



The Relative Impact of Discipline, Lectures, and Usage of Equipments on the Learning of Medical Sciences Students

KEYWORDS

discipline, lecturing method, teaching equipments

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ABSTRACT *The purpose of this research was to determine the relative impact of factors like the deployment of discipline, lectures, and equipments on the learning of medical sciences students. The study was cross-sectional on medical physics field in 2012-2013. The participated medical sciences students were divided into two groups. One group had the restrictions needed; the other was left to go on randomly. A Medical Physics exam was administered to both groups, three times, each time including two chapters of the source book: Introduction to Medical Physics. Scores were compared. Then a questionnaire, based on the same materials that the students had been lectured upon, materials relating to discipline, lecturing, and usage of equipments, was distributed among all participants. Also, they were asked of their own learning efficiency. T-test method was applied. The learning efficiencies for the first group were 95 ± 5 , 85 ± 1 and 89 ± 2 (respectively for the three exams) and for the second group were 45 ± 2 , 55 ± 10 and 50 ± 12 . The deployment of the above mentioned factors has relative impact on the improvement of the students' learning.*

Introduction:

Teaching Medical Physics requires an experienced lecturer in the field. Relying on traditional ways of teaching, like boards and two-dimension curves, are doomed to fail (1). Medical physics learning is influenced by many factors; six key variables in adult learning are: prior experience, reflection, authentic experiences communication, dialog, discussion, self-assessment and correction, picture superiority effect and dual coding (2). Developing learning from its original proposal into some of its current refinements and applications today is the World Wide Web usage as a vast reference library (3). Many of us engaged in professional learning have a broad understanding of experience. Experience is source of learning and development. Using theatrical performance in medical education may facilitate learning and enhance empathy and team work communication skills (4). Observational research can be a cost-effective method to stimulate guided reflection and to improve the lecturing skills of faculty members (5). An iterative sequencing of lessons seems to facilitate learning and transfer, particularly, of mathematical procedures (6). The findings support an iterative perspective for the development of knowledge of concepts and procedures (7). Students with low background knowledge have higher accuracy in the generate condition, but the higher the background knowledge, the lower the advantage of generating answers (8). The benefits of generating answers may extend to unstudied items and to classroom settings, but only for learners with low background knowledge (9). Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students are a better way of learning (10). The scale may also enable faculties to assess students' status, design better lesson plans and curricula, and, implement appropriate teaching strategies for medical students in order to foster the growth of lifelong learning abilities (11).

The purpose of this research was to determine the impact of the deployment of discipline, lectures, and equipments on the learning of medical sciences students; for it seems negligence in applying them properly can be hurdles in the process of learning.

Material & Method:

The forty two medical sciences students who were all under 24 were divided into two groups, dental (group 1) and practical room students (group 2). The three factors of discipline

in class, lecturing method and new modern equipments were applied on group 1, and it was taken care that group 2 went on as randomly as possible. All the two groups passed medical physics exam as mid term exam for three times. A questionnaire, with questions about the above mentioned factors, was distributed to group 1. Information like social status, pastime activities, any published papers, experiential learning of any subject and learning styles were asked orally. The participants, coached by an experienced lecturer, were given a four-month preparatory period to study and review. A score evaluation performance after taking exam was followed by the lecturer in medical physics. The scores were meant to clarify for us whether learning had improved or not. The learning efficiency of the two groups was compared. A few students handed in the questionnaires blank. There were two options of excellent or poor for the answers. The learning efficiency was analyzed by paired observation T-test with p-value < 0.5.

RESULTS:

The average frequency of dental students answering excellent to each question respectively was 85%, 85%, 82%, and 89%, and the frequency of answering poor to each question respectively was 15%, 15%, 18%, and 11%. Comparing this with the results of practical room students which were 13%, 35%, 46%, and 62% (excellent option), and 87%, 65%, 54%, and 38% (poor option), it is somehow obvious that the determined factors have worked efficiently in the process of learning (table 1). The learning efficiency by taking medical physics exam for two groups with three factors were 95 ± 5 , 85 ± 1 and 89 ± 2 for first group and 45 ± 2 , 55 ± 10 and 50 ± 12 for group 2 (table 2). Comparing learning efficiency of the two groups showed performance of dental students with disciplines in class and new modern equipment showed higher than performance of practical room students without disciplines in class and new modern equipment. Questions analysis showed that students regarded the medical physics lesson as a good and useful one. The results of the questionnaire showed frequency of "excellent" replies was up to 3-7 times more than the frequency of "poor" replies. The "excellent" responses of dental students to questions were more than "excellent" responses of practical room students--85 to 39. Also, the ratio of "poor" responses of dental students to practical room students was 15 to 60.

Discussion:

Discipline in class in medical physics is a type of stimulation that activates students and leads to better teaching. Stimulation contributes a better students learning. Having an organized schedule is discipline. The designer of schedules for medical student should use modern equipment of education. The use of computers, as an example of modern equipments, contributes a lot to achieving more in learning (12). New modern equipments increasingly perform a significant role in learning. We have to bear in mind though that education providers and clinicians need to recognize that overuse of automated equipment may potentially de-skill future generations (13). It has to be noticed that the numbers of results found here, absolutely have the influence of the subject material within, and as was mentioned before, students find Medical Physics a little difficult to get along with (table 1). It is necessary to schedule before lecturing. For example, nuclear physics needs to be accompanied with practice for better learning and comprehension (14). In table 1, the percentage of interested students in learning by advanced equipments is 85%. In other words, the analysis of questionnaires shows that students learn more using computers. However, to have active students it is necessary to raise their motivation. Students who have reviewed the subject materials before appearing in class, helps in learning and makes the task of the lecturer much easier. In reality, these points can be understood from positive responses in the questionnaires. Following oral learning, there should be reviews and practices on the materials heard so it would be somehow registered in the mind (15).

Deploying discipline in class, lecturing method and new modern equipments do give the learners a chance to work on medical physics better though it is not simple on a real scale as it sounds. Lack of facilities, non-interested students, and such causes work as barriers in the research progress. The advantages of this project build cooperative learning conditions which result in teamwork and collaboration skills that are important in adult learning. Disadvantages might be that, dealing with people with diverse tastes, both students and teachers are meant, not everyone would be happy and satisfied with the restrictions of discipline, the method of the words being said and heard instead of having them written down, or the difficulties of working with equipments.

CONCLUSION:

Despite the barriers, the project was set successfully. The results we arrived at were positive and showed that discipline with scheduling, lecturing, and usage of new equipments have a considerable impact on students' better learning.

Table 1- Responses related to reply of questions to questionnaire

number of question	Responses of Dental students With applying three factors		Responses of Practical room students without applying three factors	
	excellent	Poor	Excellent	Poor
1				
2	85	15	13	87
3	85	15	35	65
4	82	18	46	54
	89	11	62	38

Table2. The learning efficiency of students groups after passing exam in percent.

student	Discipline in class	lecturing method	new modern equipments
Group 1	95±5	85±1	89±2
Group 2	45±2	55±10	50±12

Questionnaire:

Please answer the following questions:

- How efficient did you find discipline in improvement of learning?
a- excellent b- poor
- Reviewing the previous lessons at the beginning of each session was a/an ... idea.
a - excellent b- poor
- Using equipments helped in the process of learning in a/an ... way.
a- excellent b- Poor
- How did you find the method of lecturing efficient?
a- excellent b- Poor

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