

A Different Approach for Pedagogical Teamwork Practices in College Classrooms

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Abstract: *The objective of the paper is to project a different and innovative method for pedagogical teamwork practices in undergraduate college classrooms. Though, various methods are employed at present to perform teamwork trainings in certain academic environments in different forms, the one which is presented in this paper assumes a significant role in teamwork building activity as evidenced by the active responses from the students examined due to its different, effective and unique nature. A procedure for conduction and evaluation of teamwork activity in a classroom is also presented. A case study with first year undergraduate engineering students was carried out in a classroom and obtained results are interpreted and reported. A statistical analysis of the data obtained from the students is also presented in a histogram. Merits and demerits of the approach are discussed.*

Keywords: Team work, Pedagogical practices and Education

1. Introduction

In recent days, teaching and learning methods in academic environments are gradually changing everywhere and moving towards to identify various efficient processes. In work environments, teamwork is treated as an important and integral part to reach the objective. Some universities cite that teamwork is a graduate attribute. Literature reveals that such teamwork training is appear to be lacking in many academic programs [1-3]. Though, at certain academic places, teamwork trainings are given, which are not much innovative and effective. Hence this policy paper is planned for pedagogical teamwork trainings for undergraduate classrooms with a difference and such a type is not reported. Across the world it is believed that committed teamwork brings out efficient output in any work environment to realize its objective. If such a spirit of teamwork is cultivated in the young minds of students in academic environments, particularly in undergraduate classrooms, which will pave the way for creation of adaptive and efficient work force for the benefit of humanity. Though there are academic environments wherein teamwork practices are employed in different forms, the concise concepts of all of them are not much reported in literature. Keeping this in mind this article is planned and attempts to project one such unique and concise concept. This paper describes a different method of performing teamwork activity in an academic environment in teaching-learning process. Though the method appears to be simple, which is confirmed as new, different and effective as evidenced by the students of our undergraduate science and engineering classrooms. In this paper, the importance of team work in education and learning is presented briefly. A different approach for teamwork practice is discussed. A case study in applied physics subject was performed in our undergraduate engineering class room. Result of the case study was statistically analyzed using a histogram. Merits and demerits of the approach are discussed.

2. Teamwork in Education and Learning

Teamwork is the performance of an assigned activity by a

collection of people by mutual sharing of their knowledge, talents and thoughts to bring out an efficient solution for an assigned task. The output would be effective if the contribution of everybody is focused towards a common goal. Though in academic environments, teamwork is employed as a common practice in sports activities like: cricket, hockey, kabaddi, volleyball and foot ball and so on, such a collective action concept is not much employed in subject learning environments, generally, in many educational programs [4]. This may be either due to lack of awareness of benefits of teamwork or due to procedural constraints embedded in education system. Most of the present day subjects learning methods in educational institutions are individuals learning based where the spirit of teamwork is not much focused. Though the learning of subjects by teamwork is not possible at all environments, but could be practiced wherever possible in education system and such collective work habit can cultivate the responsibility on students to work as teams in work environments to find best solution for the objective. Teamwork/ groupwork learning is a form of united and cooperative learning by interacting among the students of that group, which develops student's knowledge in learning capacity, collaborative skills, critical thinking skills, communication skills, compromise skills, time managements and adaptive attitudes [5, 6]. These qualities are essential generally for all the students and most importantly for science and engineering students. Team works are generally headed by a leader. But in the approach presented in this paper does not have a leader among the students but all team students should put efforts equally as per the instructions under the direct supervision of the teacher who assigns and monitors the activity in classrooms itself to arrive at a solution collectively by the students groups for the assigned problem in an allotted time of about 20 to 30 minutes. This different approach of teamwork concept is examined by me in various classes of undergraduate courses of science and engineering classes and the students feedback at the end of the examination reveals that they felt a different constructive experience in doing this type of classroom exercises and expressed their views as the approach is bit new and different which they have almost never experienced anywhere in their academic activities in

their schools and other courses. Such a positive thinking and active participation of students with full involvement during the entire period of examination time mainly induced me to write this paper for the benefit of other students around the globe. This paper may also be utilized by the required teachers of undergraduate classrooms in teaching – learning process to improve the quality of education.

3. A Different Approach

A block diagram for grouping of students in a class room in a simple way is illustrated in Fig.1.

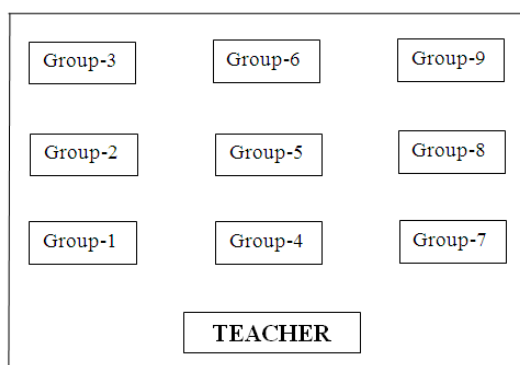


Figure 1: Block diagram for grouping of students in a classroom

During the class hour, without much disturbing the students sitting positions, students of each table may be assigned as such to constitute one group and similarly remaining groups in a class are also formed. Few students could also be shuffled at the discretion of the teacher if required. This could minimize unnecessary wastage of time in grouping of students. Such an arbitrary grouping of students could cultivate the adaptability with random students to act together for a common goal irrespective of their personal likes and dislikes, which is the real situation in work environments. Team/ group members need not be exactly equal in all the groups. A slight variation, if exist, among the strength of groups, which will not affect the efficiency of the activity much. For instance, some groups may consist of 4 students and some other groups may consist of 5 students may be permitted. This strength of about 5 students to form a group reported to be more effective functional strength [5, 7]. Once groups are allotted, a well prepared common question paper is to be distributed one for each group. The questions may be multiple choice objective type or problem solving type or critical analysis type or reasoning type or even mixed type, which is decided by the teacher based on the length of time available for the conduction of the test. But the answers must be expected in few lines is better in critical analysis questions for classroom tests. Now, in an allotted time (generally 20 – 30 minutes is sufficient for 10 questions) the groups are left free to interact themselves slowly without much noise among their group students. If possible, on creative questions set by the teacher, open book tests could also be permitted. Students feel very interesting and impressive on open book examination type. The tests may be closed book type also. The students should be informed strictly to follow the time schedule and return the papers within time given for them to

complete the assignment. The answers are expected to provide the analysis also in the question paper itself in the space provided under each question. After the allotted time for the examination is over, all the question papers with the answers therein should be collected from the groups by the teacher personally which avoids missing of question/ answer papers. For instance, for a class contains 60 students, approximately 10 groups may be formed with an average of 6 students for each group, therefore, only 10 question papers are sufficient to conduct the test for such a big class of about 60 students. To control and avoid malpractices of some mischievous students by incorporating the roll numbers and names of some absent students in the question/ answer papers in their group list with a view to help those students acting as proxy students, as soon as question papers are given to the groups, the teacher should move around the classroom and verify the names and roll numbers and number of students of all the groups written on the right top corner of the question paper by putting an endorsement on question paper near their names ensuring their personal verification writing total number of students. Finally, the teacher evaluates the paper in a short time as only there are 10 questions/ groups for instance. Teacher's time is much saved due to less number of evaluations.

The approach is experimented by me in various classes of undergraduate courses for science and engineering students in physics based subjects. The design of model question paper pattern for the students is given below in Fig.2.

Institution/ College name	
Subject code and subject name	
Roll Number and Names of students in a group 1)..... 2)..... 3).....and so on	Verification of students & Sign of faculty

Time: 30 minutes

1. Question?
 ANSWER SPACE (2 or 3 lines are generally sufficient for objective/ critical analysis questions)

2. Question?
 ANSWER SPACE

10. Question?
 ANSWER SPACE

Figure 2: Design of model question paper pattern

4. A Case Study and Statistical Data Analysis using a Histogram

In an undergraduate classroom for student strength about 65 students, a teamwork based tutorial was conducted by a method as narrated above for my physics classroom test. After the test, the following questionnaire was given to

students individually and asked to express their options freely and honestly. In fact, this test was conducted on another day after the teamwork test in the classroom was over to identify the feedback from the students. At that time only 34 students were present in the classroom. Hence, with their views the data was recorded and analyzed. The questionnaire was given below in table.1. The consolidated data is presented in table.2.

Table 1: Questionnaire

Question Index	Questions	Option	
		A	B
Q1	Do you like team work based tutorial in classroom?	Yes	No
Q2	Do you learn better in team work based tutorial or individual based work?	Team-based	Individual based
Q3	Have you ever experienced anywhere earlier similar teamwork tutorial as conducted in our physics classroom?	Yes	No
Q4	Whether teacher formed group is better or self formed group is better in writing group assignment tutorial?	Teacher formed	Self formed
Q5	Do you think that team based tutorials in classrooms are useful in your professional environment to mix with employees of different nature?	Yes	No

Table.2. Consolidated data

Questions	Q1		Q2		Q3		Q4		Q5	
OPTION	A	B	A	B	A	B	A	B	A	B
STUDENTS	34	0	33	1	9	25	12	22	34	0

For a statistical data analysis, a histogram was plotted using the consolidated data and presented in Fig.3.

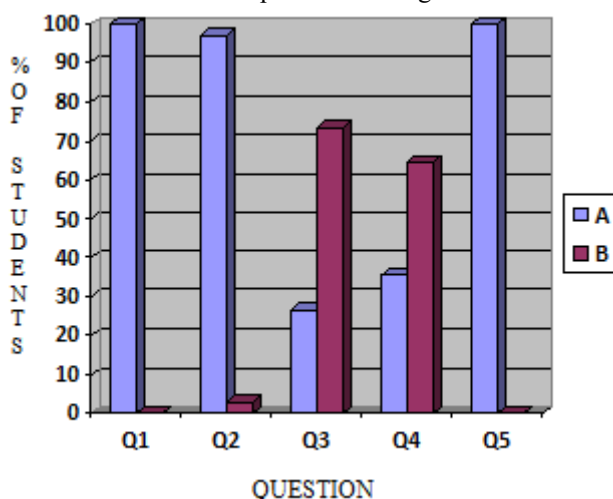


Figure 3: Histogram

The analysis of histogram reveals that for questions Q1 and Q5, the responses of “yes” are 100%, which reflects that all of them like this type of test and feel required and effective to enhance their knowledge. For the question Q2, the response is near 100%. But, for questions Q3 and Q4, there exist mixed representation of views among students. In our study, answer for question Q4 supports self formed group, which is

contrary to the observation reported in the literature [8, 9]. The histogram analysis helps to understand different views of the students in teamwork environment. Similar statistical data analysis may be conducted for other classrooms also.

5. Merits and Demerits of this Approach

Merits: By this method, students acquire the confidence of interacting with other students whether they like or not to find solution for a common goal set by the teacher, which promotes and prepare them for job/work environment to mix with employees characterized by spectrum of different natures towards finding a best solution for a common goal set by the employer. Individuals have the option of hearing the views and answers of others as well as exchanging with their ideas with one another on the objective whether they like or not on other matters with their associates. They also learn to analyze the answers of others and discuss with others on arriving at a right solution for the given problem by putting their knowledge and brain potential. By such exchange of ideas, every individual could also learn adaptive capabilities to the environment and sometimes they may realize about their mistakes also in their interpretation if someone points out or otherwise and compromise attitude may also developed. In such type of group examinations, the attitude of certain students about copying of the answers from neighboring students is highly rectified. In fact, it was observed during team activity that the students of the respective teams found to be highly focused on finding at some good solution as such solutions are competitive in nature with reference to other teams. Mostly, everybody in the team attempts to put their best efforts to bring out best possible solutions by exchanging their ideas and knowledge. Even poor knowledge students in the group also realize their inabilities about their knowledge and may try to improve their potential in the subsequent teamwork examinations on other topics. It is observed that this type of examinations highly attracted the attention of students of the groups to be focused within that group. This fact was observed by me in my experience of conduction of such examinations. Normally, best studying students found to lead taking the views of others to consolidate the result with the cooperation of others. This inherently cultivates the attitude of cooperative learning, which drives them to participate in future examinations with good spirit and enthusiasm [10-12]. If potential question paper is given, open book type examination also may be permitted, which the students may feel very challenging. This type of teamwork could be carried out even in larger and denser class rooms.

Demerits: Teamwork may cause problems also. Concerning with demerits, the possibility of non-cooperation may also exist among some students who have different opinions on solutions [13]. When they work in groups some students have no interest in doing quality work and were passive during teamwork activity. Whatever the active person says, mostly such passive persons agree with that and relax themselves. In addition, the possibility of identifying best individual students is lacking in this process as the entire credit goes to the group as a whole who formulates the best solution. Possibility of getting good marks by poor studying students

in a group is also possible, which is also a demerit. Since, it is a type of training offered for students to get practiced in team works, such demerits could be tolerated and compromised. Anyhow, compared to advantages, disadvantages are less in this approach.

6. Conclusion

The spirit of enhancing teamwork activity with a difference is the objective of this paper. A new method of teamwork practice was projected which may be employed in undergraduate academic environments. A procedure for examination and evaluation was given. A case study was presented. A statistical data analysis was carried out using a histogram. The merits and demerits of this approach are discussed. It is found that the method described here found to be effective and unique. New method projected here bring the young minds to act together with a highly focused attitude on the assigned objective to arrive at a best solution for the defined problem by sharing their brain potential and their intellectual academic calibers in a classroom environment.

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Author Profile

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