

EXPLORING TEACHING METHODS FOR UNDERGRADUATE STUDENTS IN ANAESTHESIOLOGY: BEST TEACHING PRACTICES – A REVIEW ARTICLE

Rupika E¹, Alfairose J¹

¹*Research Scholar, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth (Deemed to be University), SBV Campus, Pillayarkuppam, Pondicherry-607402, India

Corresponding Author: Rupika. E

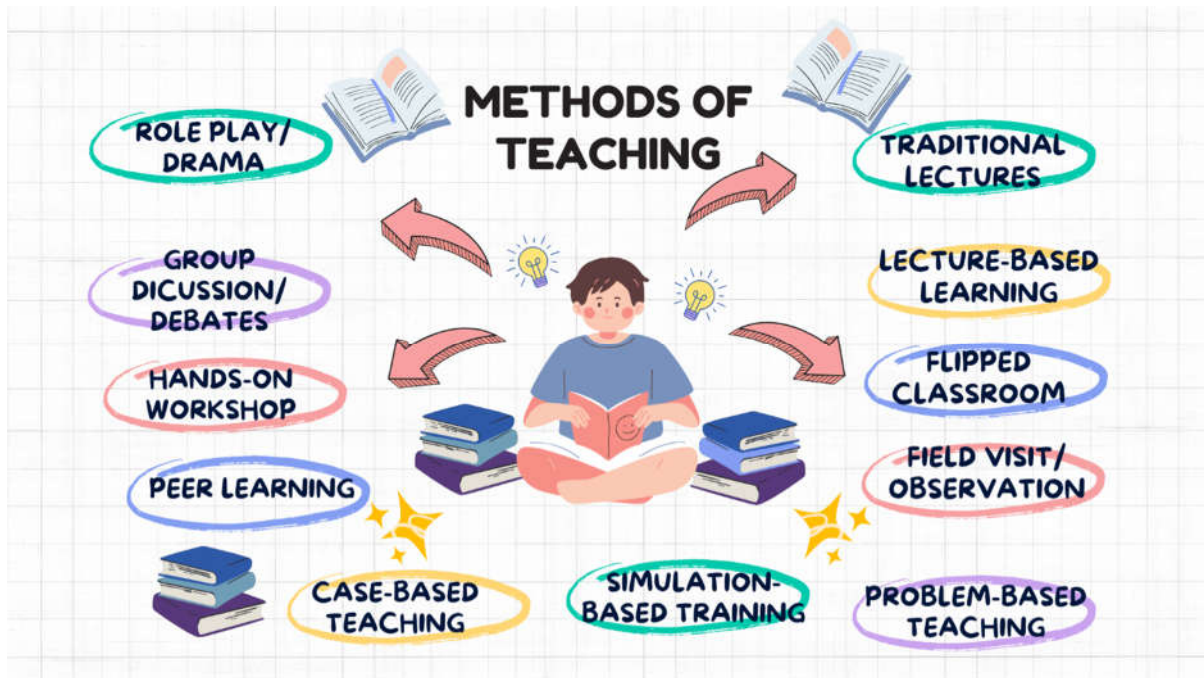
Address: Department of Anaesthesiology, Mahatma Gandhi Medical College and Research Institute (Sri Balaji Vidyapeeth- Deemed to be University), Pondicherry, India.

Abstract: The teaching and learning process helps the students gain knowledge from experts, creating future professionals. Various teaching methods are helpful in current medical education, but each method has its pros and cons. Healthcare professionals face challenges in addressing diverse learning styles among slow, average, and fast learners. Hence choosing the correct teaching method for a specific topic based on the objectives of the subject is essential. In this article, we discussed different teaching methods, with examples for anaesthesia technology students in Allied Health Sciences.

Keywords: Teaching methods, Anaesthesiology, Education, Undergraduate students, best teaching practices.

INTRODUCTION

Teaching and learning is a process in which students gain knowledge and skills from experts. In medical education, a good teaching and learning process will create tomorrow's professionals. There are various methods in the teaching and learning process such as the traditional teaching methods, lecture-based teaching and learning, learning through observation and field visits, problem-based learning, flipped classroom, simulation-based learning, peer learning, case-based teaching, hands-on sessions, and workshops. All these methods are very helpful in medical education. However each method has its pros and cons, they all were used in current medical education. Even methods such as group discussion, debate, role plays, and drama will also involve the students in the learning process. there is great confusion among healthcare professionals regarding which teaching method will be effective in improving the student's learning process. The great challenge faced currently is there are diverse students in the classroom from slow learners and average students to fast learners, and most of them have their own learning styles such as visual learning, auditory learning, kinesthetic learning, reading, and writing, interpersonal learning, solitary learning, etc.,. adapting to a good teaching method is essential. In this article, we discussed different teaching methods, with examples for anaesthesia technology students in Allied Health Sciences.



METHODS OF TEACHING:

1. TRADITIONAL LECTURES

The theory is “The pillar for practice.” When the students are trough with the theory it is easy to understand and implement in the clinical practice. Traditional teaching methods with good interaction between the teacher and the learner will be more effective¹. For example: “The pharmacology of anaesthetic drugs” and “The physiology of the respiratory system” can be taught using traditional teaching methods with interaction.

2. LECTURE-BASED LEARNING

This method will be helpful in explaining core concepts such as laws etc., Beyond the pros and cons of this method, it can be continued in medical education by involving the students in an interactive active learning process². For Example: “The mechanism of action of inhalational agents”, a PowerPoint presentation can be taken including diagrams and videos of gas exchange in lungs. “Patient positioning for surgical procedures” can also be taught using this method for better understanding.

3. FIELD VISIT/ OBSERVATION:

Enhancement in skills, better understanding, good communication, and satisfaction are achieved when medical students directly observe in the clinical settings³. Observation is most important to adapt to the real scenario in the operation theatres and also in wards, ICUs as well as OPDs. Hence students will practice the routine

4. PROBLEM-BASED TEACHING

Problem-based learning is to enhance critical thinking, clinical reasoning, and active participation of the students. It triggers students to set learning objectives, aims in self-directed study, and follow a step-based process to deepen understanding rather than directly solving the problems⁴. For example: “Management of Hypoxia in

Operation Theatre” creating a trigger that the patient has developed hypoxia suddenly in between the case and students can be questioned to find the measure taken to manage this case. Students approach problems by identifying the causes such as blockage in the tube, machine malfunction, and patient's clinical conditions. Another example is “drug dose calculation and dilution”. Students can calculate the drug dose in groups based on the clinical scenario given such as “Drug dose calculation for a 5-year baby under General Anaesthesia”

5. FLIPPED CLASSROOM

It enhances the in-depth discussion and active engagement during the session as they prepare previously. In a flipped classroom prework is done to acquire knowledge to develop good interaction during class time⁵. For example: “components of anaesthesia work station” if the students have learned about the components before as a prework, in the classroom hands-on session by performing machine checking, calibration, and troubleshooting issues which develop interactions.

6. SIMULATION-BASED TRAINING

It helps students to practice clinical procedures by creating the actual scenario which improves the technical and emergency acting skills. For example, performing emergency Rapid Sequence Intubation using a mannequin to perform intubation procedure which makes the students to engage in the real scenario and act faster in emergencies.

7. PEER LEARNING:

In peer learning, students from the same discipline support one another while they study.⁶ Most of the student's confidence levels will build up in this method of learning. As the students were in their regular posting in operation theatres discussing among themselves their case will improve the learning process. Most of the students were comfortable with peer teaching.

8. CASE-BASED TEACHING:

Case-Based Teaching is a method used in several medical specialties to help connect theory to practice and instill relevance through the use of real cases⁷. This is the scenario where theory is applied in the real world. For example “An 89-year old with type-2 diabetes mellitus, systemic hypertension and has a history of angioplasty, posted for Total Hip Replacement Surgery” students can discuss preoperative, intraoperative, and post-operative anaesthesia management. Case studies can also be taken for discussion.

9. HANDS-ON WORKSHOP

Hands-on workshops will improve the interest among medical students in clinical practice⁸. It focuses on skill development and adhering to the regular practice of their career. For example: “setting up a workstation for a case” step-by-step guidance can be given to all the students and each student can be asked to perform the hands-on session. Preparation for Central Venous Cannulation (CVC), an invasive blood pressure monitoring setup can also be taught using the hands-on workshop

10. GROUP DISCUSSION/ DEBATES

Debate helps the students to explore the reasons, improves communication skills, improves self-confidence, and brings motivation this makes debate a valuable learning technique⁹ For example, discussing the pros and cons of providing general anaesthesia for the caesarean section.

11. ROLE PLAY/ DRAMA

Role play is effective in teaching clinical concepts.¹⁰ It develops communication and teamwork skills. For example: “Anaesthesia Management for Traumatic Brain Injury” students can act as a team by playing a specified role of anaesthesiologist, technician, staff nurse, or surgeon in stimulated emergencies. Role play for Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) can also be performed as a team.

DISCUSSION

Many research articles may suggest one teaching method is better than another. Rizwan Faisal et al (2016), suggested that in terms of medical student's academic performance, problem-based learning is more effective than lecture-based learning.¹¹ Bijli Nanda et al. (2019) recommended both PBL and traditional approaches can be used in India's future medical curriculum.¹² Rishi Kumar Bharti (2023) suggested incorporating role play in the medical syllabus to achieve the objectives.¹³ Gastin Gabriel Jangkang et al. (2023) suggested introducing debate learning among medical students⁹. Col Rashmi Datta (2012) suggests following simulation-based medical education¹⁴. Chukwuka Elendu (2024), in the article, said that simulation-based education is effective compared to traditional teaching though it is difficult to implement¹⁵.

CONCLUSION

A single teaching method will not be effective in developing the student's knowledge and skill. Using appropriate teaching methods for a suitable topic is more important, as it will help improve the student's learning outcomes. Adhering to multiple teaching methods based on the subjects and topics will greatly help the students in understanding as well as in gaining clinical skills.

Conflicts of Interest:

The authors declared that there is no conflict of interest in the study.

Author Contributions:

All authors have significantly contributed to the study's conception and design, as well as the analysis, and have read and agreed to the published version of the manuscript.

Funding: Nill

REFERENCES

1. Bala S, Babu S, Muralidharan S. Comparison of Traditional lecture and Interactive Teaching Methods in Large Group Teaching of Non-Communicable Diseases: A Quasi-Experimental Study. *Healthline*. 2024 Aug 25;15:107–12.
2. Shrivastava S, Shrivastava P. Lecture at Crossroads in Medical Education: Is it Time to Say Goodbye or Introduce Specific Strategies to Enhance their Effectiveness? *Curr Med Issues*. 2022 Oct 1;20:259.
3. Hanson J, Bannister S, Clark A, Raszka W. Oh, What You Can See: The Role of Observation in Medical Student Education. *Pediatrics*. 2010 Oct 1;126:843–5.
4. Wood DF. Problem based learning. *BMJ*. 2003 Feb 8;326(7384):328–30.
5. Phillips J, Wiesbauer F. The flipped classroom in medical education: A new standard in teaching. *Trends Anaesth Crit Care*. 2022 Feb;42:4–8.
6. Sriwigati D, Musharyanti L. Benefits and challenges of peer learning methods in health professional students: A literature review. *Bali Med J*. 2022 Nov 14;11:1626–31.
7. McLean SF. Case-Based Learning and its Application in Medical and Health-Care Fields: A Review of Worldwide Literature. *J Med Educ Curric Dev*. 2016 Apr 27;3:JMECD.S20377.
8. Sanderson C, Mazhar K, Goldberg M, Chitnis S, Hays R, Dave H. Enhancing medical student interest in careers in the clinical neurosciences through a hands-on procedure workshop. 2022.
9. Jangkang G, Nurikhwan P. Debate Develops Medical Students' Critical Thinking. 2023 Jul 9;3:37.
10. Goothy SS, D S, Swathi M. Effectiveness of Academic Role-play in Understanding the Clinical Concepts in Medical Education. *Int J Res Pharm Sci*. 2019 Apr 14;10:1205–8.
11. Faisal R, Ur Rehman K, Bahadur S, Shinwari L. Problem-based learning in comparison with lecture-based learning among medical students. *J Pak Med Assoc*. 2016 Jun 1;66:650–3.
12. Nanda B, Manjunatha S. Indian medical students' perspectives on problem-based learning experiences in the undergraduate curriculum: One size does not fit all. *J Educ Eval Health Prof*. 2013 Oct 31;10:11.
13. Bharti RK. Contribution of Medical Education through Role Playing in Community Health Promotion: A Review. *Iran J Public Health*. 2023 Jun;52(6):1121–8.
14. Datta R, Upadhyay K, Jaideep C. Simulation and its role in medical education. *Med J Armed Forces India*. 2012 Apr 1;68:167–72.
15. Elendu C, Amaechi DC, Okatta AU, Amaechi EC, Elendu TC, Ezech CP, et al. The impact of simulation-based training in medical education: A review. *Medicine (Baltimore)*. 2024 Jul 5;103(27):e38813.