CREATING A COOPERATIVE CLASSROOM THROUGH IMPLEMENTATION OF STAD METHOD FOR BIOLOGY LEARNING

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In the past decade, teaching was considered as interaction between teacher and students and focused on the transfer of knowledge from the brain of teacher to the brain of students. But in the present century, knowledge sources are vast and role of the teacher is shifted from knowledge giver to facilitator for knowledge creation. So, to address the need of present society, teacher educator should quest for some innovative pedagogical practices, which can equip our young learner with skills like problem solving and critical thinking and values, such as harmony and cooperation. These skills and values can enable our learner to face the challenges of this fast growing society. Therefore, in the present paper the authors attempt this to create cooperative learning environment within the Biology classroom through implementing the lay out plan based on Student Test Achievement Division (STAD) method of cooperative learning. Incorporation of this method may prove helpful for teacher and learner to achieve their learning goals in the light of contemporary demand of society.

Keywords: Cooperative Learning, Student Test Achievement Division (STAD) and Science Classroom.

Introduction

The present fast growing society is dominated by science and technology in every sphere of life. Science education is a crucial part of the curriculum and the concern of quality science education is a major challenge for the educationists. In this reference, the National Curriculum Framework (NCF-2005), draw attention towards the equity issues and inert pedagogical practices for teaching science. These traditional practices unable students to develop as an independent learner, problem solver and creative and critical thinker. The traditional teaching practices followed in our classroom assume science as inert body knowledge and it should be transferred from the head of teachers to the head of students. These assumptions for teaching should be modified according to the present challenges of contemporary education. Oyedokun (1998) reported that because of the overloaded biology syllabus, the teachers in secondary schools make use of lecture method, which they feel helps them convey the large amount of information to the students within a short period of time. As a result, the gap between poor and good student increases. Every one attempts to do better than the other so, classroom is dominated with throat cut competitions. Every student wants to be best and this overemphasised competitive environment creates stress among the students. Getting failure in facing competition and performance stress may develop anxiety among students that inversely affect their achievement and other dimensions of life as well. The conventional classroom provides very less scope to encourage students' active

participation in the teaching-learning process and no concern for individual difference. This creates monotony in the science classroom and students lose their interest in the subject (Achor *et al.,* 2013). In contemporary scenario the paradigm of teaching is shifted from 'teaching' to 'learning' (Yaduvanshi and Singh, 2015). In this context, science educators should rethink about renovating the pedagogical practices. To address these issues, teacher can quest for some alternative pedagogical practices that can create a classroom as a harmonious place for learning rather than just a teacher-taught interaction. For this, teacher can implement cooperative learning strategies, which has theoretically grounded and well researched method. Cooperative learning has been used as both, an instructional method and as a learning tool at various levels of education and in various subject areas. It represents a shift in educational paradigm from teacher-centred approach to a more student-centred learning in small group. It creates excellent opportunities for students to engage in problem solving with the help of their group members (Zakaria *et al.,* 2013).

Cooperative Learning

Cooperative learning is a small group instructional strategy in which students work together to facilitate their own and each others learnings. Cooperative learning setting helps the students to attain their learning goals, if and only the other students in the learning group also reach their goals (Johnson *et al.,*1999). The prime requirement for creating cooperative learning environment is to constitute hetrogenous group of students and particular roles are assigned to them. The role of the students and their task within the group work are finely structured so that group members have to cooperate to succeed. Various researcher findings confirm the effectiveness of cooperative learning in all levels of education from primary to tertiary. Comparative to traditional pedagogical practices like instructor-centred lectures, individual assignments and competitive grading, the students learned under cooperative setting tend to exhibit higher academic achievement, better high-level reasoning and critical thinking skills, deeper understanding of learned material and less disruptive behaviour in class, lower levels of anxiety and stress, greater intrinsic motivation to learn and achieve, greater ability to view situations from others perspectives, more positive and supportive relationships with peers more positive attitudes toward subject areas, and higher self-esteem. (Felder and Brent, 2001). Thus, we can say that cooperative learning is an innovative approach in which students work in a group, achieve their goals in a pleasant and conducive teaching-learning environment. Such learning classroom environment will definitely reduce the occurrence of the unpleasant situations and maximise the learning outcomes and satisfaction of learners that result from working in a high performance team. Thus, it is the call of time to incorporate this strategy in our classrooms.

Johnson *et al.* (1998), emphasised that cooperative learning is not simply a synonym for students working in groups but any learning exercise only qualifies as cooperative learning if it constitutes five essential elements. These five essential elements of cooperative learning are positive interdependence, individual accountability, face-to-face promotive interaction,

collaborative skills and group processing skills. Positive interdependence is one of the most significant component of cooperative learning strategy, so each member of the group is responsible to help each other to achieve the shared group goal, if any member is not doing well all group would suffer. In short, they enjoy common success and failure. Another major significant component of individual accountability is that it deals every member bound; to perform his or her assigned group role with accountability for the mastery of all content to be learned. Face-to-face promotive interaction also plays critical role in designing cooperative learning classroom. It provides opportunities for group members to share their work with each other. In a cooperative learning environment, some of the group work may be done individually, some must be done interactively, with group members providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching and encouraging one another. Any group work can be sucessful when there is an appropriate use of collaborative skills that encourages learners to develop and practice social skills among them like trust-building, leadership, decision-making, communication and conflict management skills. For nurturing the social skills among learners, it is important to train them in group processing skill so that they can reflect back on their group work periodically and do assessment to identify changes they will make to function more effectively in the future.

For implementing the cooperative learning within the classrooms various model were proposed by different researchers. According to Slavin (1995), the models for cooperative learning differ from each other in various aspects some popular models are discussed below.

Models of Cooperative Learning

One of the most popular and widely researched model used in School Science is Student Teams-Achievement Divisions (STAD). It is a well-structured model for cooperative learning, most suitable for beginners. As it is a formal type of cooperative learning, where quite structured learning environment is provided to learners where learners of diverse ability, sex and ethnicity formed a heterogeneous group for several weeks or whole semester and learn together for a shared mutual goal. In this model, the teacher briefly presents the content to the students with its major highlights and then assign the roles to students. Worksheets or some common assignments or activity is given to the group. All students have to work on their shared part. The main goal of the group is to make sure that all team members learn the concept properly. At the end, assessment is conducted via quizzes or presentation for individual member as well as for the group as whole. Students earn team points based on how well they scored on the quiz compared to the past performance. Another model is TGT (Teams-Games-Tournament) is very much similar to STAD model in its implementation phase, while for final assessment, quizzes are replaced by tournaments. Students who have equal scores will compete with each other in the tournament's table (Johnson *et al.*, 2000).

STAD and TGT are formal type of Cooperative learning (CL), while Jigsaw method is another widely used model of CL. The cooperative learning Model is based on informal unstructured way of creating cooperative learning classroom. In Jigsaw model, groups

work temporary for short duration of time. Under this model, a particular topic is divided into sub-topics and each group member is assigned to learn and teach one sub-topic to their group fellow. They are referred to as experts for that sub-topic in their group. The experts from different groups meet together and discuss on the assigned sub-topic. The expert from each group who has expertise on sub topics will return to their respective home group and teach that sub topic to other members. Other models are 'learning together' that emphasised on promotion of interpersonal skills and social skills and group investigation that can promote enquiry and intrinsic motivation.

Out of these models, researcher had taken STAD Model for developing a layout plan for teaching biology to Class IX students.

Phases for Creating Cooperative Learning Classroom

In a conventional classroom, students are used to learn in a very monotonous set up, where they used to sit and communicate in a fix pattern. Teacher talk is dominated, less scope for student-to-student talk and stressful competitive environment to earn grades. So, for creating a cooperative learning classroom, first of all, one needs to orient the students towards this new pedagogy. For fostering cooperative learning in a classroom the following phases has to be used:

(i) **Orientation Session:** During this session, teacher has to orient the students towards the benefits and needs of teamwork. With the help of variant of examples like the Indian cricket team, fun games and stories of unity. The teacher then, can orient students to work in a group as a team and encourage them to develop a harmonious relationship among them. It can be planed in different instructional sessions for different activities like fun gaming or inspirational stories. Teacher must explain all essential elements of cooperative learning and the benefits of cooperation over the competitive and individualistic learning.

(ii) **Group Formation:** After orientation, the students have to be divide in groups. Teacher should take note that the group must be heterogeneous and composed of diverse students like students of different achievement level, gender, caste, socio-economic class, etc. The teacher should try to keep high achiever, average achievers and low achiever in the same group.

(iii) **Role Assignment:** The teacher will assign different roles to each member of the team on a rotation basis. In cooperative learning, each member of the group is responsible for their assigned role and accountable for completing their share of work or tasks. The role may be of a captain to lead and guide the group, reporter to make a final report for the whole group, researcher to search out for learning resources and a checker to check the learning status of group members. The role of team members can be changed at alternate week. In this way, each member played and experienced all the roles during the cooperative learning sessions.

(iv) **Execution:** After the planning of STAD and role assignment, the next important steps are implementation phases of STAD. Here, teachers need to design some layout plan and

activities for the topic to be taught. In the present study, researcher had developed a layout plan and worksheet on the topic 'Muscular Tissues' for systematic implementation of STAD in the classroom.

(v) **Evaluation:** The last phase is for evaluation, where teacher evaluates the performance of the student as an individual and as a group member. In the study conducted, the researcher assesses the learning outcome of the students during her visit to the different group. Students earn team points based on how well they scored on the quiz compared to the past performance. Individual as well as group performance, both were considered for final assessment. The team with a highest score was declared as the winning team and the title of 'Biology Star' was given to them.

Sample Layout Plan Based on STAD

Topic: Muscular Tissues

Objectives:

1. Students will be able to name different types of muscular tissues.
2. Students will be classifying different muscular tissues.
3. Students will be able to differentiate the activities performed by voluntary and involuntary muscles.
4. Students will be able to discuss in detail the activity performed by different muscular tissues.

Materials Required: Worksheet developed by teacher one copy in each group, chart having a picture of different muscular tissues, text book or books and a pen.

Procedure:

1. Students are already divided into heterogeneous (mixed level of academic ability and gender) group and their roles assigned as captain, sub-captain, reporter and checker.
2. Teacher will give brief concept about muscular tissues by showing a figure of different types of muscular tissues (from chart) to the students.
3. Teacher focused the attention of students on the point that the shape and number of nucleus in different muscular tissues varies.
4. Then the teacher will provide worksheet to each group and instruct them to fill and complete it cooperatively after discussion with each other.
5. While students are working in a group teacher moves to each group to observe the activities of students, provide motivation, guidance and also help them to resolve the conflict, if any arises.
6. Here, during his or her visit to different groups, teacher also assesses the learning outcomes of students.

Closure: Reporters from different groups were asked to give a final report, either in oral or written format.

Assessment: Students of each group are given a particular number like 1, 2, 3 and 4. Ask a question by calling any random number.

Extended Activity: Students will think and write down the types of muscular tissues present in different parts of their body.

Worksheet for Layout Plan

Topic: Muscular Tissues

Q.1. Name the following:

a) Muscular tissues consist of elongated cells also called as—_____.

b) Multinucleate muscle fibre—_____.

c) Spindle shaped muscle fibre—_____.

d) Muscles attached to the bones and help in body movement—_____.

e) Muscles of the heart that show rhythmic contraction and relaxation throughout life—_____.

Q.2. Differentiate the following activities on the basis of voluntary or involuntary muscles.

(a) Jumping of frog—_____.

(b) Pumping of the heart—_____.

(c) Passing of food in your intestine—_____.

(d) Movement in iris of eye—_____.

(e) Closing the eyelid—_____.

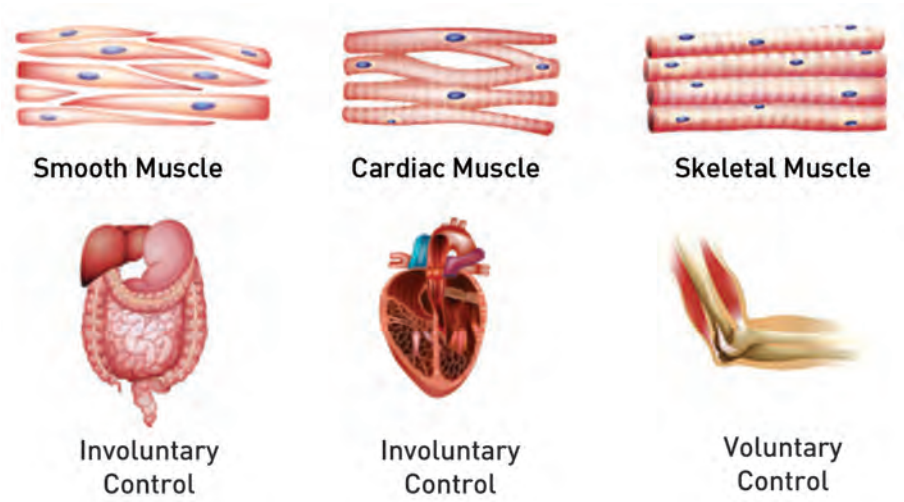
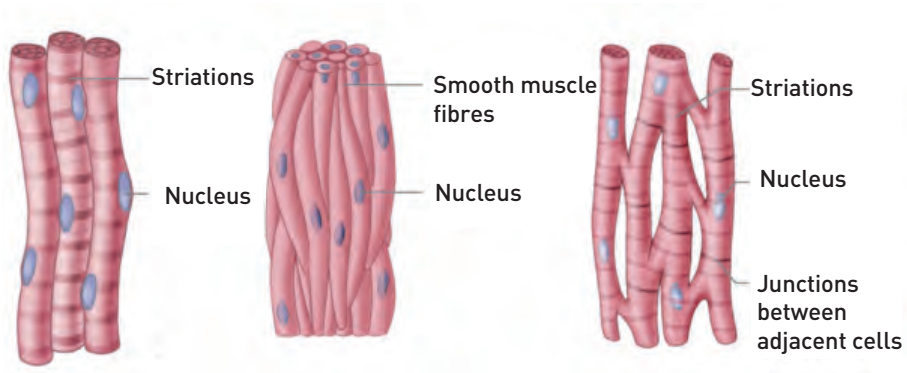


Fig. Types of Muscular Tissues

Q.3. After observing the above figures on 'Types of Muscular Tissue' distinguish among the following three muscles based on the given parameters:

Name of Muscles	Cylindrical or Spindle-Shaped	Branched or Unbranched	Voluntary or Involuntary	Uninucleated or Multinucleated
Striated				
Unstriated				
Cardiac				

Q.4. Lets observe the given figures and answers the following:



i) Identify and name the muscular tissues for figures A, B and C.

ii) Name the different body organs of humans, where these muscular tissues are found.

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