

USE OF ANIMATION IN TEACHING PHYSIOLOGY: AN INSTITUTIONAL BASED STUDY

Komal Ajay Meshram¹, Ajay Wasudeo Meshram², Alka Rawekar³

¹Assistant Professor. ³Professor & Head, Department of Physiology, Jawaharlal Nehru Medical College, Wardha, Maharashtra

²Professor & Head, Department of Biochemistry, Jawaharlal Nehru Medical College, Wardha, Maharashtra

ABSTRACT

Objectives: To evaluate the gain in knowledge of first year MBBS students with the use of animation. **Methodology:** Prospective Interventional study was conducted in department of physiology. 200 first year MBBS students participated in the study. 100 students (Group-A) were taken as control group to them the topic of physiology was taught by didactic method and another 100 students (Group-B) were taken as intervention group, where the same topic was taught with Power point presentation along with animation. For each lecture pre and posttest was taken. Five consecutive lectures were planned with this intervention. At the same time feedback forms were given to intervention group for purpose of analyzing the results qualitatively. After this intervention the crossover of groups were done only for the sake of getting benefit of intervention. **Results:** Data obtained was analyzed statistically. Pre and posttest mean were taken. The results of posttest ($p < 0.05$) were found to be significant when compared with pretest. As per the results of feedback forms, 90% ($n=100$) students agreed that the animation is powerful tool to understand the topic as it improves knowledge and makes learning interesting. **Conclusion:** According to the MCQ and feedback analysis, the results showed that teaching with power point presentation along with animation is the better method for making the students to learn, understand and to gain the knowledge of physiology lectures rather than by power point presentation alone.

KEYWORDS: Animation, Chalk and board, Overhead projector, Teaching aids, Visual impact.

INTRODUCTION

Teaching and learning are important events for an individual during his life. Teaching and learning are the phenomenon for carrying knowledge from one generation to another generation and the process goes on and should go on for the betterment of society and mankind. Teaching is effective when learner understands and tries to implement what is being taught. To make teaching effective, valuable, and measurable and its application various teaching aids are in use [1, 2]. Chalk and board was the first tool in modern teaching modalities. Then teachers started using overhead projector slides (OHP). Now a day's teachers are using Power point presentations (PPT) for delivering lectures [3]. Power point presentation is the preferred method of visual aid in lecture hall. Power point presentations

have definite advantages over the traditional chalk board, and overhead projectors [4]. It is observed and noticed that the attention span of students is decreasing gradually; power point presentations are becoming boring to the students. Hence the resultant output of gain of knowledge is decreasing. To overcome this many educationalist had proposed different modules after their experiences and research projects.

The choice of the teaching aid depends upon an individual thinking. Abstract scientific phenomena occurring in the macroscopic level or in the microscopic level can be attractively illustrated by animated movies. Animations are employed for enhancing the transitions from abstract to concrete mental operations and vice versa [5].

Learning is a process involves improving knowledge, skill and attitude respectively with cognitive domain, psychomotor domain and affective domain of the student [6]. The visual impact is better than the descriptive lectures as we know and experienced that movies are remembered for longer time. With this idea, the present study was conducted in the department of physiology JNMC Wardha to know the effectiveness of



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Correspondence: Komal Ajay Meshram, Assistant Professor, Department of Physiology, Jawaharlal Nehru Medical College, Wardha, Maharashtra, India. E-mail: meshram.komal3@gmail.com

animation as a teaching tool in understanding physiology topic.

Aim: The present study was designed to know the use of animation in teaching didactic lectures can improve the process of learning of topics in physiology for MBBS First Year students of Jawaharlal Nehru Medical College Sawangi.

Objectives:

1. To observe the improvement in the process of learning in physiology.
2. To evaluate the gain in knowledge of first year MBBS students with the use of animation.

MATERIALS & METHODS

Study design: Prospective interventional study

Ethics approval: Institutional ethical committee of Jawaharlal Nehru Medical College Sawangi Meghe Wardha Maharashtra INDIA after screening the synopsis submitted has approved the said project to carry out in the institution.

Study setting: The present Study was conducted in Department of Physiology, J.N. M. C, Sawangi (Meghe), Wardha, a rural part of Vidarbha region of central India.

Study duration: Six month

Study group- Ist year MBBS students for academic year 2016-2017, at JNMC, Sawangi (M), Wardha.

Sample size- 200 students.

Inclusion criteria: First year MBBS student ready to participate in the study were included considering the IQ level of the entire student is same or near to similar.

Exclusion criteria: Previous experience of animation teaching. 2. Not willing to give consent.

Grouping: Participants were divided into two groups in each group n=100

Methodology: Present study consisted of 200, IInd semester, first year MBBS students. The protocol for the intervention to be followed for the study was explained to them.

Intervention: In the Group-A, 100 students were taken as control group who were taught lectures by routine didactic method while 100 students of Group-B were taken as intervention group were taught lectures by power point presentation along with animation. For each lecture pre and posttest was undertaken. Five consecutive lectures were planned with this intervention. After this intervention the crossover of groups was done. At the same time feedback forms were given to intervention group for purpose of analyzing the results qualitatively.

Statistical analysis: Data obtained was analyzed statis-

tically. Students paired't' was used to compare the results in same group while Students unpaired't' test was used to compare the results between two groups. The observations and results for the present study are as follows and are depicted using SPSS 16 software.

RESULTS

As in Table 1 it can be seen that in all the 5 lectures which were taken for control group the mean scores of marks have been increased. The increase is statistically significant in all the 5 lectures. P value for all the 5 lectures is <0.001.

Table 1. Comparison of marks of lecture 1 to lecture 5 in control group at pre and post test

| | | Mean±SD | t-value | p-value |
|-----------|-----------|-----------|---------|---------|
| Lecture 1 | Pre Test | 2.05±1.31 | 22.47 | < 0.001 |
| | Post Test | 5.65±0.84 | | |
| Lecture 2 | Pre Test | 1.96±1.32 | 24.83 | < 0.001 |
| | Post Test | 5.68±0.82 | | |
| Lecture 3 | Pre Test | 2.25±1.42 | 23.80 | < 0.001 |
| | Post Test | 5.90±1.04 | | |
| Lecture 4 | Pre Test | 2.36±1.41 | 23.69 | < 0.001 |
| | Post Test | 5.97±1.07 | | |
| Lecture 5 | Pre Test | 2.47±1.41 | 22.59 | < 0.001 |
| | Post Test | 5.92±1.04 | | |

As in Table 2 it can be seen that in all the 5 lectures which were taken for intervention group mean scores of marks have been increased. The increase is statistically highly significant in all the 5 lectures. P value for all the 5 lectures is <0.001.

Table 2: Comparison of marks of lecture 1 to lecture 5 in intervention group at pre and post test

| | | Mean±SD | t-value | p-value |
|-----------|-----------|-----------|---------|---------|
| Lecture 1 | Pre Test | 1.86±1.34 | 32.91 | <0.001 |
| | Post Test | 6.10±1.33 | | |
| Lecture 2 | Pre Test | 1.86±1.34 | 26.80 | <0.001 |
| | Post Test | 6.62±1.38 | | |
| Lecture 3 | Pre Test | 2.16±1.45 | 24.35 | <0.001 |
| | Post Test | 6.83±1.34 | | |
| Lecture 4 | Pre Test | 2.36±1.38 | 24.55 | <0.001 |
| | Post Test | 7.04±1.29 | | |
| Lecture 5 | Pre Test | 2.51±1.51 | 22.94 | <0.001 |
| | Post Test | 7.09±1.22 | | |

Table 3 depicts the comparison of marks for pretest carried out for control and intervention group. It shows that the mean scores obtained for all 5 lectures are more or less same. The p value calculation also is not

significant for all 5 lectures.

Table 3. Comparison of marks of lecture 1 to lecture 5 in both the group at pre tests.

Table 4 depicts the comparison of marks for posttest

| | Group | Mean±SD | t-value | p-value |
|-----------|--------------|-----------|---------|----------|
| Lecture 1 | Control | 2.05±1.31 | 1.00 | 0.314,NS |
| | Intervention | 1.86±1.34 | | |
| Lecture 2 | Control | 1.96±1.32 | 0.52 | 0.59,NS |
| | Intervention | 1.86±1.34 | | |
| Lecture 3 | Control | 2.25±1.42 | 0.44 | 0.65,NS |
| | Intervention | 2.16±1.45 | | |
| Lecture 4 | Control | 2.36±1.41 | 0.00 | 1.00,NS |
| | Intervention | 2.36±1.38 | | |
| Lecture 5 | Control | 2.47±1.41 | 0.19 | 0.84,NS |
| | Intervention | 2.51±1.51 | | |

carried out for control and intervention group. It shows that the mean scores obtained for all 5 lectures are increased in intervention group as compared to control group. The p value was highly significant in intervention group as compared to control group.

Table 4. Comparison of marks of lecture 1 to lecture 5 in both the group at post test

| | Group | Mean±SD | t-value | p-value |
|-----------|--------------|-----------|---------|----------|
| Lecture 1 | Control | 5.65±0.84 | 2.84 | 0.005,S |
| | Intervention | 6.10±1.33 | | |
| Lecture 2 | Control | 5.68±0.82 | 5.83 | 0.0001,S |
| | Intervention | 6.62±1.38 | | |
| Lecture 3 | Control | 5.90±1.04 | 5.44 | 0.0001,S |
| | Intervention | 6.83±1.34 | | |
| Lecture 4 | Control | 5.97±1.07 | 6.35 | 0.0001,S |
| | Intervention | 7.04±1.29 | | |
| Lecture 5 | Control | 5.92±1.04 | 7.28 | 0.0001,S |
| | Intervention | 7.09±1.22 | | |

S:Significant

Perception: After the study perception of students from intervention group was taken. Their expressions in short were as follows. 90% percent of students reported animation has created interest in learning the topic. 60% students reported there should be animation facilities in development of critical thinking. 80% students reported they were able to understand lec-

ture with the use of animations. 85% students reported animation will help in recall of knowledge during exams. 90% students reported animation be incorporated for important and maximum topics. 90% students suggested animation should be incorporated in maximum topics of all the subjects. Overall students have shown inclination towards the understanding and learning by use of animations.

DISCUSSION

As the students admitted to study the medicine by entrance test are supposed to be higher IQ level than normal students studying art and commerce stream. So we supposed there should be no conflict about average and high IQ level, all students are more or less of the same IQ level. They were grouped as 100 students in control group and 100 students in intervention group. Study was carried out for a particular series of lectures for a particular portion of physiology for 1st MBBS students.

The authors Miri Barak et al stated that “We found that the use of animated movies enhanced students thinking skills, in terms of science of understanding, knowledge implementation, and reasoning ability” [5]. We found that our results are falling on the lines of this study.

Study by Joshi et al states “After statistical analysis significant improvement in the knowledge was observed with the use of overhead projector slides, while highly significant improvement in knowledge and understanding was observed using animation tool. Visual impact is more effective”[7-11]. Results of our study are similar as per study done by Joshi et al.

Kim et al in his study observed that fourth graders low in NFC (mark list) rated animated graphics as more enjoyable and motivating. Low NFC fourth graders may be after seeing animations and sharing task characteristics with television find them higher motivating and enjoyable, because they think that they have to put less effort into understanding the presented contents [10]. Our study results are similar to the lines of this study.

One of the study quoted that some researchers claim that animations may evoke misconceptions and hinder meaningful learning [9]. This study shows their findings of that particular study. May in their view and study be the observations are opposite to our findings but other studies are showing the results which are falling similar to our findings. The findings of this study and other studies [7, 8] indicate quite the opposite.

Usual mode of learning is routine and proven to be best mode of teaching and learning and cannot be

replaced by any mode of learning. Usual mode of learning like chalk and board, LCD projectors for slides are no doubt be replaced by any means as they are handy easily available and cheap and works in any condition.

Our study states that in addition to usual mode of learning the use of animation will be an added advantage for the learning process. Animations give an added impact on understanding by the cognitive mode. Animations can improve the students thinking, reasoning and remembering process by having a visual impact.

CONCLUSION

According to the MCQ and feedback analysis, the results showed that teaching didactic lecture along with animation is an added advantageous method for making the students to learn and understand the physiology better rather than by using didactic teaching alone.

Take home message: Animation can be an added powerful tool in understanding & learning physiology.

Implication: Incorporation of animation along with power point presentation has tremendous potential for learning with enhancing their cognitive mode of understanding and can be used for enhanced understanding and learning of physiology for 1st MBBS students.

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