Teams Achievement Divisions (STAD), Teams-Games-Tournaments (TGT), Jigsaw (I and II), Group Investigation (GI) and Dyadic approach. This paper will only focus on the use of STAD and TGT methods.

3. The STAD and TGT Approaches

In the STAD approach, students are first presented with information by the teacher. The students are then divided into groups of fours, fives or sixes. Each group should, if possible, be heterogeneous, with members of both sexes, different ethnic groups, and with students of high, medium and low ability. Team members use worksheets and through quizzes and discussions, help each other learn the academic material. Each student is then tested individually on the material in quizzes. An improvement score instead of an absolute score is given to the student. The individual improvement scores are added to give a team score. Teams may earn certificates (or other forms of recognition through class newsletters and bulletin boards) if team members show the greatest improvement on their test scores [6]. It is important to note that the use of improvement scores has an equity feature. These improvement scores provide equal opportunities for all students, of different abilities, to contribute to the overall score. Moreover, STAD can only be used for certain kinds of content. It is suitable for learning factual knowledge (for example, the properties of solids) and not "ill-structured" tasks with no single answer (for example, moral or ethical issues) and which require discussion [7].

TGT is similar to STAD in that the teacher presents the material first and students will help each other learn the material. However, instead of quizzes, the students have tournaments where they compete with members of other teams to gain points for their own team. Like in STAD, team recognition is also given.

4. Discussion of STAD and TGT Approaches

The motivational perspective can be used to explain why STAD and TGT are successful in the classroom. In these techniques, the team members are motivated to help each other, instead of doing their work individually, as they can only be rewarded if everyone in the group does well. Using group rewards based on individual performance also prevents the most competent member from doing all the work, hence the group must ensure that the learning needs of all members are met [5].

O'Donnell and 'Kelly [2] suggested that Slavin's techniques (e g. in STAD) minimized the strains on group interaction in three ways. The structure of the task, the processes used to ensure individual accountability and the use of inter group competitions minimize the problems of group interaction.

According to O'Donnell and 'Kelly, the tasks in STAD (and TGT) do not require much cognitive and metacognitive processes from the team members. Students help each other by asking a list of questions and checking the answers which were all provided by the teacher. This task will encourage participation from low ability achievers as the nature of the questions and answers are manageable for them. In contrast, a difficult task will usually exclude such members from participation. They will also feel pressure from higher ability achievers during the completion of the task.

Secondly, the use of improvement scores rather than absolute test scores ensures that individuals are responsible for improving on their performance. This makes success more attainable, especially for low ability achievers, and thus all students will feel the need to participate and value their team members contribution. If absolute scores are calculated instead of improvement scores, low ability achievers will not be able to contribute to the group goal. Pressure from the other members may be felt and social cohesion of the group will be adversely affected. In short, the STAD enables the high, average and low achievers to contribute to their team's score by improving on their past performances. Low achievers can help their team as much as high achievers, so the contributions of all members are valued. Group members, especially the low achievers, can attain success more easily than in a competitive environment (where there can only be one winner) and will feel a sense of competence. This will in turn, result in greater motivation for the task.

Thirdly, cooperation within the group to compete with another group may promote social cohesion in the group. Social cohesion is "likely to maintain effective group functioning" and raise the motivation of team members. "The

use of improvement scores probably serves to protect low-functioning individuals form the social sanctions against poor performance that typically occur in a competitive environment." [2]. However, In the Slavin techniques, the group size is usually about four to six students. Large groups may be difficult to manage and there may be conflict and competition among team members. Social cohesion theory may not be possible in this situation.

As stated above, the social cohesion theory may be used to evaluate the STAD and TGT methods as well. Social cohesion is required if members are going to be willing to discuss and help each other. The student (especially the high ability student) who does not care about his teammates can still choose to work individually and leave the lower ability teammate to study for the quiz alone. Social cohesion is also needed for students to feel obliged to improve their performance so that the teammates will not be let down. In addition, improvement scores may be taken instead of absolute scores but if a student's improvement score is not as high as or higher than the other group's, there will still be pressure on, typically, the low ability student. This causes conflict between members and social cohesion is again lessened.

While the STAD and TGT approaches do have many practical and useful ideas for teachers, there may be some aspects which teachers should take note of. Firstly, the choice of group reward is important. These approaches rely on extrinsic reward interdependence and individual accountability. Cohen [8] raises the possibility that group rewards and individual accountability may only be necessary for low level skills and not for higher level skills. In this case, as STAD and TGT are for low level skills, they would require rewards. If students do not see the reward as desirable, they will not be motivated to work towards a common goal. Team members will not be motivated to ensure that the other members are learning and helping each other. On the other hand, if the reward is highly valued, certain group members, especially the low achievers, will be pressurized by the other members to perform. This will reduce cohesion of the group [2]. Thus, the teacher, if she chooses to reward her students, must select a suitable reward that motivates students to want to help each other and to want to improve on their scores. Typically, the main reward used is recognition of the group performance in the class newsletter. Regardless of the kind of reward given, the extrinsic motivation must be sufficiently "attractive" to encourage the exhibition of cooperative behavior.

Secondly, as STAD and TGT are mainly suitable for learning factual knowledge, the concept of improving on past performance may just encourage rote-learning of facts to get rewards. Students could just remember the answers to the questions they had wrong without understanding why they had made the mistake in the first place. Thirdly, it is mentioned above that improving previous performance increases the sense of competence in learners. However, this sense of competence is only applicable when STAD or TGT is used. Students may lose this sense of competence (and hence,

motivation) when other difficult, problem-solving tasks that do not involve the calculation of improvement scores are given. Fourthly, using the STAD and TGT, the teacher needs to spend a large amount of time calculating and taking note of students' individual performance and the overall group score. It may not be practical, especially in an Asian classroom with at least forty students.

Lastly, participants in group work also need good interpersonal skills and tolerance for others when cooperating in groups. Some students may neither have the ability nor the experience to manage such complex social interactions. When group collaborations are on "ill-structured" tasks or in unstructured learning environments, the training of social skills is all the more crucial. Unfortunately, the STAD approach neither emphasizes reflection on students' social skills and group process nor student status.

Despite the criticisms on these methods, positive effects of Jigsaw, STAD and TGT on student learning (e g. in mathematics and English) and an improvement in attitudes toward racial minorities and the physically disabled have been found from research [5].

5. Practical Implications of Cooperative Learning in Teaching

Cooperative learning is a teaching strategy that if used correctly, is beneficial to students' academic achievement. Students are more motivated to achieve during cooperative learning than if they work alone [9]. "When students work cooperatively together, they learn to give and receive help, share ideas and listen to other students' perspectives, seek new ways of clarifying differences and resolving problems, and construct new understandings and learning from engaging in these processes." [10].

Teachers must note that cooperative learning must be done on a regular basis and not on an ad-hoc basis. Gillies argued: "It appears that when schools do not actively seek to promote cooperative, small-group learning, children do not derive the same sense of commitment and cohesion with their groups." [8]. In addition, students were more willing to share ideas and resources and provided more help when they were familiar with cooperative learning [11].

Students should also be taught team building skills to increase the cohesiveness of the group. For example, in a Gillies and Ashman [12] study on the behaviour and interactions of students in cooperative groups, the students in the cooperative condition were taught small group procedures and social skills that encouraged group cooperation'. The findings reveal that". The students in the structured groups were consistently more cooperative and they provided more elaborated and none elaborated help than did their peers in the unstructured groups." Hence, it is only when there is social cohesion will group members be able to work cooperatively and interact well with each other. However, if the students are not taught how to work in a cooperative group, pupils will be less positive about cooperative learning and a problem like

'social loafing' will occur [2]. There will be individuals who do not take responsibility for a task and leave the work to the other members in the group. These members may experience what is termed as "the sucker effect", and may respond by withdrawing the effort themselves [13]. This can cause a decline in motivation during cooperative learning. Therefore, the teacher needs to lay down the rules for appropriate social behaviour, reinforce the performance of such behaviours and ensure students have learnt the necessary team building skills.

Cooperative learning also leads to a slower instructional pace for the high achievers who might feel bored by the non-challenging tasks (especially in STAD and TGT) and they will not see the necessity to interact. However, a difficult task will decrease the motivation of low ability students to work and result in nonproductive group processes. Furthermore, research has found that high achievers tend to perform better in homogeneous groups than in heterogeneous groups [14]. This could be because in a heterogeneous cooperative group, there is no one to give valuable feedback that would help the high achievers excel [15].

6. Conclusion

This paper has focused on the workings of two cooperative learning approaches ---- STAD and TGT. The issues involved in each method and the teaching implications were discussed.

Slavin and Stevens did a two-year study where cooperative learning was applied across several curriculum areas and found that after the two years, the students had higher achievement in "reading vocabulary, reading comprehension, language expression and math computation" than students in schools which did not use cooperative learning [15]. Thus, cooperative learning has the potential to become a primary teaching approach to achieving various goals. However, there is a need for more research on the conditions necessary for success in cooperative learning.

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