

The Effectiveness Of Learning Through Argumentation Method In Developing Clinical Analysis Skill With Case-based Learning

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Introduction - The students lack analytical thinking in case based study to arrive at a diagnosis. They cannot analyze the given case based study efficiently applying the knowledge of Physiology. They don't arrive at the correct diagnosis hence – 1) cannot attempt case based questions efficiently, 2) lower grades 3) Will not be able to diagnose patients efficiently. When in practice they will advise a long list of investigations, the time gap between arrival of patients and initiation of management will increase due to poor analytical ability for arriving at probable diagnosis. Hence the health care system will slow down and the number of unsatisfied patients will increase.

Objectives -

- 1) To compare the scores of students by traditional individual problem solving method and Case based learning (CBL) by argumentation method
- 2) To determine the satisfaction of students about CBL by argumentation method
- 3) To determine the confidence of faculty in conducting the CBL by argumentation method

Material methods –

Study design –Experimental Comparative study

Study location – Dr. Vasant Rao Pawar Medical College Hospital and Research Centre, Nashik

Sample size – 120 Phase I MBBS students (purposive sampling)

This study was conducted in 105 Phase I MBBS students after explaining them the procedure in detail and obtaining a written informed consent. Three modules of case based study were prepared. The score of students in individual problem solving method was calculated after exposure to the 3 case scenarios in 3 different sessions one week apart. For learning by argumentation method each case based module similar to the previous cases were designed. The case based discussion by argumentation method consisted of 4 hrs. divided into two sessions of 2hrs each. The students were divided into small groups of 7. A Faculty was present to supervise and guide the students. In Learning by argumentation method the first session consisted of self-directed learning to enable students to construct their knowledge. In the second session the students did the concept mapping of argumentation based on Toulmin's model of argumentation. The principal investigator designed the case scenarios and evaluation of the concept map was done by two assessors based on the rubric developed for assessment. The final marks were decided by the consensus of both the assessors. The scores in individual problem solving and argumentation method were compared. A formative assessment on case based questions of 30 marks was also conducted. The Qualitative data on confidence of faculty members in using the method and the satisfaction level of students was determined using a questionnaire and 5 point Likert scale.

Table 2 - Formative assessment –

Sr. No.	Marks out of 30	No. of students	% of students
1	Marks ≥ 21	80	76.19%
2	Marks < 21	25	23.81%

Table 3 - Questionnaire for students to evaluate – CBL by argumentation method

Frequency distribution % (n)

Sr. No.	Question	1	2	3	4	5
1	The clarity of instructions to the students.	00 (0)	00 (0)	9.52 (10)	14.28 (15)	76.19(80)
2	The productivity of CBL– argumentation method.	00(0)	1.90 (02)	7.61 (08)	19.04 (20)	66.66(70)
3	The quality of cases	00(0)	00(0)	4.76 (05)	19.04 (20)	76.19(80)
4	The tutor stimulated us for self-directed learning	00(0)	0.95 (01)	3.80 (04)	14.28 (15)	80.95 (85)
5	The CBL by argumentation method helped us to link the subject to real life problems	00(0)	4.76 (05)	4.76 (05)	28.57(30)	61.90 (65)
6	The CBL by argumentation method increased our subject understanding	00(0)	00(0)	7.61 (08)	4.76 (05)	87.61 (92)
7	The CBL by argumentation method increased our clinical analytical skill	00(0)	0.95 (01)	6.66 (07)	6.66 (07)	85.71 (90)
8	The CBL by argumentation method increased our confidence	1.90 (02)	2.85 (03)	12.38(13)	16.19 (17)	66.66 (70)
9	The CBL by argumentation method enhanced our ability to work in groups	00(0)	1.90 (02)	4.76 (05)	19.04 (20)	74.28 (78)
10	The CBL by argumentation method was well organized	00(0)	00(0)	4.76 (05)	4.76 (05)	90.47 (95)
11	The CBL by argumentation method is more effective than traditional case based method	00(0)	00(0)	3.80 (04)	2.85 (03)	93.33 (98)
12	The CBL by argumentation method should be incorporated in our T-L methods	00(0)	00(0)	0.95 (01)	4.76 (05)	94.28(99)

Table 4 – Questionnaire for faculty to evaluate – CBD by argumentation method –

Frequency distribution % (n)

Sr. No.	Question	1	2	3	4	5
1	The CBL by argumentation method enriches student learning.	0(0)	0(0)	0(0)	0(0)	100 (5)
2	The CBL by argumentation method helps student to share their knowledge.	0(0)	0(0)	0(0)	0(0)	100 (5)
3	The CBL by argumentation method develops critical thinking in students.	0(0)	20 (1)	0(0)	0(0)	80 (4)
4	The CBL by argumentation method sharpens clinical analytical skill in students.	0(0)	20 (1)	0(0)	0(0)	80 (4)
5	The CBL by argumentation method helps the student to acquire an optimal depth of knowledge.	0(0)	40 (2)	0(0)	0(0)	60 (3)
6	I am well trained to conduct the session using argumentation method.	0(0)	0(0)	0(0)	0(0)	100 (5)

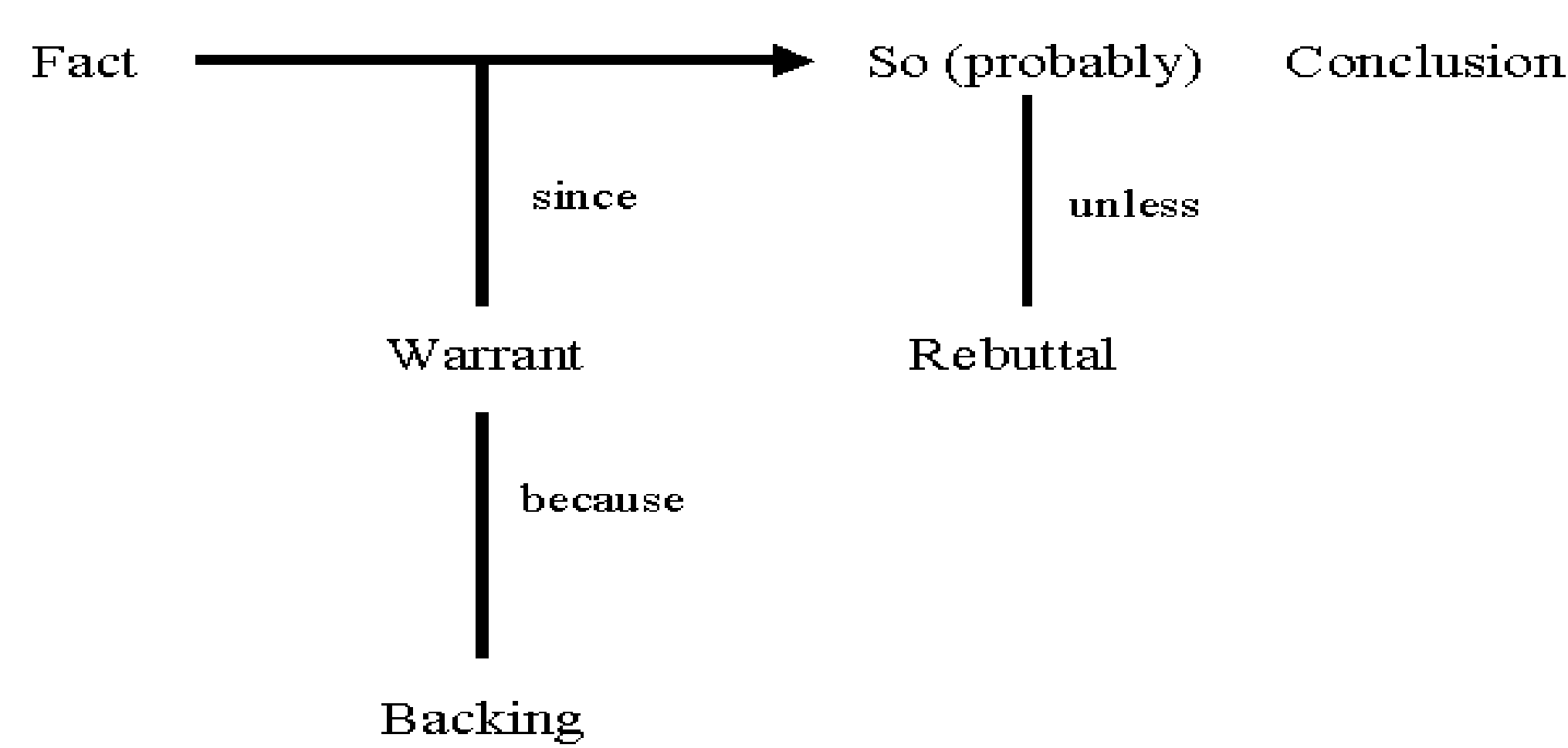
Results – The scores of students in CBL by argumentation method in all three modules is statistically significantly more than the scores by individual problem solving method. In a formative test conducted on case based questions 76.19% students scored more than 70% marks.93.33% students were of the opinion that CBL by argumentation method is more effective than traditional case based learning method and 99% students strongly agreed in incorporation of this method in the regular TL methods. All the faculty members were satisfied with the training they received for conducting the CBL by argumentation method. All were confident in the new method of case based learning method.

Discussion - The case based learning by argumentation method positively effects the clinical analytical skill of the students. It also has a positive impact on clinical problem solving performance.

Conclusion – Assessment of clinical reasoning skills by argumentation method helps to assess the outcome and the process of clinical reasoning by the student. Thereby increasing their clinical analytical skill. The students had a very positive approach towards the new method and vouched for its incorporation in the regular T-L method.

References -

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Toulmin's model

Data analysis – Data analysis of Quantitative data was done by paired t test. The Questionnaire was analysed by proportions and percentages.

Rubrics for assessment¹

Score	Criteria
6	The claims are related to the fact, clear and complete with well explained backup and warrant
4	The claims are related to the fact but are not completed with appropriate backup and warrant. Much is left for the reader to infer but the writer's intent can be determined.
2	The claims are related to the fact but are not completed with appropriate backup and warrant. Much is left for the reader to infer and the writer's intent cannot be determined due to lack of specificity.
0	No claim / claim not related to fact/ Unclear claims

Observations -Table 1 - Comparison of scores by Individual problem solving and argumentation method

SR. No.	Case based Learning method	Mean	Standard Deviation	p value	Significance
1	Individual problem solving 1	13.82857143	3.98182685	< 0.0001	Significant
	Argumentation method 1	18.533	3.703		
2	Individual problem solving 2	14.0952381	3.65198526	< 0.0001	Significant
	Argumentation method 2	18.93333333	3.584868485		
3	Individual problem solving 3	13.80952381	4.024194229	< 0.0001	Significant
	Argumentation method 3	20.26666667	2.185030658		

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