

## Introduction of a modified interactive tutorial in Microbiology among II<sup>nd</sup> Phase MBBS students

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### Abstract

Tutorials are very significant methodology and usually used as a method of reinforcement of teaching learning process. Tutorials have mostly become teacher-led and students usually remain passive. There is a need to modify tutorials so that students are actively involved in learning process. The modification should aim at active involvement and alertness in class. The study was conducted so as to introduce a modified interactive tutorial, to compare it with the conventional method and study its perception among students.

**Materials and Method:** 91 II<sup>nd</sup> phase, 3rd term medical students underwent both conventional tutorial and modified interactive tutorial. The impact of tutorials was assessed by pre and post-test design. Student feedback on the efficacy and benefits were obtained by 5 point Likert scale questionnaire.

**Results:** The pre and post test scores of both novel and conventional tutorial were compared by paired t-test and was found to be statistically significant ( $p=0.0001$ ). When post test scores of both were compared by unpaired t-test,  $p$  value was statistically significant ( $0.05$ ). 74% of the students favored novel method as their future tutorial method. Student cited arousing interest among learners, equal attention and involvement of all students, better understanding of subject, opportunities for group learning, improving presentation skills, greater interaction and active learning as best aspects. Time constraint was pointed as the negative aspect by students

**Conclusions:** Novel tutorial was found to be more effective than conventional. This novel interactive tutorial can be used to improve learning outcome and soft skills among students.

**Keywords:** Modified interactive, Tutorial, Microbiology

### Introduction

Tutorials are often used as a major method of teaching learning strategy in pre and para clinical MBBS subjects. Medical education is going through a paradigm shift in its approach. In India increasing number of teachers are enrolling for courses on the new teaching learning methodologies so that they don't stay behind in pedagogical advancement happening all over the world. Emphasis on interactive teaching and learning methodologies are gaining ground. Interactive learning has been found to be more effective than formal lecturing, among medical students and medical professional alike. Tutorials usually consist of in depth discussion of a particular topic by a tutor involving a small group of students. Tutorials often assist students to gain a deep understanding of the topic. It enables students to develop their basic academic skills namely gathering relevant resources, communication ability both orally and in writing, time-management and self-evaluation. Faculty make every effort, to improve student's self-directed learning skills but it is many times observed that students don't come prepared for tutorials. Over the years many have tried to modify the traditional tutorials strategy like the debate style tutorial by Shinzaki et al,<sup>(1)</sup> collaborative learning tutorial by Gleson et al,<sup>(2)</sup> student led objective tutorial by Sivagnanam et al,<sup>(3)</sup> peer led supplemental tutorial by Kibble et al<sup>(4)</sup> learner centered tutorial program by Sommannavar et

al,<sup>(5)</sup> interactive intragroup tutorial by Srivastava & Waghmare<sup>(6)</sup> and interactive structured tutorial by Parmar<sup>(7)</sup> to name a few. Tutorials are time tested method of leaning and ever increasing numbers of modifications is a proof of its efficacy. Tutorials also foster a closer relationship between student and tutor as the number of students are fewer. In the present study the tutorial has been modified in such a way that all students are actively involved and are alert. In addition, there is interaction with one another and the teacher. We have also attempted to improve the communication skills by allowing them to speak before an audience and this in turn translates into overall personality development throughout their student career. The objectives of the study were threefold; first, being to introduce a modified interactive tutorial (MIT) among II<sup>nd</sup> phase MBBS Microbiology students, second being to compare this Novel tutorial with the conventional tutorial (CT) and third was to study the perception of students about this Novel tutorial.

### Materials and Method

The study was conducted in the department of Microbiology at Malla Reddy Medical College for Women among the II<sup>nd</sup> phase MMBS students. After obtaining ethical committee clearance and permission from Dean and Head of Department, the study was undertaken. Students were divided into A & B batches.

“A” batch comprised of all odd roll numbers and “B” batch of students having even roll numbers. A sensitization session was organized for the students and faculty from Microbiology department regarding the proposed tutorial.

In session one, 2-3 days prior to tutorial, all students were given an important topic, which was already covered in theory class so that they come prepared for the tutorial. All students were administered a pretest comprising of 20 multiple choice questions (MCQs) before the commencing of the session. “A” batch of students were divided into 10 groups (approximately 7-8 students each) and “B” batch were undivided. In session one “B” batch had conventional tutorial (CT) that is one teacher questioned the students randomly on the topic and helped them comprehend better by clarifying doubts in any. On other hand, “A” batch was divided into 10 groups, the main tutorial topic was divided into 10 subtopics and each group were given one subtopic. They were then asked to present that topic in front of the entire “A” batch after discussing, studying or revising the subtopic for 15 minutes with their group. Any student from a group could be asked to present and also if one group was presenting the other groups were to pay attention as any one of them may be asked to repeat the same randomly. Any point left out by the presenter were presented by other group members. The entire session needed about 2 hours. Following this post-test was taken from both A & B batch (Fig. 1).

The second session was held on a different topic and the student were swapped. That is those who were in conventional tutorial group now underwent MIT. Pretest & Post test was administered on this new topic. After the completion of both sessions the students were administered an anonymous pre-validated questionnaire to elicit their perception on MIT using a five point Likert scale. In addition to three open ended questions about the best and the worst part and other free comments were also included in questionnaire. The pretest and post test scores were analyzed and their perception regarding this technique was also quantified. Statistical analysis was done using SPSS software.

**Evaluation:** Evaluation will be done based on Kirkpatrick’s model of evaluation (Table 1) and statistical analysis by SPSS software. On Pretest and Post test scores- Paired t test was applied table. A questionnaire was used to assess the percentage of positive responses.

## Results

91 students participated in this study. Mean pre-test score of CT 12.46 and posttest was 15.63. Mean pre-test score of Modified Interactive Tutorial was 13.51 and for post-test it was 16.23. The pre and post - test scores of the conventional tutorial, when compared by paired t - test, was found to be statistically significant  $P = 0.00$  ( $P < 0.05$  was considered statistically significant) (Table 2). Similarly, the pre-test and post test scores of MIT was

also found to be statistically significant  $P = 0.00$  (Table 2). The post test scores of CT ( $n = 97$ ) and MIT ( $n = 91$ ) were compared by unpaired t - test, which was found to be significant;  $P = 0.00$  ( $P < 0.05$  was considered significant) (Table 2).

More than 75% of the students were affirmative in the survey about various aspects of MIT. Discussion among students were highly appreciated feature. Those who presented the topics felt good when given an opportunity to speak. Many commented that they realized how important public speaking was. Students also appreciated the fact that all students were actively involved and they were able to gather salient features from all sub topics. Students also enjoyed working in a team which fostered interactive learning. Students who did not come prepared did not attend the modified interactive tutorials. The students also felt more attention is given on each of them in this method than CT. Nearly two-thirds of the students favored MIT as their future tutorial method (Table 3).

In open ended comments it was noted that MIT was useful, interesting, interactive, helped understand topic, equal involvement by all students and team work was cited as the best aspects. Commenting on the worst aspects of MIT, participants felt that it was time consuming.

We also took the feedbacks from the teachers who conducted these tutorials all of them felt that MIT was interesting and students were actively involved in comparison the CT.

## Discussion

Students in II<sup>nd</sup> phase are found reading Pharmacology and Pathology as they find those subjects difficult and voluminous. Microbiology is usually considered easy but once they start reading and understanding the subject; the students are all confused about the various bacteria, virus, fungi and parasites. They are very nervous after appearing for the first formative assessment as they realize the need to give equal importance to all subjects and also to study every day. Conventional tutorial are excellent in some aspects but the problem of inadequate number of teaching staffs in many colleges makes it difficult to conduct. In order to circumvent the deficiency of teaching staff we thought of modifying the conventional tutorial in a way so as to retain the interest of the student by making it more interactive. The reason we opted for a verbal form of answering was to keep all students alert.

An overwhelming majority of teachers and staff were happy with the modified format of tutorial and wanted it to be used as future method. We applied MIT techniques for many of our tutorial following the response we received.

The study has some shortcomings like we were able to conduct only two sessions for the students where we administered pre and posttest. Few students absented themselves from these tutorials. We require two hours to

conduct this format of tutorial. We would try to resolve this time constraint by allotting smaller portions for

tutorial. Prior planning is also very necessary and vital for success of this tutorial.

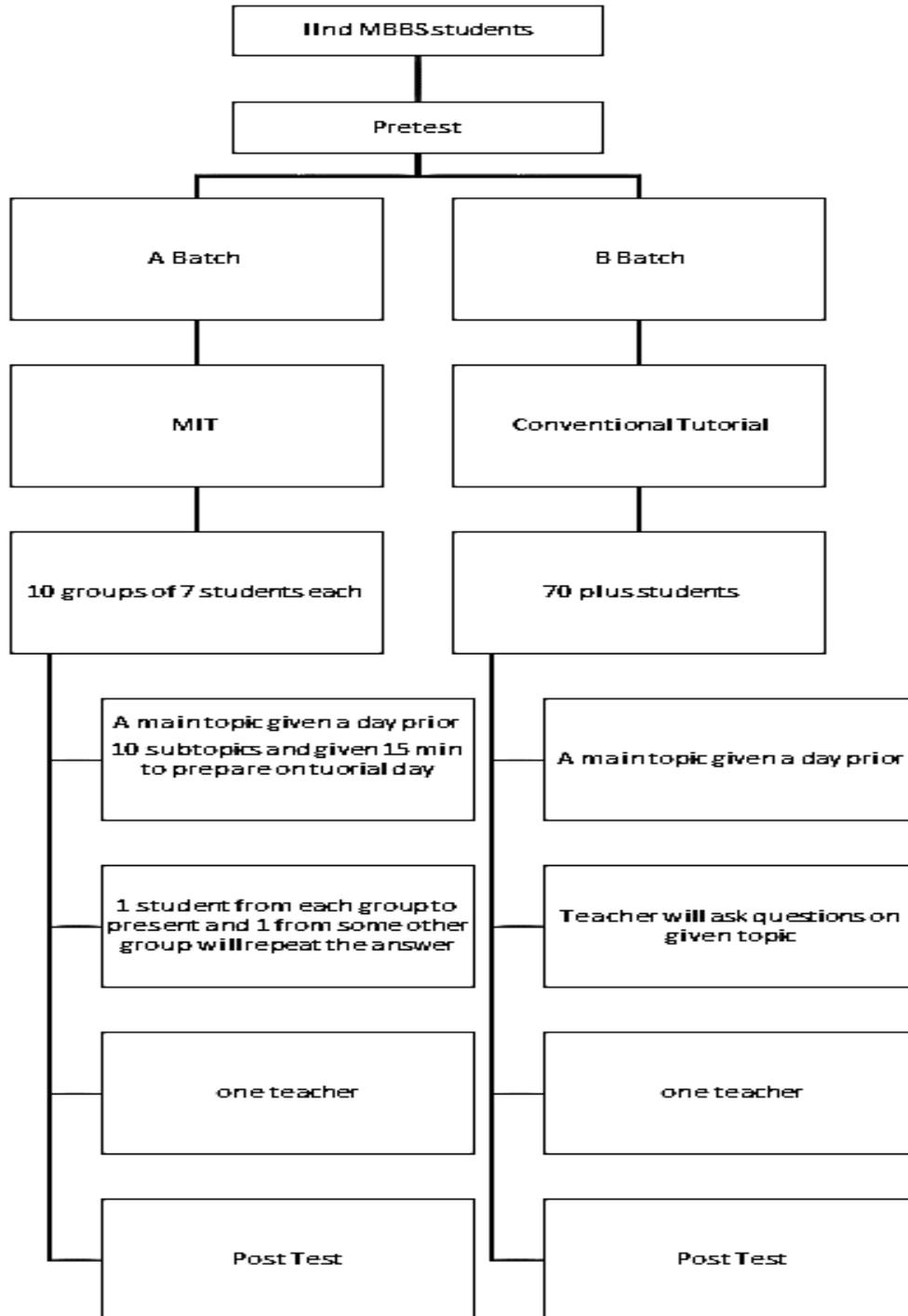


Fig. 1: Flowchart of Methodology of Modified Interactive tutorial

**Table 1: Kirkpatrick Model of Evaluation**

Levels of Evaluation	Evaluation Question	Indicators change	Data source Whom/ where	Data collection How/method
I- Reaction	How do you feel about this modified tutorial? Do you feel it was useful?	No of positive /negative remarks satisfaction	Students	Questionnaire
II- Learning	Whether the student was able to gain better knowledge from this tutorial	Scores of Pre test & Post test	Students	Assessment by MCQ,

**Table 2: T test**

Pairs	Paired Differences		t	Significance
	Mean	Std. Deviation		
Pretest MIT- Post MIT	2.71429	2.42343	10.684	.000
Pretest CT- Post CT	3.17582	2.96496	10.218	.000
Posttest MIT- Posttest CT	.59341	2.85960	1.980	0.05

**Table 3: Perception of students about Modified interactive tutorial**

Statement	Agree + Strongly Agree
The new type of tutorial was relevant to the topic	97%
The new type of tutorial stimulated interest in the topic	82%
The new type of tutorial assisted me in understanding of the content of the lectures	77%
The new type of tutorial provided guidance on how to learn effectively for this topic	73%
I learnt more than I would have by participating in a traditional (old type) tutorial	69%
I received adequate feed back	74%
I enjoyed interacting with a team	86%
The group work increased my ability to learn independently	68%
Learning process was pleasurable with this new tutorial	78%
The supervision by the lecturer was useful	87%
I look forward to have more of this kind of new type tutorial	74%
I feel more attention is given to students in this new tutorial	82%
All students are equally involved and encouraged to participate	90%
It helped me become aware of my communication skills	87%

## Conclusions

MIT is a novel tutorial method which, in our opinion, has advantages like enhanced interest among teachers and learners, equal attention and involvement of all students, better understanding of subject, overcoming deficiencies in staff strength, opportunities for group learning and active learning. In our experience we have seen that students usually don't come prepared for any tutorial and attend class where they neither contribute nor learn as they sit passively. We attempted to change this scenario by making them more alert and attentive during tutorial by engaging them and also engaging them among themselves.

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