

## Structured group discussion versus problem based learning a comparison in Medical Education

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### Abstract

We compared the Problem based learning tool to our proposed Structured Group Discussion. Methodology employed was students were divided into two groups equally. 50 each students were chosen for the study for each group. The Pretest was carried out first on previous day. Then for structured group discussion structured objectives along with the related problem were supplied to students a day before the discussion. And for Problem based learner group a related problem on the topic of discussion was supplied before a day of discussion. Then the sessions of discussion were carried out next day. And then a post test was carried. And data was generated on the scores obtained by each group of students.

Data for the pre test scenario was non significant for our groups, Group A the Structured group discussion Group and Group B the Problem Based Learner Group ( $P > 0.05$ ). Post test scenario was very effective ( $P < 0.001$ ) for the Group A versus Group B. Mean  $\pm$ SD values for Group A-  $10.2 \pm 3.19$  and for Group B ( $6.92 \pm 2.75$ ).

This study has shown high significance over a one of the learning tool the PBL i.e. Problem Based Learning.

**Keywords:** SGD- Structured Group Discussion, PBL- Problem Based Learning.

### 1. Introduction

Medical education in India is undergoing a rapid, gross, thorough and progressive change in teaching modalities at par and sometimes above the western standards which are in practice at their respective universities. In India the Medicine and Dentistry both has one year of their studies for basic sciences. Biochemistry the subject of research, knowledge the base of further education in respective field is being taught by traditional methods of teaching and learning tools like didactic lectures, Laboratory Practical's and tutorials as well as by newer and western methods of teaching and learning tools.

The rationale of our study is to bring out a new concept, new modality of teaching and learning tool which will help students as well as faculty to take the studies as easy as possible. We studied the different ways of teaching learning modalities like,

#### 1.1 PBL- problem based learning

Problem-based learning (PBL) is a student-centred pedagogy in which students learn about a particular subject through the experience of related problem solving.

Students learn both thinking strategies and domain knowledge. This thought and concept was developed at the McMaster University Medical School in Canada in the 1960s. [1]

#### 1.2 Inquiry-based learning

This mode of teaching includes posing questions, problems or scenarios, instead of simply presenting established facts or portraying a smooth path for gaining knowledge. The process has to be assisted by a facilitator. Inquiry-based learning is where people were required to memorize information from instructional materials. The philosophy of inquiry based learning finds its antecedents in constructive learning theories. [2, 3]

#### 1.3 Instructional Models

This type of instructional Models represents the broadest level of instructional practices and presents a philosophical orientation to instruction. Instructional Models are used to select and to structure teaching strategies, methods, skills, and student activities for a particular instructional emphasis. Instructional models are related to theories about how we learn. Some examples include:

behaviourism, cognitivism, constructivism, and connectivism.

#### 1.4 Structured group discussion

In case of structured group discussions, general topics are given to group of participants and discussion is expected. There are not selected leaders to lead the discussion in this case and different participants can have different views about the given topic.

#### 1.5 Structured Focus Group

In this type of structured focus group it is a facilitated group discussion in which open-ended questions are asked in a way to trigger discussion amongst a panel of participants. More effort is given to reducing the structure of the content so that the information is gained from the participants rather than being determined by the questions asked.

#### 1.6 Group discussion

A group discussion refers to a set of students/ persons brought together to express their opinion and to the subsequent exchange of views on the allocated subject.

Above are mentioned a few types of teaching learning modalities which are in use.

The approach of students towards learning depends upon learning styles, environment and context. Main types of learning styles are surface, deep and strategic. [4]

Deep learning identifies the general principles, integrates material across subjects and relates ideas to evidence. Deep learning can be achieved.

- 1) By forming course objectives which encourage higher intellectual skills,
- 2) By developing appropriate attitudes,
- 3) By reducing didactic methods and increasing small group and self directed learning,
- 4) By interactive approach that encourage questioning, and
- 5) By developing end of firm assessments that reward deep learning. [5]

After going through all above aspects of teaching and learning tools we came to our rationale the aim the new concept for teaching as well as learning that is the Structured Group Discussion for medical and dental education.

In the present scenario of teaching learning tools and methodologies we hypothesize that it will be a better tool for teaching and learning methodology.

Structured group discussion in context with clinical biochemistry and general biochemistry can be an important teaching and learning tool to achieve a better and deep learning for undergraduates of medical and dental education. Clinical biochemistry is tool which integrates basic science with clinical science.

## 2. Materials and Methods

100 1<sup>st</sup> BDS students from Sharad Pawar Dental College Sawangi (M) Wardha were chosen for the study.

A popular topic from their syllabus Goitre from Hormones was discussed in two groups of SGD learners and PBL learners.

**Group A-** Structured group Discussion group.

**Group B-** Problem based learner Group.

A pre test and post test comprising questions on the topic was carried out at the start and at the end of the discussion of the topic.

**Study design:** Prospective analytical study

**Sample size:** 50 students in each group.

**Sampling technique:** Randomly selected regularly attending 100 students were divided into two groups of 50 each.

**Methodology:**

To begin with the study I applied for clearance through Institutional ethical committee of Jawaharlal Nehru Medical College and I received a clearance from Institutional Ethical Committee.

100 regular Ist BDS students were chosen for the study. They were divided into two groups of 50 each as

**Group A:** Structured group discussion group

**Group B:** Problem based learner group

Students were again divided into 10 students per group further, for easy communication with each facilitator.

On previous day a Pre-test from the topic on Goitre of Hormones for Group A and Group B was carried out separately and papers were distributed separately containing questions and later on collected separately for Group A and Group B.

Data was obtained after assessment of their answer sheets and placed separately.

Topic of Goitre from hormones was discussed as common topic for Group A and Group B.

Methodology employed for group A was Structured group discussion where structured objectives from the topic were supplied along with the related problem on the topic previously before a day of start of discussion assuming students will discuss the points in the class after going through the topic at their home previously. Next day the topic was discussed with the problem based case and the structured objectives were considered for the discussion by students with the help of facilitators.

We assumed this will have better impact over the learning of the topic.

Methodology employed for Group B was Problem Based Discussion where a problem concerned with the topic of discussion was supplied previously before a day of start of discussion assuming students will go through the problem /a case and think over it relating to topic then they will go through the topic at their home previously. Next day a Problem based discussion was carried among the students by facilitators for the problem/ a case given to them.

Then the post test was carried out.

The data was obtained after assessing the answer sheets of respective groups.

**Annexure I**- Contains Structured objectives for Group A

**Annexure II** – Contains Problem based scenario.

## Annexure I

### Structured Group Discussion:

1. Definition of hormones
2. Classify hormones based on the chemical nature and mechanism of action
3. Mechanism of action of Group I hormones
4. Mechanism of action of Group II hormones
5. What are G proteins
6. cAMP as  $\text{I}^{\text{nd}}$  messenger
7. PIP/ Ca as  $\text{I}^{\text{nd}}$  messenger
8. Functions of thyroid hormones
9. What is hypothyroidism
10. Signs and symptoms of hypothyroidism
11. What is hyperthyroidism
12. Signs and symptoms of hyperthyroidism
13. Normal levels of T3, T4 and TSH
14. Difference between hypo and hyper thyroidism

## Annexure II

### Problem based learning scenario:

A 57 year old woman visited her family physician complaining of chronic fatigue and sluggishness for a number of years, this was her first visit to her doctor for 5 five years. On questioning a history of constipation and feeling cold was elicited. She had two adult children: her last menstrual period had occurred some 7 years previously. A sister had pernicious anaemia and a maternal aunt had a thyroid problem.

On examination patient was moderately obese. She answered questions slowly, with little change of expression, her voice sounded coarse, and her tongue appeared moderately swollen. Some puffiness around her cheeks was also evident. Palpation of the neck revealed that her thyroid gland was rather firm in consistency, and modestly enlarged. Her blood pressure was mildly elevated and her deep tendon reflexes were delayed. Some clinical findings of hypothyroidism were observed. On basis of history and clinical examination her Doctor labelled as she is a case of hypothyroidism.

## 3. Observations and Results

The study for the project was carried out for the 1<sup>st</sup> BDS students of 2015 batch students. 100 students from Sharad Pawar dental college were chosen for the study. They were grouped as follows after a few students fallout.

**Table No.1: Distribution of students in two groups**

Group A- Structured Group Discussion	Group B- Problem Based Learner
No of Student -48	No of Students -49

**Table No. 2: Marks and No of students for Pre Test**

No. of Students Group A	Pre Test Group A Marks Out of 20	No of Students Group B	Pre Test Group B Marks Out of 20
33	≤5 marks	36	≤5 marks
15	>5 and ≤10	13	>5 and ≤10
Nil	>10 and ≤15	Nil	>10 and ≤15
Nil	>15	Nil	>15

Table No. 2 shows that in pretest students scored almost similar marks compared to each group. The P value also came to be non significant.

**Table No 3: Pretest students of Group A and B Mean and SD**

Pre Test Group A	Mean ±SD	Pre Test Group B	Mean ± SD	P Value
No of students 48	3.72± 1.66	No of students 49	3.2± 1.89	> 0.05
				NS

NS: No significance

**Table No 4: Marks and no of students for Post Test**

No. of Students Group A	Post Test Group A Marks Out of 20	No of Students Group B	Post Test Group B Marks Out of 20
6	≤5 marks	16	≤5 marks
17	>5 and ≤10	29	>5 and ≤10
25	>10 and ≤15	4	>10 and ≤15
Nil	>15	Nil	>15

**Table No. 5: Post test Group A and B Mean and SD**

Post Test Group A	Mean ±SD	Post Test Group B	Mean ± SD	P Value
No of students 48	10.2± 3.19	No of students 49	6.92± 2.75	p< 0.001
				Significant

Table no 4 shows that the students from Group A scored well marks. More students from Group A scored more than 10 marks as compared to Group of Problem based learner Group B. The mean and SD values for Group A and Group B were as Group A- 10.2± 3.19 and Group B- 6.92± 2.75. The p value is also very significant (P< 0.001).

This shows that the teaching learning method of structured group discussion is of very much importance.

**Table No. 6: Feedback from Group A- Structured group discussion**

Question No.	SD	D	N	A	SA
1	4	1	9	30	4
2	6	5	5	28	4
3	2	5	7	29	5
4	4	4	9	26	5
5	5	3	6	28	6
6	5	4	6	29	4
7	4	5	7	27	5

(SD-Strongly disagree, D- Disagree, N- Neutral, A- Agree, SA-Strongly Agree)

Table no 6 shows that students from this group have given positive thought for creating interest in self learning by structured group discussion type of learning methods. Students of this group have shown that this is helpful for better understanding. Students have agreed to that this type of learning is more practical. Students have voted for this type of learning has created enthusiasm and encouragement for self learning. Students have voted that this type of learning is helpful in enhancing performance in the examination. Students voted for this type of learning for help in applying the knowledge in real life situations. Students also voted for getting early awareness about the topic.

Students also opined about advantages that structured group discussion helps in self and fast learning, for better understanding, creating interest, improving knowledge and for better interaction.

Students opined about disadvantages of structured group discussion that self understanding is difficult; it creates lots of doubt, extra knowledge given by teachers during lectures is not possible, not all students are interested about this type of learning and can create disinterest in self learning.

Suggestions given by students of structured group discussion for regular teaching are should be weekly only, should be more interactive, should be in disciplined manner and topic should have been taught earlier.

**Table No. 7: Feedback from Group B- Problem based learning**

Question No.	SD	D	N	A	SA
1	5	6	23	14	1
2	5	13	20	11	0
3	6	6	22	13	2
4	5	9	20	14	1
5	5	9	23	11	1
6	7	7	12	23	0
7	5	7	20	17	0

(SD-Strongly disagree, D- Disagree, N- Neutral, A- Agree, SA-Strongly Agree)

Table No. 7 shows that more than half of students from problem learning group opined about to remain neutral about creating interest for self learning, more than 26% disagreed about creating interest and 20% agreed for this.

For better understanding about 46% remain neutral, 30% disagreed and 20 % agreed for.

For more practical than other modes of learning 50% remain neutral, 30% disagreed and 18% agreed for.

For creating enthusiasm and encouragement for self learning 47% remain neutral, 35% disagreed and 22% agreed.

Enhancing performance for self learning 58% remain neutral, 35% disagreed and 7% agreed.

For applying knowledge in real life situations 30% remain neutral, 25% disagreed and 45% agreed upon.

For getting early awareness about topic about 50% remain neutral 25% disagreed and 26% agreed upon.

Students wrote about advantages of Problem based learning that encourages self learning, helpful in getting acquainted with topic, creates enthusiasm and clinical understanding is good.

Students wrote about disadvantages about Problem based learning that it doesn't clear concept, can't enhance performance in the examinations, delivers less theoretical knowledge, and topic can't be understood properly.

Regarding suggestions to include Problem based learning in regular teaching students opined that no need to include, not beneficial, waste of time, difficult to cover whole lesson by this method and complete topic is not covered.

#### 4. Discussion

The present study of "Comparative analysis of structured group discussion versus problem based learning as a learning method for undergraduates in biochemistry" was carried out at Sharad Pawar Dental College and hospital for 1<sup>st</sup> BDS students for 2014 batch.

Results of this study showed the method of teaching by structured group discussion is statistically highly significant over the method by Problem based learning group. This study strongly supports the use of this method in conjunction with traditional didactic lectures. Similar type of results was obtained by group of workers where results provide strong support for the use of structured group discussion in conjunction with lecture notes over traditional didactic lectures. [6] Small group discussion has helped students to overcome the barriers and students have asked doubts with free mind. This type of discussion might have enabled the attitudes of students to be highlighted and may have modified through hearing the views of others. In addition students may have offered each other educational support with the help of facilitator. Similar type of results have been shown by authors DR Kelly, DE Cunningham, P McCalister *et al*, [7] Another outcome of this study is faculty training and development which strengthen the quality of teaching in future. The drawback of the study is that 1<sup>st</sup> year students may not match with the teaching learning method initially. At this stage students are more dependent on the teacher. Similar type of results has shown by authors like Dr. Kedar Joshi *et al* [8].

#### 5. Conclusion

Conclusion is very clear, in pretest it is seen that comparison is not significant ( $p > 0.05$ ). Mean and SD for Structured Group Discussion group and for Problem Based Learner Group are more or so similar and significance is not achieved for.

Conclusions of Post Test studies shows Structured Group Discussion compared to Problem Based Discussion is statistically highly significant ( $p < 0.001$ ) way of teaching learning modality.

Feedback shows that more no of students from structured group discussion group opted for a way of Agreeing towards implementation and including in regular teaching.

Student from Problem Based learners Group opted to remain neutral for any suggestions. And very few students opted for agreeing towards implementation in regular teaching.

At institutional level this mode of learning can be used as routine method at appropriate intervals for teaching Biochemistry in Ist BDS students. This type of teaching methodology can create interest among students, learn meaningfully, can change their attitude towards learning and students will offer educational support to each other in better way. Reform is the need of hour to bring change in Medical Education.

Though the results are very enthusiastic a study on large number of students is required for coming to a proper conclusive point.

### Acknowledgements

I sincerely thank to all students of Ist BDS 2014 Batch for their participation, my all teaching staff and my guide Dr. Tripti Waghmare Professor in Physiology for her valuable and timely support.

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