

## Expected learning methodologies in pharmacy education in India

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### Dear Editor:

The pharmacy students, either of under graduate or doctor of pharmacy, have greater role in patient care and subsequent counselling [1], awareness among the people along with subjective knowledge and instruments handling. So, productive modern active learning-teaching methods are very necessary for the pharmacy students to fulfil their demand in the society as well as pharmaceutical industries.

#### *Traditional learning:*

Teaching method of any institution depends upon the course curriculum, students and the teachers. The traditional teaching was involved with the class lectures, seminars, assignments and practical. The teaching methodology was largely based on evaluation pattern and the classes were made more interesting and fruitful by clarifying the doubts with the help of text books [2].

#### *Problem based learning (PBL):*

But the demand was for the technologies, innovative ideas and more effective teaching where social media and internet were the biggest factors [3]. The effective teaching is student-teacher centric with lots of opportunities and barriers [4]. In 1960 problem based learning (PBL) was introduced first which was mainly focused on learning through the solving of problems followed by small group discussions and self-directed learning. The study pattern is still important in the field of pharmacy, due to the better response in academic result comparing to traditional teaching. Pharmacy students can improve their understanding while visiting hospitals or in practical training by improved PBL methods which should be incorporated promptly in pharmacy syllabus.

Case study is one of the important feature (included in Pharm D syllabus as per PCI regulations) of learning platform where student can utilize their knowledge and find out the solutions on the basis of problems. Tutorial and assignment classes can be utilized by the teachers for PBL pattern teaching in B.Pharm syllabus.

#### *Deep, strategic and surface approach learning:*

Deep approach learning (DAL) is nothing but an idea of conceptual learning. The gathering of knowledge, teaching-learning environment and optimum workload of students are the pillars of DAL and the result is enhancement of academic performances [5]. While teaching with deep approach, the students' ability, learning capacity and knowledge are the important aspects. The teaching methods and continuous motivation are the primary requirement for the deeper approach. The previous literature reported the significance of DAL in pharmacy students [6].

When students approach for deep study, they try to understand the study materials by applying their previous knowledge and referring the relevant contents with deep learning [7]. Even in the practical of pharmacy subjects the principles can be better understood from the specific Pharmacopoeias and selected text books. The simplest and relevant example is in the subject of pharmaceutical analysis (B.Pharm), where the knowing of factor calculation in classical titration requires deep studies. The studies on the subject pharmacotherapeutics, included in Pharm D syllabus, will be more knowledgeable

practice when the students will go for deep learning by correlating the three following subjects; medicinal chemistry, pharmacology and therapeutics. The motivation and providing of such contents are the responsibilities of the teachers.

When the knowledge and deep learning of content are admixed with logistic approach in a student to score higher grades, the study is called as strategic approach. The hard work of the student under the guidance of teacher, collection of appropriate study materials, choosing of preferable parts of syllabus and understanding of assessment criteria produce the maximum effect and result in strategic teaching- learning methods [8]. The study of topics prior to attending class helps the students to grab the more knowledge in the class.

Whereas, promoting surface learning is not acceptable, as mugging up of any topics in pharmacy is not worth. The subjects like posology, spectroscopy, pharmacotherapeutics, biostatistics, structural activity relationship in medicinal chemistry, titrations in analysis etc. can't be memorised without the understanding of the topics.

#### *Project based learning:*

The broad level of learning can be achieved by the project based learning. The impact of bachelor's, master's and Pharm D thesis is much greater when it admixed with traditional teaching [9]. In the curriculum of different universities/ colleges of India before implementing PCI new syllabus, already mentioned the project in B.Pharm VIII semester, however the project has been now officially included in the syllabus which will help the students to acquire the knowledge more logically.

The small projects can be practiced as per the elective subject chosen by the student. The project of M.Pharm is a good practice where different subject area can be covered. Formulation and development, analytical validation, pharmacological and preclinical screening are the important aspects in the master's project. Pharm D students do their project in the hospitals which are particularly hospital oriented and have an great impact in the field of medicines. KAP (knowledge, attitude and practice) study, prescription patterns, pharmacoeconomics, adverse drug reactions are the popular and interest area of the doctor of pharmacy students.

#### *Miscellaneous*

Learning with modern aid like smart classes with projectors and smart board are the current demand. The impact of technology with traditional teaching can improve the learning capacities in the students. The students from other than English medium can easily adopt the video classes and power point presentations.

#### **Conclusion**

The present write up focuses on the different learning methods practiced in pharmacy colleges of India and their impact as per syllabus governed by Pharmacy Council of India. Case studies, choice of elective subjects, learning through projects and problems can improve the knowledge level for the future pharmacists. The organizing of social awareness camp in the rural areas and primary schools of villages by the pharmacy colleges will help to know the importance of the pharmacy profession in the society. Today's need is not only the study through the subjects mentioned in the syllabus, but also the practice of the profession.

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## Shambaditya Goswami<sup>1\*</sup>, Ravindra Pal Singh<sup>1</sup> and Debjit Bhowmik<sup>2</sup>

<sup>1</sup>Department of Pharmacy, NIMS Institute of Pharmacy, NIMS University, Jaipur, Rajasthan, India and <sup>2</sup>Department of Pharmacy, Himachal Pharmacy College, Nalagarh, Solan, Himachal Pradesh, India

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\*All correspondences to: Mr. Shambaditya Goswami, Assistant Professor, NIMS Institute of Pharmacy, NIMS University, Jaipur, Rajasthan, India. E-mail: [shambampharma@gmail.com](mailto:shambampharma@gmail.com)