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Audience Response Systems (Clickers) for Active Learning Approach Amongst Operation Room Technicians – An Observational Study

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ABSTRACT Active learning is the process wherein students are actively involved in understanding facts, activities and skills through the directions of the instructors tasks and activities. It involves the use of cognitive processes rather than behavioral processes. In this study the efficacy of Audience response systems on student performance and preference as compared to traditional class discussions was studied. **Materials & Methods :** Two batches of Operation room technicians were randomized into Group A which received training using Audience response systems(ARS) with power point interactive lectures and Group B which received the same power point lecture with class discussions. Both the groups were   subjected to an MCQ test and feedback obtained on their opinion on the new method of interactive teaching . **Results :** There is evidence from feedback to support benefit of ARS (Audience response systems) in interactive learning compared to traditional class discussions. However, the results in performance remained statistically not significant in the two groups.

KEYWORDS :Active learning , Audience Response systems, clickers, interactive poll, teaching in medicine

INTRODUCTION

Operation room technicians require a sound knowledge of basics of anaesthesiology, drugs and equipment, surgical procedures and instruments, sterilization and CSSD protocols and all aspects of running of operation theatres including equipment maintenance and record keeping. Training of operation room technicians requires practical hands on skill development with adequate training on equipment and procedures. Active learning approaches have been found to be useful in improving interest and retention of key points of training.

One way to use technology is using the student response systems. Also known popularly as Audience response systems (ARS) or Clickers they are extensively used for obtaining response from a group. New technology and portability enables these to be incorporated into a multimedia power-point presentation with each student having a handset with capability to answer multiple choice questions, true/false and one word answers. The instructor can intersperse these questions and obtain response from students which can be instantaneously projected on the screen in a graphical manner. Responses can be stored by the instructor anonymously to record individual student performance while only group performance can be projected. In this manner the instructor can analyse whether a key point has been correctly understood by majority of the class. This can further lead to interactive discussions, explanations, examples to obtain a better performance from the class. Also, the instructor can pick up the weak students by assessment of individual performance for the needed extra attention. Thus, it serves as an important teaching tool in modern day medical education.

In our study it was decided to evaluate Audience response systems in the performance of operation room technicians as compared to traditional classroom discussions and obtaining preference or otherwise on this relatively new tool of learning.

Aims: The aims of this study were to conduct an observational study to assess the effectiveness of audience response systems as an interactive learning and teaching tool amongst operation room technicians.

Objectives: The objective of this study was to introduce an active learning tool and conduct a study on student preferences on using clickers in the classroom .

Methods :

This study was approved by the ethics committee and all students were informed about the study and consent taken . The study was carried out after 2 months of familiarization with the equipment and software by both the instructors and students on planning of questions, lesson plans and power-point design of the topics to be presented.

Two batches of Operation room technicians undergoing their training in operation room techniques were enrolled for the study and were block randomised into two groups Group A & Group B each group having 24 students.

Group A students received training session1 on WHO Safety checklist in operation theatre using clickers while Group B received the same training without clickers as lecture and group discussion. A standard MCQ examination common to both groups was conducted as a post test .

A second training session 2 on Biomedical waste disposal was conducted for both the groups with Group A receiving training without clickers and Group B receiving the lecture with Clickers (Audience response system). A similar post test MCQ was conducted for both groups. In the end a feedback proforma was given to both Groups to rate their experience/preference on the use of clickers on a scale of 5 .

Figure 1 : Students using Clickers (ARS)

STATISTICAL ANALYSIS

Results were evaluated and analysed using Mean +/- SD for both groups in the post tests with or without clickers for the training sessions and by using students "t" test for any significant difference

Figure 2: AUDIENCE RESPONSE SYSTEM

RESULTS

Results of Training Sessions 1 (WHO safety checklist for Group A (with ARS clickers) and Group B (without ARS) and Training session 2 (Biomedical waste disposal) for Group A (without ARS) and Group B (with ARS) are tabulated in Table 1 as follows.

Training Session	Group	Clickers (ARS)	Mean +/- SD	P value
1. WHO Safety checklist	Group A	YES	7.91+/- 0.71	0.104 NOT significant
	Group B	NO	8.25 +/- 0.67	
2. Biomedical Waste Disposal	Group A	NO	7.75 +/- 0.67	0.411 NOT significant
	Group B	YES	7.91 +/- 0.71	

Table 1 : Results of Post test after training sessions

Both Groups were asked to submit a feedback proforma to rate their preference/ utility on the effectiveness of ARS (Clickers) in the training sessions on a scale of five.

Key	5	4	3	2	1
N= 24	Strongly Agree	Agree	No preference	Disagree	Strongly disagree
Gp A	9	12	13	-	-
Gp B	9	9	4	2	-

Table 2 : Feedback from students on using ARS

DISCUSSION

Active learning tools can be effectively used by the instructor to encourage student participation and provoke deeper thinking with a problem solving attitude. Audience Response Systems (Clickers) are an effective tool to monitor students and provide instantaneous feedback to evaluate understanding and conduct in class quizzes. In medical education where concepts and skills need to be mastered at a high level this becomes extremely important .

A study by Cummings et al 1 has evaluated that Audience response systems have a great pedagogical value that can help students pay attention in class and be more involved in a learning friendly environment

Another study by Margie Matyn 2,3,4 has described clickers in the classroom to be part of an active learning approach perception study results had students who used clickers having higher mean scores.

In our study though there were no statistically significant outcomes on learning outcomes student preferences were in favour of clickers as a versatile interactive learning tool .The database of student performance available to the instructor was invaluable feedback about own teaching skills and student level of understanding of the subject. There was no need to conduct separate examinations to assess performance when clickers were used. More studies are required to validate improvement in learning outcomes.5 Till then, audience response systems (clickers) will continue to be a useful tool for both instructors and students alike to promote interactive dynamic classrooms.

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