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## Study Of Effectiveness Of Incomplete Handouts During Anatomy Theory Lectures For 1<sup>st</sup> Year MBBS Students.

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### ABSTRACT

Incomplete handouts provided to the students during lectures play a significant part in organizational learning, helping students to prepare for what is ahead. The present study has been done to compare the pretest and post test scores of students for lectures with handouts and those without handouts. The study was conducted on 140 1<sup>st</sup> year MBBS students at the Department of Anatomy, MVJ Medical College & Research Hospital. Four topics from the Curriculum of Anatomy were Chosen. Topics 1 & 3 were taught by lectures without handouts; topics 2 & 4 by lectures with handouts. Pretest and post test was done for all the topics using multiple choice questions. Pretest and posttest scores were analysed and compared for lectures with and without handouts. Posttest scores were significantly higher when compared to the pretest scores for all the topics. Pretest scores for lectures with handouts were slightly higher when compared to those without handouts. Posttest scores for lectures with handouts were significantly higher when compared to those without handouts. Lectures with incomplete handouts are more effective when compared to those without handouts as it improves the performance and promotes self directed learning among students.

**Keywords:** Anatomy, Incomplete Handouts, knowledge gain, Lectures, Pretest, posttest.

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## INTRODUCTION

The most common and preferred method of audiovisual aid by the students for teaching is PowerPoint presentation compared to the traditional chalk and board & OHP projector. One of the disadvantages of PowerPoint presentation is boredom & fatigue along with lack of stimulation leading to loss of attention span of students. This can be overcome by providing students with incomplete handouts during lectures [1].

Handouts are written material which are helpful to the teacher as well as the students. Handouts help the students to think more about the concepts. It makes lectures interesting for the students and they recall the information better.

Providing handouts to the students makes the lectures not only portable and enduring but also helps the students to stay alert and active. It also increases the understanding of the subject and improved test performance. Students stay focused and points can be added by them in incomplete handouts. They also form a framework on which the students can learn [2].

### Aims and Objectives

- To compare the pretest and post test scores of students for lectures with handouts and those without handouts.
- To analyze the effectiveness of this combined method (lectures with handouts) on the knowledge gain of students in Anatomy.

## MATERIAL AND METHODS

The present study was done on 140 first year MBBS students in the Department of Anatomy, MVJ Medical College & Research Hospital, Bangalore. The type of study was interventional quantitative study, done in the same group of students using pretest and post-tests. The Institutional Ethical Committee clearance was obtained prior to the study. Four Core competency topics from Anatomy curriculum were chosen which had nearly the same difficulty level. Each lecture was of one hour duration and was done at the beginning of first year. Topic 1 (Histology of lung and trachea) was chosen and taught using routine didactic lecture (without handouts); pretest was done in the form of multiple choice questions for the whole class before the lecture and post test was done with the same questions immediately after the lecture.

Topic 2 (Development of Respiratory system) was done with incomplete handouts given 3 days prior to the lecture. Pretest and posttest was done for Topic 2 with handouts. Both topics (1 & 2) were delivered by one professor. Topic 3 (Interior of the heart) was done using routine lectures without handout and Topic 4 (Pleura) was done with handouts given 3 days prior to the lecture. Topics 3 & 4 were dealt by another professor. The handouts provided to the students comprised of either diagrams only/ title with only key points. Pretest and post test was done for topics 3 & 4. The MCQ test conducted were case based & comprised of ten single response Multiple choice questions. The questions were compiled in a way that they tested not only higher order of cognitive domain but also required multilogical thinking.

### Statistical analysis

Data was processed using Microsoft excel and analysed by using SPSS software version 16 (SPSS Inc., Chicago, Ill., USA). Descriptive statistics such as Mean and Standard deviation were described. The mean and standard deviation between the pre test and post test scores was analysed by using paired t test. P value <0.05 was considered as statistically significant.

## RESULTS

The Pretest and posttest scores for Topics 1 & 3 (without handouts) and Topics 2 & 4 (with handouts) were compared and summarized in Table 1. Posttest scores were significantly higher when compared to the pretest scores for all the topics. Pretest scores for lectures with handouts were slightly higher when compared to pretest scores for lectures without handouts. P value <0.0001 was considered as significant.

**Table 1: Comparison of pretest and posttest scores without handouts and with handouts**

Lecture		Pretest	Post test	Mean Differences	t value	P value
		Mean±SD	Mean±SD	Mean±SD		
1.Histology of lung & trachea	Without handouts	2.73±1.39	5.35±1.71	2.61±1.74	-17.98	<0.0001
2.Dev of RS	With handouts	2.87±1.42	7.52±1.43	4.65±1.84	-30.23	<0.0001
3. Interior of heart	Without handouts	2.01±1.33	6.14±1.67	4.14±1.93	-25.52	<0.0001
4. Pleura	With handouts	2.58±1.74	9.13±1.17	6.55±2.13	-36.66	<0.0001

The comparison of posttest scores (with handouts and without handouts) with mean differences between the two scores is summarized in Table 2. Posttest scores with handouts (7.52 ±1.43, 9.13 ±1.17) were significantly higher when compared to posttest scores without handouts (5.35±1.71, 6.14±1.67) with a P value of less than 0.0001.

**Table 2: Comparison of posttest scores without handouts and with handouts**

Test		Lectures Without handouts	Lectures With handouts	Mean Differences	t value	P value
		Mean ±SD	Mean ±SD	Mean±SD		
1	Post Test	5.35±1.71	7.52±1.43	2.18±2.20	-11.84	<0.0001
2	Post test	6.14±1.67	9.13±1.17	2.98±2.01	-17.67	

**DISCUSSION**

Prabhu V [1] in his study compared the effectiveness of full handouts with incomplete or skeleton handouts and revealed that students preferred complete/full handouts but performance in examination improved with skeleton handouts when compared to full handouts. Full handouts helped the students for easy referral during examination but had the disadvantage of reduced attendance of students. Incomplete handouts keep the students actively engaged and attentive & improve their overall attendance.

Bhaisare [2] conducted a study on final year MBBS students to evaluate the impact of utilisation of uncompleted handouts given prior to PPT presentations. Mean scores for lectures with handouts were higher when compared those without handouts. Repeater students were more benefited than fresher students. It also helped to increase the attendance of the class. The knowledge gained by the students was higher when uncompleted handouts were given to them prior to the lectures. This method was also very much useful in developing countries where there are limited faculty in medical colleges and the teachers need to handle multiple tasks apart from teaching.

A study was done by Babu RS [3] to analyze whether the structured handouts enhance the learning outcomes of medical students using three methods, pre handout, post handout, no handout together with traditional lecture class. There was no significant difference in student's performance among the three groups but providing handouts during lectures was seen to generate interest and enhanced their understanding and scoring. Providing material in advance prior to class helps students to understand the lecture information more readily.

Shashikala GV [4] performed a study to determine the effectiveness of instructor prepared outlined handouts, as an instructional tool for practical sessions and also to obtain the perception of the students on the handouts as learning material. The study showed an increase in the average post-test scores of study group in comparison to average post-test scores of control group. Most of the students preferred handout as they motivated them to attend the practical sessions, aroused interest in learning the skills, follow the instructions by demonstrator, practice skills individually after the lab session.



The present study showed that there was a statistically significant difference between the mean post test scores of lectures with and without incomplete handouts. Students performed better when traditional lectures are combined with incomplete handouts which are in agreement with studies done by Bhaisare and Shashikala [2, 4].

However the present study could have included the perception of students regarding incomplete handouts and effectiveness of different types of handouts on the student's performance.

There are different types of handouts. One type is full lecture notes which include copies of all the graphs and diagrams. It is a complete handout which includes all the slides of the PowerPoint presentation. It can be prepared easily, requires very little student input or effort but if students are given this type of handouts, many may not attend the lectures. The second type of handout is Summarized notes on the main points for the discussion which provides bullet points about the main topics of the class. Only a few main points are emphasised in the class and there is no detailed discussion of the topics. The third type is Student copies of the slides and diagrams used in class. The content of the slides provided to the students should be minimal. This type of handouts is useful for the students as the lecture framework is already provided to them. It also allows them to write notes about the diagram. The fourth type includes a list of the main lecture points. This form provides the student a general guideline that allows the student to follow along with the classroom discussion but without diagrams or graphs. Additionally, the student is fully responsible for the content of the notes. This form maximizes student effort while also providing a general framework.

The fifth type is a copy of the class agenda which is the least complete form of a handout. Complete responsibility for notes is placed upon the shoulders of the student. The only purpose of this form of a handout is to provide a guide for class discussion so the student will more easily determine the main points of the classroom discussion and how the learning points relate to each other.

Incomplete handouts save lot of time for students as they can listen to lectures without the need of writing continuously. Using a mix of lecture handouts (complete and incomplete) helped to meet the expectations of heterogeneous students and could be followed routinely in the classroom [5].

Handouts act as a guide for learning and revision before the examination. They can also be used as a reference by the students. The learning objectives provided in the handouts can be used as a guide for future learning. Students expect that the handouts provided to them should be clear, brief, in a simple language, well structured & organised in a logical order, has compilation of summary from standard textbooks, extraneous information omitted, graphics chosen should clearly illustrate the topic, font easily readable, all abbreviations clearly defined, proof reading done for clarity, organization, accuracy, spelling and grammar, all texts and figures that students need to be included, all images are labeled, clinical concepts are outlined, contain key references, review questions and definitions of new terms. Plenty of space can be provided especially in incomplete handouts so that students can take notes. The outcome of the lecture should be included in the handouts. Providing Handouts during lectures makes teaching more practical, improves concentration, and helps to guide students during classes along with giving abundant information. They provide a general overview on the subject & create a more effective learning environment. But they can only supplement rather than substitute students' regular reading [6-8].

Handouts should be prepared in a way of what is going to be expected from the students. The form of handouts also should be decided. Handouts increase the amount of instruction for the student as more material can be covered in a faster time. Students can gather, process, retain information more quickly and easily than before as they listen & contribute to the discussion during lecture [8].

These handouts helped the student to repeatedly look over the subject at their leisure and enhanced the understanding of the material by the systematic, ordered and organized presentation of the topic. They promote students comprehension and build the students' curiosity to know the gaps in the handouts. They also help them in the process of reviewing and better retention.

## CONCLUSION

The results of the present study showed that lectures with incomplete handouts are more effective when compared to lectures alone as the knowledge gained by the students is better when



incomplete handouts are given to them prior to lectures. It also promotes self directed learning among students which forms an essential component of competency based medical education curriculum. Hence faculty should be encouraged to supplement their lectures with incomplete handouts as they reinforce active learning and engagement among students.

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