

Traditional demonstration versus modified demonstration in the department of anatomy

Surwase Ramdas Gopalrao^{1*}, Ferozkhan J Pathan², Smita Balsurkar³, Mahesh Ugale⁴, Prity Solanke⁵

^{1,2,4,5}Associate Professor, ³Assistant Professor, Department of Anatomy, MIMSR Medical College, Latur, Maharashtra, INDIA.

Email: r.surwase@yahoo.in, drferoz07@rediffmail.com, drsmitasantosh@gmail.com, dmsu1974@yahoo.com, solankepriti@rediffmail.com

Abstract

Aim and Objectives: 1) To compare learning gain between traditional demonstration and modified demonstration. 2) To implement better method throughout the year. 3) Application of knowledge of anatomy for the better patient care. **Methodology:** Ist MBBS (100) students 2014-15 batch pretest on bones of upper extremity was taken and evaluated. Students are divided into two groups Group-A and Group-B 50 students each. For the one Group-A demonstration is done by routine demonstrations and for the Group -B teaching was started with modified method that is with bones and showing the video clips of respective bones. After the completion of demonstration of bones of upper extremity posttest was taken and evaluated. Statistical analysis was done with the help of excel program. **Results:** For the bones of upper extremity demonstration, mean score of the Group- B is more as compared to Group A. The calculated Z-value is three times greater than standard error value. Hence the observed difference in mean score of two groups is real in 99% students and is due to the intervention given to the students. **Conclusions:** The learning gain for the group-B is more than Group-A. More learning gain for this group is because of intervention that is video clip. **Keywords:** Learning gain, traditional demonstration, modified demonstration, lecture cum demonstration (LCD).

*Address for Correspondence:

Dr. Surwase Ramdas Gopalrao, Associate Professor, Department of Anatomy, MIMSR Medical College, Latur, Maharashtra, INDIA.

Email: r.surwase@yahoo.in

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INTRODUCTION

Teaching and learning are active processes occurring simultaneously on a continuous basis.¹ In this traditional method, the teacher can easily engage the learners actively because students think on each written or discussed point on the board. However, there are few limitations of this tool. The teacher may avoid writing or drawing a figure or flow chart on the board. In medical teaching support of illustrations is very important to develop a concept of that organ/structure/ system. Therefore, the students may face difficult to understand the ideas/concept of the content on the chalkboard.

Considering all these facts both the tools of teaching have some strength and weaknesses. However, learning is the cognitive processes whereby an individual acquires the professional and ethical values, the bio-medical, behavioral and clinical knowledge, reasoning and psychomotor skills necessary for professional competence.² Furthermore, learning is relatively permanent change in the behavior of the learner.^{3,4} This can be demonstrated when learners acquire the ability to express their gained insight, realization, facts and new skills.⁵ Both teaching and learning are dependent on myriad contextual factors, including the teacher, the learner, the subject matter, environment (s) and the teaching methods. The responsibility lies on the teacher to ensure that student is given the opportunity to think in the classroom.⁶ It has to be acknowledged that attention should be given to the teaching of thinking skills, such as reasoning, creative thinking, and problem solving; as thinking is essential to knowledge and knowledge is essential to thinking.⁷ Additionally, teachers should ensure that students are given the opportunity to develop their metacognitive abilities. The applications of computer technology enhances the ability to process the ever-increasing volume of medical knowledge.⁸ Over the

past decade the utilization of software applications (e.g. PowerPoint) in medical schools have dramatically increased. Over the years we have observed that there is a very low passing rate for the Anatomy and for that reason we decided to implement the use of student-learning resources. The objective of this study was to compare the results of traditional methodology with those obtained with the support of computer-assisted learning. Since so many years teaching anatomy to the medical students has not been changed. Only change now a days is blackboard has been replaced by the LCD projector. On LCD projector teachers they are bringing the PowerPoint and they are teaching to the students. At so many places LCD projectors are also not used properly. Usually bones are taught to the students in the small groups. MCI has also recommending the teaching of the bones in this way on this way only. In every college who is having the strength of 100 students, they are making the four batches (equal distribution of students) and bones are thought to the students. This small group teaching of the bones in four batches is known as lecture cum demonstrations (LCD CLASSES). Usually LCD classes are counted in practical hours as per Medical council of India norms as well as Maharashtra University of health sciences Nasik. Maharashtra University of health sciences Nasik also recommending the same procedure for teaching the bones to the Ist MBBS students. Since so many years this type of teaching was going on and has not been changed. No one has evaluated also the learning gain in the students and also not taken the feedback from the students. Because of lack of availability of faculty members, instead of making four batches bones are taught to students in one or two batches. Where there are postgraduate students, they are least interested in teaching the bones to students because of workload. Many teachers teach with very little concern about their own teaching skills. Thus they miss the opportunity to identify the lacunae in their teaching. The teacher's role is not just to deliver information but also to scaffold and to respond to students' learning efforts. Similarly, the students' role is not just to copy new information, but also to actively make sense and construct meaning.⁹ The multiple resources provided by the Internet offer a new and exciting environment that can improve patient care, education, and research.¹⁰

AIM AND OBJECTIVES

Short term: To compare learning gain between traditional demonstration and modified demonstration.

Intermediate: To implement better method throughout the year.

Long term: Application of knowledge of anatomy for the better patient care.

REVIEW OF LITERATURE

Literature on this topic is rare. But use of multimedia resources was commonly used. Different teaching techniques have been introduced, such as "brainstorming" (Geuna and Giacobini-Robecchi, 2002)¹¹, animated presentations in Power Point (Carmichael and Pawlina, 2000)¹², and educational videos (Galva'n *et al.*, 1999)¹³. These new methods have yielded good results. In addition, three-dimensional software and multimedia computer programs for anatomy (Schwartz, 1980)¹⁴ have been developed for the same purpose (Trelease, 2002; Van Sint Jan *et al.*, 2003)^{15, 16}. Previous studies also obtained good results with the use of CAL (computer-assisted learning) in anatomy courses. For example, Carmichael and Pawlina (2000) noted that interactive resources, such as animated Power Point presentations, are excellent tools for teaching anatomy.¹² Geuna and Giacobini-Robecchi (2002) concluded that brainstorming in anatomy courses can be a very efficient means of stimulating learning.¹¹ According to Galva'n *et al.* (1999), the use of educational videos increases retention and long-term learning.¹³ Over the years, methods of teaching anatomy have gone through three stages, from simple observation to dissection of cadavers, and now to computer-assisted learning (CAL) (Trelease, 2002).¹³ On the other hand, in a study in which each learning method was isolated, Bukowski (2002) found no statistically significant difference between groups of students who attended a theory class with cadaver dissection (completed traditional cadaver human gross anatomy course) and those who took a computerized self-directed course with no cadaver. Therefore, Bukowski (2002) suggested that technological resources do not provide a clear advantage. This is in contrast to the current study, in which CAL was used in combination with the traditional method.¹⁷ According to Brown and Manogue, Brill and Galloway Lectures can be supplemented with audiovisual aids for better illustrations, clarity and learning.^{18, 19}

MATERIAL AND METHODS

Ethics committee approval

The study was carried out after the approval of institutional ethics committee. Also took the consent from the students before starting the actual procedure.

Study Site

Study was conducted in the department of anatomy with prior permission Head of the Department.

Materials

Pretest and posttest were prepared and approved from the other faculty members in the Dept. of Anatomy. Approved pre and posttest were then used.

Audiovisual system which is mounted in the Anatomy lecture hall was used to show the video clips made by Dr.

Robert D. Acland which contains detailed description bones of upper extremity.

Study Design

Prospective study in the department of Anatomy.

Study Sample

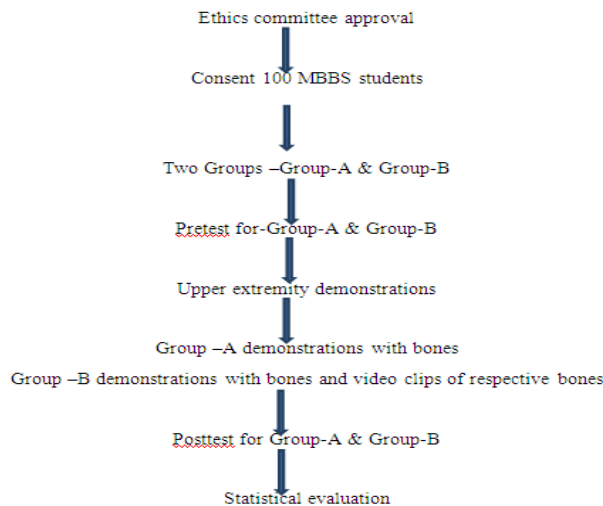
All the 100 students who got the admission for the Ist M.B.B.S. for the year 2014-15 were included. Pretest and posttest were taken. Pretest was taken before starting the upper extremity then posttest was taken. Pretest and posttest then evaluated. No one is excluded from the study. Both males and females students were included. Age groups were between 17 to 20 years. Identity of the students is not revealed.

Sample size

Pretest and posttest for the upper extremity were taken from 100 students and evaluated. After that video clip was shown to all students and the bones of upper and lower extremity and again posttest was taken from all 100 students and evaluated.

Source of video clips

Video made by Medsoft India Pvt LTD, Mumbai by Dr. Robert D.Acland, Dept. of Plastic Surgery, University of Louisville, USA on bones of upper and lower extremity were used to show.



OBSERVATION AND RESULTS

The most important factor in learning is the baseline knowledge of students and new knowledge is constructed by building or enhancing concepts on existing knowledge. The activation of existing knowledge is an obvious starting point in any workable model for teaching. 100 students were there in the Ist MBBS 2014-15 batch. Two batches were made for the purpose of demonstration of bones of upper extremity named as Group-A, Group-B 50 students each. Out of 100 students 44 were males and 56 were females **Figure-1**.

Preservation of pretest and posttest from

Pretest and posttest were taken for upper extremity and lower extremity and preserved.

PROCEDURE

Before admission of Ist MBBS 2014-15 batch pretest and posttest on upper and lower extremity was made and that was approved from the other faculty members from the Dept. of Anatomy. Also video clips by Dr Robert D. Acland on the bones of upper and lower extremity were made available in the Department and was checked that it is working properly on the audiovisual system mounted in the anatomy lecture hall. After admission of Ist MBBS (100) students 2014-15 batch pretest on bones of upper extremity was taken and evaluated. Students are divided into two groups Group-A and Group-B 50 students each. For the one Group-A demonstration is done by routine demonstrations and for the Group -B teaching was started with modified method that is with bones and showing the video clips of respective bones. After the completion of demonstration of bones of upper extremity posttest was taken and evaluated. Statistical analysis was done with the help of excel program.

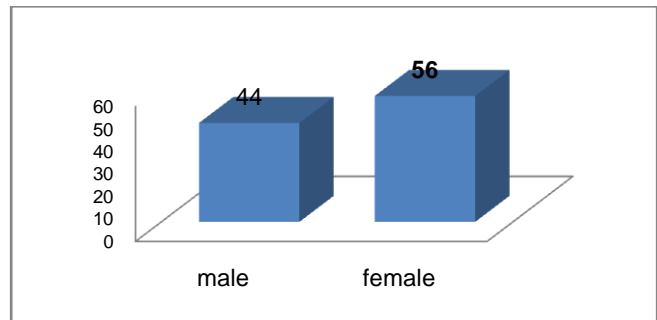


Figure 1: Gender

Out of 100 students two students belong to 17 years, 43 students belong to 18 years, 50 students belong to 19 years, and 5 students belong to 20 years (**Figure-2**).

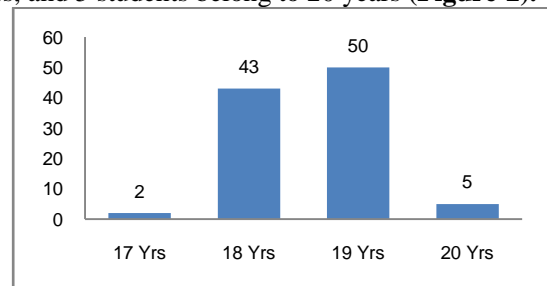


Figure 2: Age

UPPER LIMB DEMONSTRATION

Figure: 3 showing marks obtained during the demonstration of upper extremity in the posttest with red

colour figure is for the group B students who were taught the demonstrations with the help of bones and video clips of respective bones. Blue colour figure is for the group A

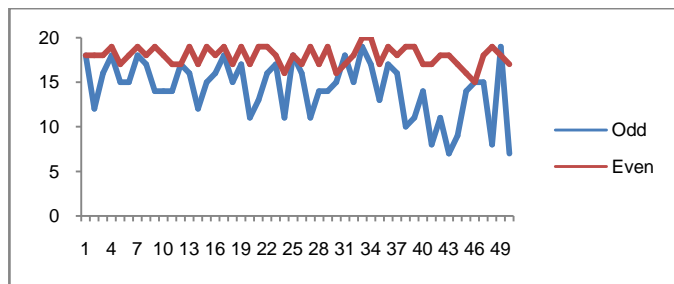


Figure 3: Marks obtained

Table 1: Showing mean score and standard deviation for the Upper limb

	Group A	Group B
Mean score	14.32	17.92
Standard deviation	3.17	1.08

Table 1 showing mean score of Group B is 17.92 with S.D. of 1.08 which more than mean score of Group A which is 14.32 with S.D. of 3.17. The test applied is standard error of difference between two means. Calculated value of S.E. comes to be 0.48. Calculated Z value for this experiment comes to be 7.60 which is three times greater than S.E. value. Hence the observed difference in mean score of two groups is real in 99% students and due to the intervention given to the students.

Table 2: Showing standard error and Z-value for the upper extremity

	Standard error	Z- value
Upper Extremity	0.48	7.60

Lastly feedback from the students was taken. 99% of the students like the modified method and the reasons behind that a) Teacher can show each and every part of the bone to all students, b) All the points can be covered in very less time interval, c) Systematic way of presentation, d) No need to carry the bones by students.

DISCUSSION

Teaching with integrated tools facilitate the students and involve in refinement as the teacher reviews what has been covered and emphasize the key points made. One of the most useful activities for the student is to make a summary in his/her own words of the main thrust of the session and to annotate this in relation to previous learning and possible future applications. Changing the macroscopic anatomy curriculum is a challenging task, and it is necessary to evaluate educational methods to determine which are the most effective and efficient. There is no doubt that learning is better when the learner

who were taught the demonstration with the help of bones only (Figure-3).

is active rather than passive. Appropriate learning should be meaningful, achieved on a wide range of stimuli, frequent practice in varied contexts and group discussion is also necessary for effective learning. Moreover, learning is more likely to be effective and efficient if learners are informed as to how well they are doing. It is also the responsibility of the teacher to facilitate learning, encourage thinking and try to relate what is already known. It would be more productive if the teacher emphasizes the significance of the knowledge gained in future / practical life, so that student become eager to know and learn. The student must be given an opportunity to apply acquired knowledge in various activities such as analysis, synthesis, evaluation and problem-solving. There should also be interaction between students and exchange of views need to be fostered by the teacher so that conflicting views can be considered, discussed and resolved. While taking the demonstration of upper extremity students were divided into two groups. For the one group bones were taught with the help of bones and video clips of respective bones was shown to them. For the other group demonstrations were taught with help of bones only. Mean score of the group who were taught with the help of bones and video clips of respective bones was more as compared to the mean score of the other groups.

SUMMARY

After the admission of Ist year MBBS students 2014-15 batch (100 students), 100 students were divided into two groups Group-A and Group-B. Before starting the demonstration (LCD-lecture cum demonstration) of bones upper extremity pretest was taken. For the Group-A demonstration were taken only with the help of bones whereas for the Group-B demonstration were taken with the help of bones and in addition to the bones video clip of respective bones was shown to them. Posttest was taken for both the Groups-A and B. Mean score and standard deviation was calculated with the help of excel program. Mean score of group-B was more (17.92 with S.D. =3.17) as compared to the Group-A (14.32 with S.D=1.08.).Standard error of difference between two means was calculated, and then Z value was calculated. After the statistical analysis it was found that the calculated Z value is three times greater than standard error value. Hence the observed difference in mean score of two groups is real in 99% students and is due to the intervention given to the students for the Group-B. The intervention for the Group-B was showing the video clips of respective bones.

CONCLUSION

For the bones of upper extremity demonstration, mean score of the Group- B is more as compared to Group A. The calculated Z-value is three times greater than standard error value. Hence the observed difference in mean score of two groups is real in 99% students and is due to the intervention given to the students. That means learning gain for the group-B is more. More learning gain for this group is because of intervention that is video clip.

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