

RESEARCH ARTICLE

Learning strategies in medical school: A holistic approach to physiology

Sheetal Ramakant Salvi, Neelambala Prasad

Department of Physiology, Dr DY Patil Medical College, Pimpri, Pune, Maharashtra, India

Correspondence to: Sheetal Ramakant Salvi, E-mail: shslvi@gmail.com

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ABSTRACT


Background: In medical college medical curriculum needs to be evaluated on a regular basis because students perception about the subjects should be known to the teachers. Assessment of medical students regarding the understanding of the subjects is useful in modifying and can be made two-way learning, more appealing, and enjoyable too. **Aims and Objectives:** Considering the above-known facts different learning strategies in physiology were evaluated among 500 medical students of consecutively 3 academic years of 3rd semester (II/I) students who had finished their physiology curriculum. **Materials and Methods:** This was carried out by providing an appropriate and well-structured questionnaire with 10 items containing different learning tools of physiology. They were asked to choose more than one option which aids in their understanding. **Results:** Frequency was expressed in percentage. A total of 500 students participated in the study. The most preferred learning tool was clinical as 81% students found practical hours of clinical examination interesting while 57% agreed for regular hematology practicals, 54% felt small group discussion interesting. On the other hand, 48% favored lectures and tutorials both. Preference of problem-based learning by 46% and 29% identified group activities in the form of seminars as useful. Spots by some 26%, and lecture demonstration was selected by 20%. Charts with models were least preferred learning tool by 12%. **Conclusion:** Basically, the study was helpful for students in appreciating different learning methods.

KEY WORDS: Learning Strategies; Physiology; Curriculum; Questionnaire; Evaluation

INTRODUCTION

It is recognized that teaching medical students require processes and procedures and this is different from any other educational courses. Medical students need to retain large amounts of information in their allotted course. Over the past few decades, medicine has undergone tremendous metamorphoses.^[1] According to the first year medical syllabus, the candidate has to study subjects, namely, anatomy, physiology, biochemistry, and community medicine

visits. Integrative physiology is relevant to postgraduate, undergraduate, and health professional programs, but each of these student populations has unique goals and attributes that will influence all areas of course design. However, students point of view if we give a thought of what they need to know and do after completion of the course is a key element in establishing learning objectives for a class.^[2] Physiology, basically, is the branch of biology that deals with the normal functioning of organisms, their parts including all chemical and physical processes. One of the intrinsically complex subjects like physiology is easily understood by diverse groups of students belonging to different courses in the institutions by providing different tools of learning.^[3] Considering above facts of different learning methods, therefore, the present study focuses on a holistic application in physiology by preferring different learning tools which are followed in the medical college.

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MATERIALS AND METHODS

The data were collected in 500 medical students for 3 consecutive years of the 3rd semester (II/I) who had finished their physiology curriculum, from D. Y. Patil Medical College, Pune. Assuming that the students have been well exposed in their first year of MBBS to different Physiology learning tools and would thereby choose the best option. The study was approved by Institutional Ethical Committee (IEC). None of the students suffered from any major medical or psychiatric illness. Enrolled students were briefed all the details of the study and objectives. Based on the learning methods practiced in the department of physiology, an appropriate questionnaire was assessed in the form of 10 items or different physiology learning tools were distributed among the students. The students were asked to choose the answer that best described their preference. They were allowed to select more than one option and were instructed that the information given by them is for the research evaluation purpose only and will be confidential. The identity of the students was not disclosed.

The questionnaire consisted of different learning tools regarding:

✓ Tick the most effective method of physiology learning

<input type="checkbox"/> Lectures	<input type="checkbox"/> Clinicals
<input type="checkbox"/> Tutorials	<input type="checkbox"/> Problem based learning
<input type="checkbox"/> Practicals	<input type="checkbox"/> Spots
<input type="checkbox"/> Lecture cum Demonstration	<input type="checkbox"/> Seminars
<input type="checkbox"/> Small group Discussion	<input type="checkbox"/> Charts & models

RESULTS

Data were collected and presented in tabular format. The preferences provided by students were subjected to percentage technique (%). Out of 500 medical students, the mean age was found to be 19.4 years. The most likely opted response by the students were more than three (minimum of one response and maximum of five) [Table 1]. Various learning methodologies taught in physiology [Table 2].

Clinical

When they were asked to choose among the 10 different learning tools. Out of 500 students (81%), students felt clinical practical hours interesting. One response by 15 (3%) students, 68 (13.6%) two response, while 106 (21.2%) gave three response and 222 (44.4%) opted for more than three response. Many had liking for clinical as one of the best learning tool; we assume that these students once they enter their 2nd year of medical school, their interest is more toward the clinical as they directly come in contact with different patients and they take keen interest as to how to examine them. Applying the basic clinical skills which already have been enriched in the 1st year so more students preferred clinical along with the other learning tools.

Table 1: Percentage frequency of opted responses

Response opted	Percentage
One response	11.2
Two response	52.8
Three response	85.5
>Three response	252.4

Table 2: Percentage frequency of learning tools

Learning methods	Percentage
Lectures	48
Tutorials	48
Practicals	57
Lecture cum demonstration	20
Small group discussion	54
Clinical	81
PBL	46
Spots	26
Seminar	29
Charts and models	12

PBL: Problem based learning

Hematology Practicals

For hematology practicals one has to prick oneself several times for learning basic blood tests which are painful so, therefore, almost 57% agreed for regular hematology practicals along with the other given options, it is natural for students being hesitant for pricking and taking their own blood sample. One response was by 9 (1.8%) students, two response, three response, and more than three as 46 (9.2%), respectively.

Small Group Discussion

Small group discussion is a most enjoyable way of learning by 54%. One response was by 12 (2.4%), two response 44 (8.8%), three response as 64 (12.8%), and more than three 146 (29.2%). Basically, the topic for discussion is already been taught in lectures, so the majority of their concepts are cleared. Those whose concepts are not clear, it can be well understood in small group discussion. Students find it good as its like a revision/recap for them also they get to know the important questions related to that particular topic.

Lectures

Lectures were favored by 48%. These students found lectures as one of the learning tools. Here lectures are conducted in morning hours where most of the students are fresh and awake. Every aspect of the topic is been imparted to the students within 45 min to an hour. One response opted by 8 (1.6%) students, two response 18 (3.6%), three response as 43 (8.6%), and more than three as 156 (31.2%), respectively.

Tutorials

Tutorials: Tutorials were preferred by 48% of students. Therefore one response was given by 4 (0.8%) students, two response was given by 32 (6.2%), three response as 42 (8.4%) and more than three as 147 (29.4%).

Problem Based Learning (PBL)

Probably PBL as a learning tool helps in critical thinking so was preferred by 46%: One response by 0 (0%) students, two response 24 (4.8%), three response as 49 (9.8%), and more than three as 150 (30%).

Seminars

Group activities like seminars are useful and identified by 29%: One response by 1 (0.2%), two response 3 (0.6%), three response as 5 (1%), and more than three as 58 (11.6%).

Spots

Spots were found by only 26%: One response by 3 (0.6%), two response 12 (2.4%), three response as 11 (2.2%), and more than three as 108 (21.6%).

Lecture Demonstration

Lecture Demonstration: Lecture demonstrations were least interesting to the students and 20% opted for it. Here students are passive learners. Thus only one response by 5 (1%), two response 14 (2.8%), three response as 18 (3.6%) and more than three as 82 (16.4%).

Charts with Models

Charts with models: Charts with models was not liked. It was observed only 12% of students opted for it. One response by 1 (0.2%) students, two response 3 (0.6%), three response as 5 (1%) and more than three as 58 (11.6%).

DISCUSSION

Students admitted to medical college come from diverse backgrounds. The transition from school to university undergraduate education is a big challenge due to a quantum leap in the volume of content. The study and course content are very vast for medical student's program than any other undergraduate courses.^[4]

The primary objective of the course is to have students be able to describe, understand the concepts, explain function of the cells, tissues, organs, organ systems of the human body, and sharpen their critical thinking. The goals of medical education should be student-oriented in which learning is an active and continuous process while teachers main role is to facilitate this learning

process and make student develop knowledge, skills, and attitude.^[5] In physiology, the subject is well imparted in the form of various lectures of different systems, tutorials, small group teaching, lecture demonstrations, clinical (bedside clinics), hematology practicals, problem-based learning, charts models, and spots. But very few students can be benefitted under the guidance of the teachers for preparing an effective presentations in the form of seminars.

According to our study important observation was that the students opted for different tools, although 11.2% opted only one response otherwise 52.8% found two response as their learning tool. While 85.5% and 252.4% choose three response and more than three response, respectively. Students were passionate about the clinical practicals. Although there is no direct contact of patients in 1st year, clinical practicals help in critical thinking and reasoning by offering students opportunities to repeatedly apply their learning in the clinical context of patient care, especially in the coming years. It is now becoming more commonly recognized that preclinical basic sciences years and the clinical postings have an impenetrable wall between them. Introduction of clinical experience in the 1st year has surely led to changes in health-care systems which would otherwise be didactic. Implementing early clinical exposure in medical schools definitely helps in acquiring knowledge and skills development by not replacing the basic sciences, but rather enriches and contextualizes that learning.^[6] While regular hematology practicals and small group discussion were too agreed, respectively. Small group discussion is many ways easier for learning in medicine stream because the topic has already been taught in the lecture and its kinda revision for them, often the results can be positive. On the other hand, lecture is conducted for the whole class in a short span, which is much more challenging and maximum information imparted in 45 min. Not to forget problem-based learning (PBL) students use their thinking cap for the given problem case or scenario to define their own learning objectives. Subsequently, they do self-study or group discussion and refine their acquired knowledge. Thus, PBL is not about the problem-solving *per se*, but rather it uses appropriate problems to increase knowledge and understanding. PBL also generates a more stimulating and challenging educational environment. Thus, PBL should not be underestimated.^[7] We felt lectures and tutorials both are better learning tools. Similar results are shown by other authors.^[8] Lecture demonstration and lectures can be interesting but keeping in mind the major limitation of both is that the listener is just passively receiving the material and feels mundane, sleepy and discussion is one way. There are various means and techniques by which these can be made effective, interesting and eye-catching. Learning is basically a cognitive process whereby an individual acquires the professional and ethical values, the biomedical, behavioral and clinical knowledge, reasoning, and psychomotor skills necessary for ongoing professional competence.^[9] Activities in the form of seminars can help to boost confidence but may not help in learning by everyone. Charts with models and spots were the least appealing learning tool. Not everyone shows interest, as there is a limitation for learning on models and spots, mostly are studied at the last moment of the examination. Therefore, physiologists should apply skills, thought processes and use in their bench research for

improving and monitoring learning in classrooms.^[10] Improvement in learning can be done by implementing various tools in the subject so that students are attentive, find it enjoyable, knowledgeable also critical thinking on their part can be made to understand the subject and further help them in making their foundation strong. This study is just a small attempt to gather the opinion about learning tools in physiology.

CONCLUSION

Although our study is a small one, the outcome will be helpful for designing, modifying and emphasizing physiology learning methods to the teachers of physiology. This will also enhance by identifying preferred learning tool and understanding the subject by the students, which will provide insights into student's perceptions and, therefore, be very useful in identifying their requirement in the learning process. Thus, the study will be implemented for further studies to be undertaken on larger scales to develop more understanding of students' opinion toward physiology learning.

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