The Impact Of Cooperative Learning In University Students

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Abstract: An innovative method of teaching such as cooperative learning was proposed almost four decades ago to improve the classroom interactions. Though the method is very popular among teachers, through the faculty development programmes, its poor success in implementation is a matter of concern. Its unique characteristics of improving both academic skill and social skills in students are ideal for the holistic development in students especially for the professional courses. It gives emphasis on cooperation rather than competition among students in a class. In this study, we focus on implementing a cooperative learning method at a University level. The effectiveness was measured based on assessment done at the end of activity for the knowledge and student's reflection was considered to assess the improvement of social skills. It resulted in an overall improvement in knowledge gain as well as social skills among students.

Key words: Cooperative learning, university students, active learning

1. INTRODUCTION

The function of education is to teach one to think intensively and to think critically” [1]. The functional members of the society comprises of educated individuals [2]. Students develop personal attributes and cognitive skills through education and education is at its best when it is accomplished as a team sport [3]. One of the objectives of educational system is to impart knowledge through teaching and learning methods. The traditional style of teaching is one way interaction and is teacher centric whereas the active learning methods are student centric. In a traditional teaching strategy, teacher imparts knowledge to students while in an active method, teacher facilitate learning as well as inculcate soft skills. Teaching and learning go hand in hand that, conventionally, the teaching was evaluated based on the knowledge gained by students than by assessing the methods of teaching. Lecturing methods do not ensure participation of students in learning rather learn the concepts superficially [4]. It is not developing confidence or passion in students [5]. Active learning has shown to impart attitude [6], [7] and also attain the learning outcomes [8]. In active learning, students perform meaningful activities and reflection on their activities leads to learning [9]. Active learning stimulates curiosity and commitment towards learning. Team based Learning (TBL) is an approach in teaching and learning and it encourages learning through peer to peer interaction in small groups within a large class [10]. The features that are necessary for effectiveness of cooperative learning are positive interdependence, direct verbal communication, responsibility as individual, social skills, participation in group and proper grouping [11], [12]. Cooperative learning techniques largely appreciated in college education as best practice however is not implemented extensively [13].

Effective cooperative learning methods are substitute to the traditional lecturing method [14]. Additionally, cooperative learning in a great deal remediates the difficulties students may come across while learning new concepts [15]. Cooperative learning develops the skills within the group such as communication, mutual acceptance and support [16]. Formal and informal are the two kinds of cooperative learning methods that are practiced. In formal approach, method is structured to accomplish a learning objective where as in informal, passive learning is achieved in group learning [17]. Assessment on student’s performance within the group have established that the student who advance most through cooperative activity are those who contribute and accept detailed explanations on the topic [18]. One of the reasons for underutilization of classroom activities is low level of its acceptability among students [19]. Teachers tend to use the methods which use less resources and time and similarly based on the effectiveness from their previous observation. The teachers find it difficult to form coherent and interdependent group [20].

Sharan [21] observed the cooperative learning could be based on combination of different skills such as

1. Models based on knowledge and motivation
2. Models based on social skills and interpersonal communication
3. Models based on complex instruction and group investigation.

In a gallery walk approach, groups of students visits different stations to answer or critically question on other group’s question and answer. Initially the faculty identifies the topic or problem at each station. Once the group builds on respective problem, other groups visit them where in presentation and discussion occurs [22]. Gallery walk has advantages that it improves critical thinking, face to face interaction and ability to evaluate analytically the conclusions of other groups. Gallery walk makes lots of excitement and physical activities in the classroom [23]. Nevertheless, the gallery walk turn out to make ‘classroom chaos’ with large number of students moving about the classroom [24]. Gallery walk is an example of cooperative learning and also resorts active participation of students in higher order learning such as creating vital concepts and improves an individual’s capacity in writing as well as pubic speaking [25]. Gallery walk is a learner centered
activity and a presentation method. Chin, Khor and Kian [26] observed that gallery walk might not be preferred by students who follow visual learning style.

Theoretical perceptions of Cooperative learning

1. Motivational Perspectives
Motivation of the student is the most important part of the process to achieve learning of the students [27]. The incentives to the members' makes a situation in which the only way the students achieve their personal targets if the group is successful [28]. When the group members worth the accomplishment of group, they are encouraged to help other members to learn.

2. Social Cohesion Perspective
Group unity or cohesion is an important factor for the success of group discussions. Students will in turn feel that they need to help one another to learn and would take part actively for the accomplishment amongst group.

3. Cognitive Perspectives
The intellectual involvement of the group members would lead to learning of all members in the group rather than with motivation [27].

2. CONTEXT AND APPROACH
The team based learning exercise was carried out for the course Heat and Mass Transfer (14FP2005) which is a core requirement for B. Tech Biotechnology programme in the University.

2.1 Group Formation
The batch consists of 55 students and the pre requisite for the topic of discussion was taught by the course instructor. The entire batch was divided into 11 mother groups of 5 members each. The groups were formed based on their score in internal assessment. Each group consists of members with high, medium and lowest scores in internal assessment. Among the 11 groups, 2 sub batches of 5 groups identified and 1 basic group existed to discuss on common terms and basic definitions. Then, 5 different topics were allotted to each group in both the sub batch so that same topics were discussed in both sub batches.

2.2 The Gallery walk method
The students had to follow the notes from the prescribed text book in the syllabus. All students were asked to read whole topic prior to the activity and were asked to bring text book materials to the class. During the activity, students had the access to internet to acquire more information pertaining to the topic. About 30 minutes were given to the mother groups to discuss on the respective topic. Each of the students was encouraged to raise questions, critically analyze and find solutions to the topic. The course instructor was assessing the participation and involvement of each member. Subsequently, each group was provided with A3 size chart papers and markers to make posters that covered the topics given to the group. Poster preparation had to be completed within 15 minutes and individual contribution was expected from student. Later group members were shuffled to form 10 educated groups among both sub batches. The shuffling was done such that 5 members in each educated group represented different mother groups and also with internal assessment of highest, average and lowest. The students of basic group had also joined the educated group so as to make count of 6 in certain groups. Each of educated group had to visit 6 posters including the basic poster. While they visit each poster, the educated group members would discuss on the topic and respective mother group explains the topic in detail. The poster presentation, all students were to raise questions or critically analyze question. This exercise continued for 30 minute and finally members joined mother group to discuss on the different topics and to summarize the learning outcome.

2.3 Assessment and impact analysis of method
Subsequently a multiple choice quiz was conducted to evaluate the learning and a feedback survey was collected to analyze the outcome of the exercise. The feedback survey consists of questionnaire related to self-evaluation of the impact and the effectiveness of the method.

3. FINDINGS AND DISCUSSION
Students were seemingly happy and interested in the activity. The activity relieved the students from the boredom of instructive lectures as they were physically active during the class. Gallery walk facilitates students move around the class, high level thinking and effective communication [22]. This provides an association with students for a collective purpose and group members feel connected to achieve their common goal [29], [30].

3.1 The effort by an instructor and student
Compared to traditional method, moderately low effort is required during the conduction, nevertheless, the instructor's involvement is vital during the conduction of method as it may happen some members might have wrong interpretation of the topic or also might deliver incomplete information. Instructor had to be part of discussion for a considerable time with each group to ensure the same. Similarly, individually students were assessed for their involvement, thinking level and other soft skills. However, the student involvement was more as they were part of both teaching and learning. Student also developed critical analyzing skill as they have to post questions on other group’s questions. Discussions and interactions during gallery method can stimulate higher order cognitive skills by attending open ended questions [31], [32]. The students assume the responsibility of learning by themselves and the teacher’s ability to offer structured, systematic directions to get the students into discussion is very important. The involvement of students in such type of cooperative learning is difficult to achieve if they are not directed properly [33]. A continuous reflection on the learning and effectiveness needs to be considered to validate the implementation of the cooperative learning method. While planning the teaching strategy, an instructor could reflect on the student's learning style which includes methods individuals observe, interrelate with, and make conclusions about the knowledge [34].

3.2 Evaluation of skills of students by faculty.
The instructor could assess the students based on different parameters such as involvement, time and people management, team-work, creativeness, problem solving skill. These skills are very important in their professional career.
Where as in traditional approach an instructor could assess knowledge gained only through tests or exams Chin, Khor and Kian [26] recommended a quiz at the end of activity be conducted to ensure learning in students. The immediate assessment carried out through learning management system of the university. It was meant to check the learning at different levels with questions of different Bloom’s taxonomy such as Understanding (26%), Apply (16%), Analyze (37%) and Evaluate (21%). The score was also appreciable as 69% of students scored above 60% of marks (table 1).

<table>
<thead>
<tr>
<th>Marks (%)</th>
<th>Number of students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>7</td>
</tr>
<tr>
<td>80-90</td>
<td>11</td>
</tr>
<tr>
<td>70-80</td>
<td>20</td>
</tr>
<tr>
<td>60-70</td>
<td>31</td>
</tr>
<tr>
<td>50-60</td>
<td>20</td>
</tr>
<tr>
<td>40-50</td>
<td>7</td>
</tr>
<tr>
<td>&lt;40</td>
<td>4</td>
</tr>
</tbody>
</table>

Table1: Students’ score in knowledge assessment

3.3 Impact of Gallery walk
Students get a chance to practice debates and discussions, organize the contribution by each member and to make presentation rather than hearing the concepts presented by instructor. Through discussions and debate they improve their higher order thinking skills such as analysis, evaluation and creation. As the method involves moving around the class, it avoids the boredom of didactic lecturing. Cooperating in a heterogeneous group assumes a great deal of skills among students such as organizing the contribution by each member in a structured manner, self-motivation to learn or solve the problem themselves, motivating group mates to complete the task, a high level of self-esteem when they show case a problem solving capacity, helping the teammates, overall, an autonomy and confidence in learning.

3.4 Analysis of feedback survey

<table>
<thead>
<tr>
<th>S. No</th>
<th>Questions</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Gallery walk active learning is effective over traditional teaching style.</td>
<td>33%</td>
<td>51%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>This activity motivated me to study the entire topic in detail.</td>
<td>38%</td>
<td>44%</td>
<td>18%</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>I was able to learn the topics through my peers.</td>
<td>35%</td>
<td>45%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Learning objectives were fulfilled with this activity.</td>
<td>31%</td>
<td>55%</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>I was able to read the portions given to me before the discussion.</td>
<td>45%</td>
<td>33%</td>
<td>22%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 2: Analysis of feedback

The impact of activity on the students was analyzed with the help of feedback survey and it is clear that many students were benefitted to improve their soft skills which in turn improve their employability chances (Table 2). About 86% of students agreed that the learning outcomes were achieved by following the activity. The method was acceptable among students as 80% of them have recommended activity for other topics/courses. The activity was also considered superior for evaluating students’ quality as it considers knowledge and soft skills developed in students. It measures higher order thinking level among students rather than the traditional method where in memory or understanding was greatly considered. A positive social interdependence is the central basis for a cooperative learning as it provides the circumstances for each student being responsible for learning in other students and his knowledge deepened other group members. Students improve on their positive social skills such as sharing resources, support each other in learning and build on the group success [35].

4. CONCLUSION
Cooperative learning is a student centric activity to attain knowledge for students and to impart knowledge to group members. Students take the responsibility to learn and to teach fellow students. The instructor also has prominent role in implementing the activity from forming group, moderating the discussions, monitoring the progress and so on. The student’s resistant to be part of the activity also need to be considered by reflecting on the concerns they are going through while implementing. The instructor needs to create and maintain a sense of acceptance and positive environment in the class room so that students are allowed to express their apprehensions, complications and thoughts about cooperative learning [36]. As there are many approaches in cooperative learning strategy, the current implementation methods found to be accepted by the students. These observations, when combined with similar studies indicate a positive change in the teaching and learning process. The current findings also relevant to recognize the instructor’s understand of the University students. The cooperative learning contributes profusely for the development of academic as well as interpersonal skills among students. These types of learning strategy can empower the student to express their ideas.
without any inhibitive control of teachers. The discussions during class are also effective in relieving stress and anxieties, which could be inhibiting the learning capacity, among students. The faculties must adopt the best possible strategy to inculcate knowledge and soft skills in students. A systematic research need to be done to compare the effectiveness of various methods of cooperative learning.

5. ACKNOWLEDGMENT
The author owe special thanks to students of batch 2 in Heat and mass transfer course during odd semester 2018-19 for their kind cooperation in conducting experiments in teaching and learning.

REFERENCES


