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## Peer assisted team-based learning in undergraduate dental education

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### ABSTRACT

The teaching system has seen an evolution in the same regard, from blackboard teaching to whiteboard teaching to smart board teaching. We now step foot into a new era of teaching with fresher minds to influence and shape. The present study mainly focuses on a rather new method of teaching called 'Peer lead Team-based learning'. The method focuses mainly on the students and their active participation in the involved topic. To conduct the study, a batch of dental students were taught and were later assessed. The students thus specified are undergraduate students who were pursuing their 2<sup>nd</sup> year BDS at Saveetha Dental College and Hospitals. The total number of students that were considered was about thirty-three students. The students were of the age group of about 19-23 years. The subject that was imparted to these students in this method is Dental Materials which was initially perceived to be difficult by the 2<sup>nd</sup> year candidates. On completion of the period of study, the students were asked to take up an exam in the usual pattern prescribed by the University. The marks thus obtained were analysed with the previous tests and a questionnaire was filled by each student to obtain their perception towards this teaching system. On the analysis of the test scores, it was obtained that there was a significant difference in the average class score. There was a mean difference of about 8-11 marks on analysis of various tests. Thus this proves that the teaching system is immensely efficient. The responses from the questionnaire were assessed and it proved that the teaching system is welcomed by the student community. The teaching system is successful in a dental curriculum and under ideal conditions the system would be successful in other courses but has to be tested to confirm the same.



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### INTRODUCTION

Teaching is a very important aspect in any person's career as well as their life. Teachers play an important role in shaping and moulding a person to be presented to society. With the developments of science and technology, students and teachers have strived to be their best. Teacher support is positively related to overall peer liking and prosocial behaviour (Skinner *et al.*, 1993).

The success of a concept that has been imparted by a teacher is determined by various factors (Cantrell, P *et al.*, 2003) but majorly by two things,

by the quality of the content that has been imparted to the students and also the method through which the content has been delivered to the students. There are a few external and internal factors that affect this to a larger extent. The various internal factors have been demonstrated above and also student cognitive skills (Gage, N. L. 2008). The external factors which affect the success are peer environment, teacher peer interaction and a fluent chain of command. Extrinsic factors may also be influenced by the socioeconomic background of the student and support from family.

Teachers through ages have tried to alter, influence and affect their factors to improve the learning experience and to have maximum efficacy with the same. The teaching system has seen an evolution in the same regard, from blackboard teaching to whiteboard teaching to smart board teaching. We now step foot into a new era of teaching with fresher minds to influence and shape. With the growing generations, our methods of teaching should also change. Another factor that always has to be kept in mind while designing a new study method is the reach of the method and the age group to which it can be applied. A study method used in the Montessori system will work well in a college set up, but it does not work the other way around, and hence adequate precautions should be taken by the teachers. There are various teaching methods that already exist such as Problem based learning (Barrows, Howard S 1994).

The present study mainly focuses on a rather new method of teaching called 'Peer lead Team-based learning' (Kawas, S. A., & Hamdy, H. 2017). The method focuses mainly on the students and their active participation in the involved topic. It is one of the few methods that allow students to manoeuvre through the course material in the method which they see fit along with the assistance from an expert from the field. The use of this method can be employed with suitable modifications in professional and non-professional courses. The aim of the study was to improve the education system and to make it easy and approachable to all members of the student community.

## MATERIALS AND METHODS

To conduct the study a batch of dental students were taught and were later assessed. The students thus specified are undergraduate students who were pursuing their 2<sup>nd</sup> year BDS at Saveetha Dental College and Hospitals. The total number of students that were considered was about thirty-three students. The students were of the age group of about 19-23 years. The subject that was

imparted to these students in this method is Dental Materials which was initially perceived to be difficult by the 2<sup>nd</sup> year candidates.

The entire course curriculum was carefully divided and covered by an expert within 4 days. The lectures were broken down into smaller periods to ensure that the attention of the student did not deviate. Once a topic was initially covered, the students were divided into groups of 6, which was at random. The groups were asked to choose a leader for that particular session. After each topic, the students were asked to go through the course material discuss among the group and frame appropriate questions for the same. The leader then had the opportunity to go through all the topics that were covered in that session, thus improving the leader's knowledge as well as that of the team members. The framing of questions was also a team effort lead by the team leader. This was asked to be done in a stipulated amount of time. Once the time was over, each team was asked to rise and pose questions to the other teams, and a few rounds of such learning was conducted. This helped to strengthen the bond among the candidates and also to bring out the team spirit among them. Each morning before the class for the particular day was started, a short test was conducted to refresh and retain the topics that had been covered in the previous days. Once the course curriculum was entirely completed, the students were assessed with the same exam pattern in which they would appear for the university exam. The results were obtained after correction by the faculty who had also corrected the previous tests before the PLTBL activity. The results thus obtained were analysed with the experiments conducted with the same exam pattern.

Once the graded papers were returned to the students, a questionnaire was passed to accessed how the particular teaching system helped each one of them to improve their knowledge and other factors that were involved. This questionnaire had questions which ranged from their understanding of the subject to the response to their peers after the activity. The questions were framed with clarity and with no room for misinterpretation. The accessed answers were checked and tallied and later analysed.

## RESULTS

On analysing the test results that were obtained before and after the said activity, a great success of the particular system was observed. The test scores were statistically analysed with previous tests through a paired t-test. It was analysed with two different test scores, hereafter regarded as test A and test B. The test which was conducted after the activity labelled as test C. Table 1 shows the

**Table 1: Scores of Various tests**

Candidate number	Test A	Test B	Test C
1	49	43	67
2	47	37	60
3	46	40	47
4	47	54	57
5	0	0	11
6	41	46	54
7	47	0	41
8	61	66	69
9	27	26	27
10	56	46	53
11	31	14	23
12	16	13	17
13	7	14	23
14	36	36	46
15	51	50	69
16	43	24	51
17	17	37	41
18	26	20	39
19	13	7	26
20	39	61	61
21	32	44	44
22	14	26	31
23	31	66	50
24	27	53	51
25	29	54	70
26	33	46	47
27	73	74	73
28	39	54	59
29	53	40	61
30	26	66	73

scores acquired by various candidates in the various tests. The test marks are equated out of 100 marks.

Between Test A and Test C, the mean difference was observed to be 11.91 marks which are a huge difference, with a p-value of 0.049 and is thus statistically significant.

Between Test B and Test C, the mean difference was observed to be 8.61 marks which are also a considerably large difference, with a p-value of 0.0620 which is not significant.

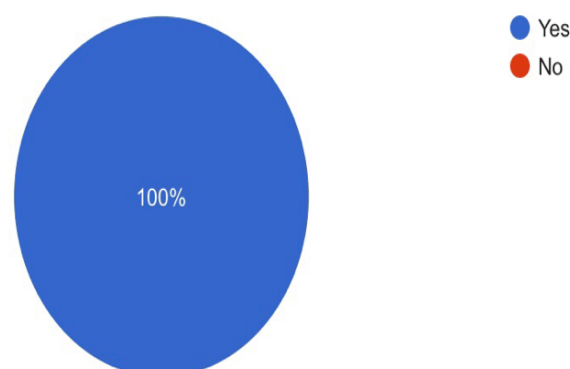
The questionnaire that was involved in the study consisted of the following questions:

1. Was your attention span better with this exercise
2. Did the team-based learning help you with your preparation
3. Would you prefer this method of teaching over others
4. How effective would you rate the team-based learning to be over conventional methods
5. Did the team-based learning help you with bonding among peers

6. Are you better versed in the syllabus after the exercise

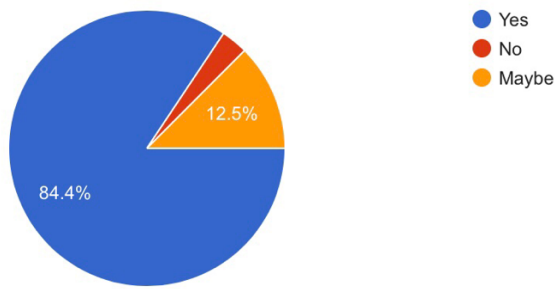
7. In what ways did the team-based learning help you

8. Rate your improvement with the subject knowledge



**Figure 1: Response to question on attention span**

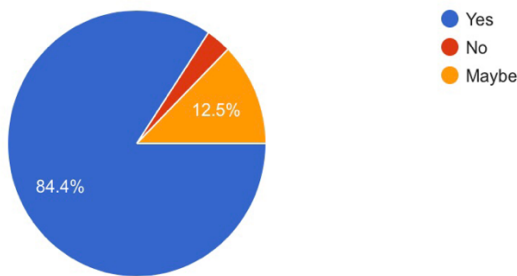
The results that were thus obtained were tabulated in the form of charts to analyse the same. The most significant charts have been represented below in graphs 1,2,3 and tables 3 and 4.



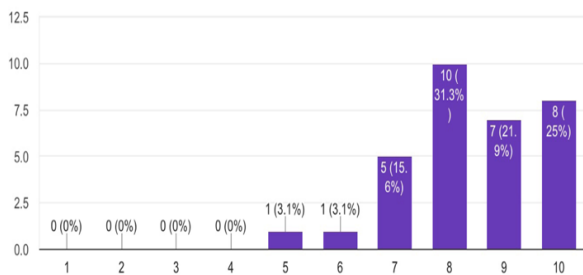
**Figure 2: Preference over other teaching methods by students**

**DISCUSSION**

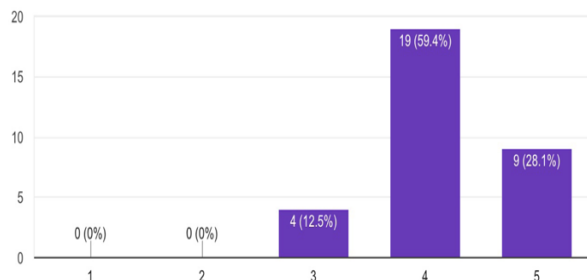
has been used in such as medicine and business. For example, TBL was utilised by an of interprofessional health in the National Academy of Practice (NAP), which resulted in a very learning important skills for interprofessional collaboration (Rider EA, Brasher V 2006). However; the effectiveness of a TBL dental education had investigated before our study, which was a catalyst for our efforts. Moreover, the use of a peer lead team-based learning had never been used in a dental setup.



**Figure 3: Response to bonding among peers after the exercise**



**Figure 4: Effectiveness of system as rated by students**



**Figure 5: Response to improvement in subject knowledge.**

While setting up the groups for the new teaching exercise, it was made sure that there was no conflict of interest within the group of students as such. This has also played an effect on the results of the study. Groups intact from experiences have also used by others (Michaelsen KL. 1998).

The present research portrays the success of a teaching and learning system. It is clear from the analysis from Table 1 that the study method is significantly beneficial to the students. The pattern of the different tests whose marks were considered was the same and the correction method employed was also the same, and hence the success of the teaching system cannot be disregarded by these pretences. The portion which was tested in Test C was much more significant in comparison to Test A and Test B, and hence the results are overwhelmingly good.

Technology has started to play a major role in medical education, this particular method does not employ much technology and hence the small incidents of diversion can also be avoided. Thus, With the advent of technology-based learning in the medical field (Thierry Volery, Deborah Lord, 2000) this is a rather less consuming process.

From Graph 1, it is evident that this system has enhanced the attention span of a candidate which is beneficial to the student as well to the teacher. There have been various studies which have proven the influence of visual attention span children towards reading (M.L. Bosse, *et al.*, 2009), the same can play a larger role here due to the quantity and quality of the information being imparted.

From Graph 3, it is clear that this activity not only improves the understanding of the subject but also the binding among peers. This is an equally important aspect of education as is the education which is imparted. This has been implicated with online learning (Heeyoung Han and Scott D. Johnson 2012), but the same has a larger role to play in physical class-based learning.

The limitations of the study include that the group that was chosen was rather small and hence the results have to be checked on a larger scale. The same study pattern should be compared among various teaching faculty to estimate an appropriate success rate of the system. With these factors varying, a definitive conclusion cannot be withdrawn on the precise success rate. But the success of the system can be assured irrespective.

Thus the various aspects that have been described show the success of the study system and hence are advised to be integrated into the various streams of education for the betterment of the

education system as well as the student community and therefore the leaders of tomorrow.

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