

Effective Use of Pause Procedure to Enhance Student Engagement and Learning

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ABSTRACT

Introduction: Active learning strategies have been documented to enhance learning. We created an active learning environment in neuromuscular physiology lectures for first year medical students by using 'Pause Procedure'.

Materials and Methods: One hundred and fifty medical students class is divided into two Groups (Group A and Group B) and taught in different classes. Each lecture of group A (experimental Group) undergraduate first year medical students was divided into short presentations of 12-15 min each. Each presentation was followed by a pause of 2-3min, three times in a 50 min lecture. During the pauses students worked in pairs to discuss and rework their notes. Any queries were directed towards the teacher and discussed forthwith. At the end of each lecture students were given 2-3 minutes to write down the key

points they remembered about the lecture (free-recall). Fifteen days after completion of the lectures a 30 item MCQ test was administered to measure long term recall. Group B (control Group) received the same lectures without the use of pause procedure and was similarly tested.

Results: Experimental Group students did significantly better on the MCQ test (p -value<0.05) in comparison to the control Group. Most of the students (83.6%) agreed that the 'pause procedure' helped them to enhance lecture recall.

Conclusion: Pause procedure is a good active learning strategy which helps students review their notes, reflect on them, discuss and explain the key ideas with their partners. Moreover, it requires only 6-7 min of the classroom time and can significantly enhance student learning.

Keywords: Active learning strategies, Control group, Experimental group, Long term recall, Pause procedure

INTRODUCTION

Active involvement of students in educational process leads to enhanced learning and better academic performance [1]. The ultimate goal of content instruction is to provide knowledge to students. We as teachers can change the shape of our content instruction so as to facilitate reflection. Meaningful and effective way to bring closure to a learning unit is to facilitate making of connections between important learning ideas. If simple active learning ideas are incorporated during the classroom time then they can become the most important kind of connections in the entire class. We should create fun in learning so that students run home study and contemplate to really learn [2]. Stuart and Rutherford in their work showed that student concentration rose sharply to reach a maximum in 10-15 min, and fell steadily thereafter [3]. For most of the teachers incorporating brief active learning strategies during lectures can alleviate many of the weaknesses of a traditional lecture format [4]. The 'pause procedure' is one active learning strategy which requires very little class time and can significantly enhance student learning. The idea of breaking the lecture into brief pauses was categorically described in the work of Rowe et al., [5]. Their work suggests that pausing in between lectures after every 13-28 minutes will increase student attention and learning. Ruhl and her colleagues conducted a study where she used 'pauses procedure' every 12-18 minutes during her class and compared these students with those in one employing the traditional lecture class. During the pause procedure the students worked in pairs for two minutes. They discussed their notes and reworked on them, there was no instructor-student interaction [6].

There are a number of teaching learning methods and styles that encourage lifelong learning and increased adaptability in teaching-learning process [7]. Involving students actively during the lectures is regarded as more effective teaching/learning tool during traditional lecture format. To create student interest novel teaching strategies

need to be planned, which requires time and a commitment from the teacher as well [8].

We tried to create an active learning environment in the first year undergraduate medical students physiology lectures by using the 'pause procedure' and compared these students with the second group of students not exposed to this concept, who attended lectures in the usual traditional lecture format.

MATERIALS AND METHODS

The first year medical student class of 150 students has been divided into two Groups – Group A and Group B of 75 students each. Group A served as the experimental Group and Group B as the control Group. Each class of Group A (experimental Group) undergraduate first year medical students was divided into short presentations of 12-15min each. Each presentation was followed by a pause of 2-3min, three times in a 50min lecture. We had planned ahead by scheduling pauses at appropriate time during the lecture. During the pauses students worked in pairs to discuss and rework their notes, compare their notes and filling missing information. During this period they could also discuss and explain to their partner the key ideas of the lecture. Any queries were discussed in student pairs; if still unclear the queries were directed towards the teacher and discussed forthwith. At the end of each lecture students were given 2-3min to write down the key points they remembered about the lecture (free-recall). The use of pause procedure involved only 6-7min of extra time. Fifteen days after completion of the lectures a 30 item MCQ test was administered to measure long term retention. Group B (control Group) received the same eight lectures without the use of pause procedure and was similarly tested on an identical test. Out of the total 75 students in each Group, 74 students in Group A and 74 students in Group B attempted the test. Student feedback on the significance of pause procedure on lecture recall, understanding of concepts, interaction with peers and reflection of

learning with a few close ended (on a 5 point likert scale) and a few open ended questions were also obtained.

RESULTS

The results of the experimental and control Group on a 30 item MCQ test revealed that experimental Group did better on the test. [Table/Fig-1] presents the mean \pm SD of the marks obtained by Group A (Experimental Group) and Group B (Control Group). The mean percentage and standard deviation for correct answers for Group A (n=74) and Group B (n= 74) were 23.0 ± 5.37 and 21.05 ± 5.6 respectively. Unpaired t-test was used to evaluate differences on the tests in both the Groups. The tests revealed that the experimental Group students performed significantly better ($p < 0.05$) than the students of control Group on an identical test. The student feedback revealed that 83.6% students agreed that the pause procedure helped them in enhancing the lecture recall. Most of the students (85.9%) also felt that it helped them in better understanding of the concept, while 80.1% students agreed that the pause procedure help them in better interaction with their peers. 82.5% students felt that end of the lecture free recall gave them the opportunity to reflect on what had been taught in the class as well as an opportunity to talk and share their views with the peers in the class itself. Some students felt that the pause gave them a breather to get themselves together during a long class; this gave them an opportunity to get back to the rest of the lecture with heightened interest. They were happy about the instant review and clarification of multiple queries they had in their minds.

Groups	N	Marks (MM=30) Mean \pm SD	SEM	t-value	p-value
Group A (Experimental Group)	74	23.0 \pm 5.37	0.624	2.159	0.032
Group B (Control Group)	74	21.05 \pm 5.59	0.649		

[Table/Fig-1]: Marks obtained by two groups of students in the test
 $p < 0.05$ = significant, n = No. of students who appeared in the test
 SD=Standard Deviation, SEM=Standard Error of Mean

DISCUSSION

In this study we incorporated 'pause procedure' as an active learning strategy in traditional lecture format and tried to find its effectiveness by evaluating the marks they obtained in the 30 item MCQ test administered after 15 days of completion of the lectures to measure long term retention and the student feedback on the use of pause procedure to enhance lecture recall.

The use of various active learning strategies have grown in number of years, so have the studies examining the efficacy of these studies in traditional classroom settings. A study conducted by the author to see the effectiveness of using active learning strategies on respiratory physiology lectures found that heightened interest, understanding and interaction engaged students in learning process. Using a no. of active learning process increased both teacher and learner enthusiasm [9,10]. Sometimes it is difficult to use multiple teaching techniques, especially in the paucity of lecture time. So a simple procedure, i.e., a pause procedure was tried with good results and feedback from students.

Collaborative learning exercises like pause procedure, think-pair and share are active learning strategies which can be used effectively in large classroom settings [6]. The advantage of these procedures is that they require less time in preparation, students get time to reflect back, discuss in their Group and delve deeper into the material. Collaborative thinking also enhances critical thinking [11]. The pause procedure also helps student to review, compare notes and briefly reflect on the lecture. Thus, it also promotes self-monitoring. They can discuss the main ideas with their partners in continuum of response to some reflective questions [6].

Johnson and Smith suggested alternative 10-15 minutes mini-lectures with informal Group work that addresses some aspect of the lecture e.g., specific homework problems, non-graded quizzes, quick writes, student-student discussion and comparison of notes [12].

Bonwell suggested that it is a good idea to mix the pause assignments to include reviewing notes, think-pair-share activities, short writes and formative ungraded quizzes. He suggested that pausing the lecture allows students to deal with the physiological and psychological responses that keep them from listening effectively for longer periods, on resumption of the lecture they then are able to return to their peak listening efficiency [13]. In our study as well students felt that the pauses gave them a 'breather' to disengage from the continuous lecture and gave them the time to reflect back, review, discuss and pose questions on the unclear aspect. This gave them the necessary base to get back to the rest of the lecture with increasing vigour.

Student engagement in the classroom setting was studied by Umbach and Wawrzynski. The findings indicated a moderate to strong correlation between faculty driven instructional design and student autonomy in the classroom. Students reported that they were engaged in their own intellectual development when the faculty created cognitively challenging environments [14].

As is well-documented, the student concentration rises sharply for 15min and then steadily declines [3]. Hartley and Davies found that the number of students paying attention begins to drop dramatically and therefore immediately after the lecture students remembered 70% of the information presented in first ten minutes and 20% of the information in the last ten minutes of the lecture. Pausing may also be helpful because the students mind begin to wander and this break provides them the opportunity to start fresh again, keeping students engaged [15].

The syllabus is so vast that the teacher tries to present maximum possible information to the students. With so much to take back home, students have very little time to comprehend, analyse and form connections with the educational material. It is best to plan educational strategies and active learning activities to engage the class and add meaning to what is taught.

CONCLUSION

The 'Pause procedure' is an extremely easy and effective approach to promote greater student engagement with very little modification to the traditional lecture. Moreover, it requires very little lecture time. It requires just a little planning ahead to ensure that learning is stimulated in the classroom. At the same time pausing is effective only when the activities during that time stimulate and facilitate students to comprehend, reflect and learn the material. So let's dream big but at least start with small steps in introducing active learning strategies in the classroom.

REFERENCES

- [1] Rao SP and Di Carlo SE. Active learning of respiratory physiology improve performance on respiratory physiology exam. *Adv Physiol Educ.* 2001;25:55-60.
- [2] DiCarlo SE. Too much content, not enough thinking, and too little FUN! *Adv Physiol Educ.* 2009;33:257-64.
- [3] Stuart J and Rutherford RJ. Medical student concentration during lectures. *Lancet.* 1978;2(8088):514-16.
- [4] Bonwell, Charles C. Enhancing the Lecture: Revitalizing a Traditional Format. Using Active Learning in College Classes. *NDTL.* 1996; 67:31-44.
- [5] Rowe, M. Pausing principles and their effects on reasoning in science. In *Teaching the Sciences*, edited by F Brawer. San Francisco, CA: Jossey-Bass Publishers 1980.
- [6] Ruhl, K, C. Hughes, and P. Schloss. Using the pause procedure to enhance lecture recall. *Teacher Education and Special Education.* 1987;10:14-8.
- [7] Anyaehie US, Nwobodo E, Njoku CJ, Inah GA. Comparative Evaluation of Active Learning and the Traditional Lectures in Physiology: A case study of 200 level Medical Laboratory Students of IMO State University, Owerri. *Nigerian Journal of Physiological Sciences.* 2007; 22(1-2); 117-21.

- [8] Vaughn L and Baker R. Teaching in the medical setting: balancing teaching styles, learning styles and teaching methods. *Medical Teachers*. 2001; 23(6):610-12.
- [9] Thaman RG, Dhillon S, Saggar S, Gupta M, Kaur H. Promoting Active Learning in Respiratory Physiology – positive student perception and improved outcomes. *N journal of physiol and pharmacol*. 2013;3(1):27-34.
- [10] Thaman RG, Arora A. Adopting Role Plays/skits to enhance learning of clinical Respiratory Physiology. *Adv Physiol Educ*. 2012; 36: 358-59.
- [11] Gokhale AA. Collaborative Learning Enhances Critical Thinking. *Journal of Technology Education*. 1995. 7(1).
- [12] Johnson DW, Johnson RT, and Smith K. Cooperative learning: Increasing college faculty instructional productivity 4th ed. Washington, DC: The George Washington University, School of Education and Human Development (1991).
- [13] Bonwell C. The Enhanced Lecture: A Resource Book for Faculty. Cape Girardeau, MO: Southeast Missouri State University, Center for Teaching and Learning. 1991.
- [14] Umbach PD and Wawrzynski MR. Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education*. 2005; 46(2):153-84.
- [15] Hartley J and Davies I. "Note Taking: A Critical Review "Programmed Learning and Educational Technology. 1978; 15 (3): 207-24.

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