

Integrated Teaching: Boon or a Bane?!

Sushma R Kotian, Antony Sylvan D Souza, Nandini P Bhat, Anne D Souza & Mamatha Hosapatna*

Manipal University, Karnataka, India

Abstract

The objective of the present study was to evaluate the effectiveness of integrated teaching program using student feedback. A questionnaire to evaluate the effectiveness of the existing teaching program was prepared and distributed among 185 second year medical undergraduate students who underwent integrated teaching in their first year. Their responses were recorded, evaluated and analysed statistically. Additionally the performance of the students was also assessed by recording their year-wise results in the university examinations. This was further compared with the results of the students who were not exposed to integrated teaching in the past years and the findings were tabulated. Integrated teaching was found to be an innovative method in strengthening the teaching-learning process and received wide acceptance from the student population.

Keywords: *Integrated teaching, video demonstration, case presentation, conventional teaching, didactic lectures*

* Ms. **Sushma R Kotian** works as a lecturer in the department of Anatomy, Kasturba Medical College, Manipal University, Manipal. She is actively involved in various research activities and integrated teaching programs.

Dr. **Antony Sylvan D Souza** is the Professor and Head of the department of Anatomy, Kasturba Medical College, Manipal University, Manipal. He is the pioneer to introduce integrated teaching in the first year curriculum in Anatomy. He is also actively involved in various research activities.

Dr. **Nandini P Bhat** is a postgraduate in the department of Anatomy, Kasturba Medical College, Manipal University, Manipal.

Dr. **Anne D Souza** serves as Assistant Professor in the department of Anatomy, Kasturba Medical College, Manipal University, Manipal. She is actively involved in various research activities and integrated teaching programs.

Dr. **Mamatha Hosapatna** is the Assistant Professor in the department of Anatomy, Kasturba Medical College, Manipal University, Manipal. She is interested and actively involved in integrated teaching programs and various research activities.

Correspondence: mamatha2010@yahoo.com

Introduction

The pre-clinical subjects like Anatomy, Physiology & Biochemistry are taught to MBBS students in their first year separately without much correlation to each other. Students may lose interest in the subject as it involves didactic lectures and evaluation based on pure recall rather than comprehension and analysis. It is essential to understand the importance of these subjects in their future curriculum and practice. The integration between the preclinical subjects is also essential to correlate the facts. Therefore, to bridge this gap between the subjects and to acquaint the students with clinical scenarios, integrated teaching is in practice.

Integrated teaching (IT) aims to cater to the students' needs and make the subjects clear and understandable. IT is involved in connecting skills and knowledge from multiple sources and experiences and applying skills in various settings. It therefore helps in bridging connections between academic knowledge and practicals (Huber & Hutchings, 2004).

Medical education mainly aims at producing medical professionals with good clinical competencies and community orientation with proficient communication skills. This becomes very important in the treatment of daunting health problems (Paul, 1993). Tremendous responsibility is vested on the institutions providing medical education to bring about required innovations in the existing system (The Edinburgh Declaration, 1988).

Majority of medical colleges in India follow the traditional curricula in teaching. This is disciplined based, teacher centered, and examination oriented. Such modules are under criticism for placing too much emphasis on memorization of facts and figures and for overloading the students with excessive details (Harden et al, 1984). As a result, students are unable to correlate the basis of clinical problems or cases and thus could face problems during the diagnosis and treatment of a patient (Dandannavar, 2010). Teachers should assume a new role of facilitating the process of active learning rather than overloading students with excessive details through a series of elaborate lecture and voluminous book. Thus a student centered approach helps to make learning a pleasure and subsequent use of knowledge in an effective manner in clinical practice (Lemos et al, 2014).

Methodology

Integrated teaching program in our institution

In our curriculum, IT programme has been implemented and effectively practised from the past four years. It involves video demonstrations of dissected specimens, guest lectures by the clinical faculty and case presentations by the students. This is practiced in addition to conventional teaching methods.

Description of IT methodologies practiced:

1. Case presentations:

A group of 25 students were given a case on a particular organ system which contained questions related to its anatomy, physiology and biochemical analysis. The students were given a month

time for preparation and it was presented by the members of the group. A panel of faculties was assigned to judge the same.

2. Lectures by clinicians:

Lecture sessions by clinicians were organized by Department of Anatomy once a month. The topics were chosen in such a way that they are correlated to the particular preclinical topic which is been taught.

3. Video demonstrations:

Demonstration of dissected specimens by the faculty members at the end of academic year was introduced as a novel method for revision of the subject. The presentations were recorded and were uploaded in the computers of student learning center such that the students could access the same whenever required.

The present study is therefore an attempt to document the effectiveness of IT.

Study Design

The present cross sectional study was carried out involving 185 second year MBBS students (93 males and 92 females) who underwent Integrated Teaching (IT) in their first year. The study was conducted in Kasturba Medical College, Manipal University, Manipal and was approved by the Institutional Ethics Committee, Kasturba Hospital, Manipal. The age group of the students ranged between 18 to 20 years. All the students were given an option to participate or to decline the participation in the study. An informed consent was taken from the students who agreed to participate. A questionnaire was therefore constructed as shown in table 1, to acquire the students' feedback regarding the benefits of integrated teaching and its impact on their learning abilities and was distributed to them in the beginning of the academic year 2014-15. The students were encouraged to give their effective feedback. The responses ranged from strongly disagree to strongly agree with a Likert scale of 1-5. The results were expressed in percentages and were tabulated.

Table 1: A model questionnaire denoting effectiveness of integrated teaching (IT) assessed.

S. No.	Aspects assessed
1	IT gives confidence in approaching clinical cases and evokes interest in studying pre-clinical subjects
2	IT helps to bridge the gap between academic knowledge and its application in daily practice
3	IT is better than didactic lectures
4	IT should be conducted twice a month or more
5	IT would help them in preparing for their examinations
6	IT in pre-clinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum
7	View of better teaching technique a) Case presentation with discussion in small groups b) Seminars and brain storming session c) Video demonstration of clinical scenario followed by discussion d) Lecture by clinical faculty followed by discussion

Additionally the performance of the students was also assessed by recording their year-wise results in the university examinations. This was further compared with the results of the students who were not exposed to IT in the past years and the findings were tabulated. The results were expressed in the form of bar graphs and pie chart.

Results

IT has received tremendous positive response from the students. This also showed a positive impact on the examination results which had a progressive increase in the past three

years. The students who had passed out from the first year, when exposed to clinical scenarios, affirmed that integrated teaching programme was very helpful in confidently solving clinical cases and effectively correlating clinical with preclinical subjects thus arriving at an accurate diagnosis. This opinion was seconded even by the clinical faculty.

The students' responses to the questionnaire on IT revealed positive findings. 92.4% students agreed that IT gives confidence in approaching clinical cases and evokes interest in studying pre-clinical subjects (Graph 1: See the Appendix). 85.8% of students agreed that IT helps to bridge the gap between academic knowledge and its application in daily practice (Graph 2: See the Appendix). 73.4% stated that IT is better than didactic lectures (Graph 3: See the Appendix). 75% of the students agreed that IT should be conducted twice a month or more (Graph 4: See the Appendix).

But when asked, if IT would help them in preparing for their examinations, 55.1% students disagreed the same (Graph 5: See the Appendix).

Overall, 90.8% agreed that implementation of IT in pre-clinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum (Graph 6: See the Appendix).

When the students were asked to give their preferences on IT techniques, majority of them found video demonstrations beneficial in learning and revising while the case presentations helped them to develop the skills in public speaking. Students also affirmed that case presentations helped them a lot in detailed understanding of the subject in concern and also helped in building the quality of team work. Lectures by clinicians were interesting and encouraged them to study the pre-clinical subjects better.

Further the performance of the students was also assessed by recording their year-wise results in the university examinations. The results showed progressive increase in the overall results of the batches of students exposed to IT unlike to those who were not exposed to the same (Table 2).

Table 2: *First year MBBS University examination results in Anatomy in the last six years.*

Year	Result (In Percentage)
2009	92.8
2010	92.7
2011	95
2012	96
2013	97.2
2014	98

Discussion

Medical education strives to improve and maintain the quality of health care delivered by doctors to patients. This process is directly related to the quality teaching in medical colleges (Kasselbaum, 1989). There is a growing concern among medical teachers that conventional teaching methods fail to bring out the right qualities in the students. Most medical colleges in India have traditional teacher-centered and hospital based training.

Six education strategies have been identified relating to the curriculum in a medical school. Each issue can be represented as a spectrum or continuum: student-centred/teacher-centred, problem-based/information-gathering, integrated/discipline-based, community-based/hospital-based, elective/uniform and systematic/apprenticeship-based. This is popularly called as the SPICES model of curriculum. This SPICES model of curriculum strategy analysis can be used in curriculum planning or review, in tackling problems relating to the curriculum and in providing guidance relating to teaching methods and assessment (Harden, 1984).

There are four major components in IT namely Integration of experience, social integration, integration of knowledge and integration as a curriculum design (Beane, 1997). IT is an important strategy to promote meaningful learning and make it last for a longer time; integration helps to efficiently recall knowledge when required (Singh et al, 2013). It connects skills and knowledge and thus bridges the gap between academic knowledge and practicals (Huber & Hutchings, 2004). To improve the quality of students and to have effective diagnosis and better treatment of the patients, integrated learning is the need of hour. In recent years throughout the world such curricula have been used by faculties to teach the students (Irby & Wilkerson, 2003; Shimura et al, 2004; Damegh, 2005; Ghosh & Pandya, 2008).

The present study revealed that the average marks obtained by students after an integrated teaching approach was greater than the marks obtained by students after the conventional teaching methods. Few other Indian studies have also confirmed the same (Kate et al, 2010; Doraisamy & Radhakrishnan, 2013). Students trained with integrated curriculum were more accurate in diagnosis of the clinical disorders than those trained in a conventional curriculum (Schmidt, 1996). IT improves the cognitive and psychomotor domains of students and creates interest in topics and eliminates the fear toward the subject. The study by Schmidt et al (1996) did not take into account the feedback of the students and faculty on the integrated teaching. However in the present study a positive feedback was obtained from the students, who insisted that IT should be a part of the teaching curriculum. This was in general agreement with Studies by Kate et al who showed that this teaching–learning method was welcomed with great enthusiasm both by students and faculty (Kate et al, 2010). The present study also stresses on sensitizing the faculty for effective implementation of the curriculum.

The Medical Council of India (MCI) currently stresses on the need based curriculum to create interest among the students (Dandannavar, 2010). In order to meet this end, the MCI in its amendment 2012 has recommended the integrated teaching method and also strives to make it a part of regular curriculum (Jamkar et al). The same has been efficaciously practiced in our institution.

Case presentations: In problem-based learning (PBL) courses, students work with classmates to solve complex and authentic problems that help develop content knowledge as well as problem-solving, reasoning, communication, and self-assessment skills. These problems also help to maintain student interest in course material because students realize that they are learning the skills needed to be successful in the field. Case presentation, as practiced in our department is a novel form of PBL. Overall, PBL is an effective method for improving students' problem-solving skills. Students will make strong connections between concepts when they learn facts and skills by actively working with information rather than by passively receiving information (Gallagher, 1997; Resnick & Klopfer, 1989). Although active learning requires additional work on the part of students and faculty, Kingsland observed that students find PBL courses satisfying (Kingsland, 1996). However in the present study the students stated that although PBL s are useful, they should not be conducted close to their examinations as it involves a lot of additional work and time and thus may affect their performance in examinations.

Guest lectures by clinical faculty: Yet another innovative method introduced in the IT program exposed the students to clinical scenarios well in advance during their pre-clinical course of study. This was incorporated in order to make the students understand the importance of the pre-clinical subjects in their clinical career. The topics were chosen in such a way that they are correlated to the particular preclinical topic which is been taught. This enticed the students to study the pre-clinical subjects with greater interest which was confirmed by their feedback.

Video demonstrations: Dissection class is a must and an integral part of the anatomy teaching curriculum. In our institution, in addition to the conventional dissection classes, students are allowed to revise using the dissected specimens. Revision classes in the form of video demonstrations are also regularly practiced. This method of learning is unique and is seldom practiced in majority of the medical institutions. Feedback revealed that video demonstrations deepened their understanding of anatomical structures, provided them with a three-dimensional perspective of structures and helped them recall what they learnt and therefore should be frequently practised in the curriculum. Authors in the past have suggested the incorporation of routine dissection in an integrated problem-based learning medical course, stating its benefits (Azer & Eizenberg, 2007). The present study agrees with the same. This was ascertained by positive feedback from the students and progressive examination results

Conclusion

IT is an advanced method to strengthen the teaching-learning process and has had a positive response from the student population. Integration between preclinical and clinical subjects plays a crucial role not only in learning experience but also for better problem solving in clinical practice. The present study analyzes the positive effects of IT and also forms a baseline upon which an integrated and clinically oriented assessment pattern could be implemented in the curriculum. IT can be enhanced by including case presentations by students, lectures by clinical faculty followed by discussion and video demonstrations of dissected specimens which is effectively being followed in our institution.

References

- Azer, S.A. & Eizenberg, N. (2007). Do we need dissection in an integrated problem-based learning medical course? Perceptions of first- and second-year students. *Surg Radiol Anat*, 29(2),173-180.
- Beane, J.A. (1997). *Curriculum integration: Designing the core of democratic education*. New York: Teachers College Press.
- Damegh, S.A. (2005). Comparison of an integrated problem based learning curriculum with the traditional discipline based curriculum in KSA. *J Coll Phys Surg Pak*, 15,605-608.
- Dandannavar, V.S. (2010). Effect of Integrated teaching versus conventional lecturing on MBBS phase1 students. *Resent research in science and technology*, 2(11),40-48.
- Doraisamy, R. & Radhakrishnan, S. (2013). The Effectiveness of Integrated Teaching over Traditional teaching among first year MBBS Students: A Preliminary study. *Medical Journal of D Y Patil University*, 6(2),139-140.
- Gallagher, S.A. (1997). Problem-based learning: Where did it come from, what does it do, and where is it going? *Journal for the Education of the Gifted*, 20 (4),332-362.
- Ghosh, S. & Pandya, H. V. (2008). Implementation of Integrated learning program in neurosciences during first year of traditional medical course perception of students and faculty. *BMC Med Edu*, 8: 44.
- Harden, R.M. Sowden, S. Dunn, W.R. (1984). Educational strategies in curriculum development: The SPICES model. *Med Educ*, 18(4), 284-297.
- Huber, M.T. & Hutchings, P. (2004). Integrated learning: Mapping the terrain. The Academy in transition. *Washington DC: Association of American Colleges and Universities*, pp 1-17.
- Irby, D.M. & Wilkerson, L. (2003). Educational innovations in academic medicine and environmental trends. *J Gen Intern Med*,18,370-376.
- Jamkar, A.V. Yemul, V.L. Singh, G. Integrated teaching program with student centered case base learning for undergraduates at BJ Medical College Pune. Available from: www.faimer.org/education/fellows/abstracts/04jamkar.pdf.
- Kasselbaum, D.E. (1989). Change in medical education: the courage and will to be different. *Acad Med*, 64,446-447.
- Kate, M.S. Kulkarni, U.J. Supe, A. Deshmukh, Y.A. (2010). Introducing Integrated Teaching in Undergraduate Medical Curriculum. *Intl J Pharma Sci Res*, 1,18-22.
- Kingsland, A. J. (1996), "Time expenditure, workload, and student satisfaction in problem based learning." In L. Wilkerson & W. H. Gijsselaers (Eds.), *Bringing problem-based learning to higher education: Theory and practice*. San Francisco: Jossey-Bass, pp. 73-81.

Lemos, A.R. Sandars, J.E. Alves, P. Costa, M.J. (2014). The evaluation of student-centredness of teaching and learning: a new mixed-methods approach. *Int J Med Educ*, 5,157-164

Paul, V.K. (1993). Innovative programmes of Medical Education: Case studies. *Indian J Pediatr*, 60,759- 768.

Resnick, L.B. & Klopfer, L.E. (1989). “Toward the thinking curriculum.” In L. B. Resnick & L. E. Klopfer (Eds.), *Toward the thinking curriculum: Current cognitive research. Yearbook of the Association for Supervision and Curriculum Development*. Alexandria, VA: ASCD, pp. 1-18.

Schmidt, H.G. Machiels-Bongaerts, M. Hermans, H. Ten Cate, T.J. Venekamp, R. Boshuizen, H.P. (1996). The development of diagnostic competence: Comparison of a problem based, an integrated and a conventional medical curriculum. *Acad Med*, 71, 658-64.

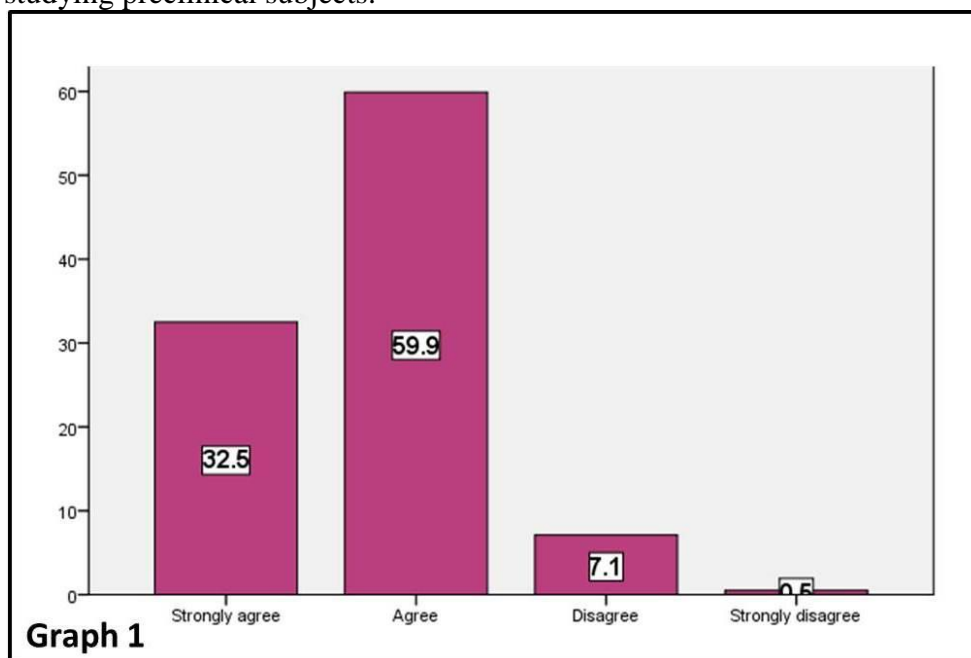
Shimura, T.T. Aramaki, K. Shimizu, T. Miyashita, K. Adachi, A. Teramoto. (2004). Implementation of integrated medical curriculum in Japanese medical schools. *J Nippon Med Sch*, 71, 11-16.

Singh, T. Gupta, P. Singh, D. (2013). Integrated teaching. In, *Indian academy of Pediatrics Principles of Medical Education* (4th ed). New Delhi: Jaypee Publishers, pp 22-26

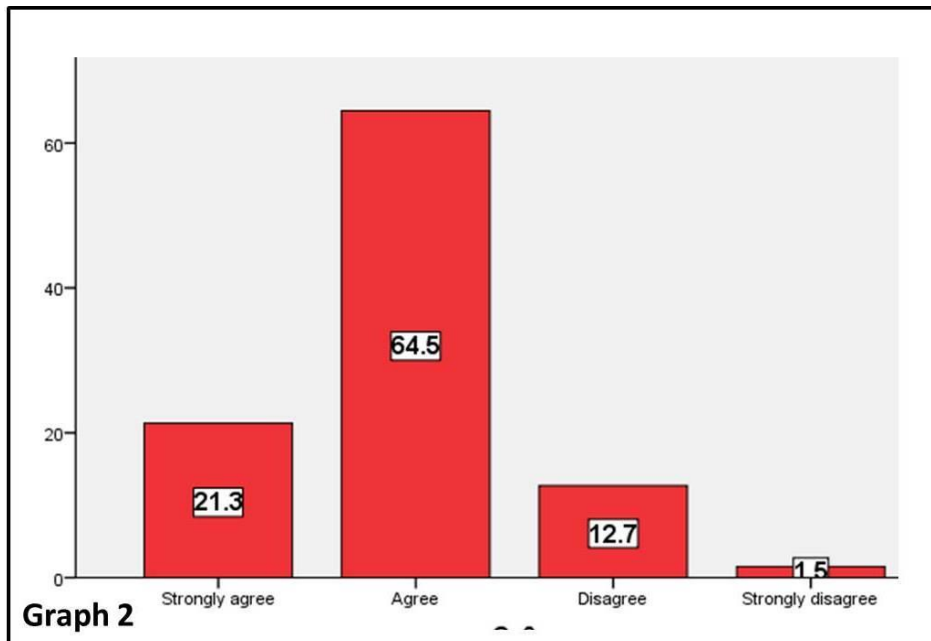
The Edinburgh Declaration,1988. World congress on the Medical Education of the world Federation of Medical Education. *Med Edu*, 22, 481-482.

APPENDIX

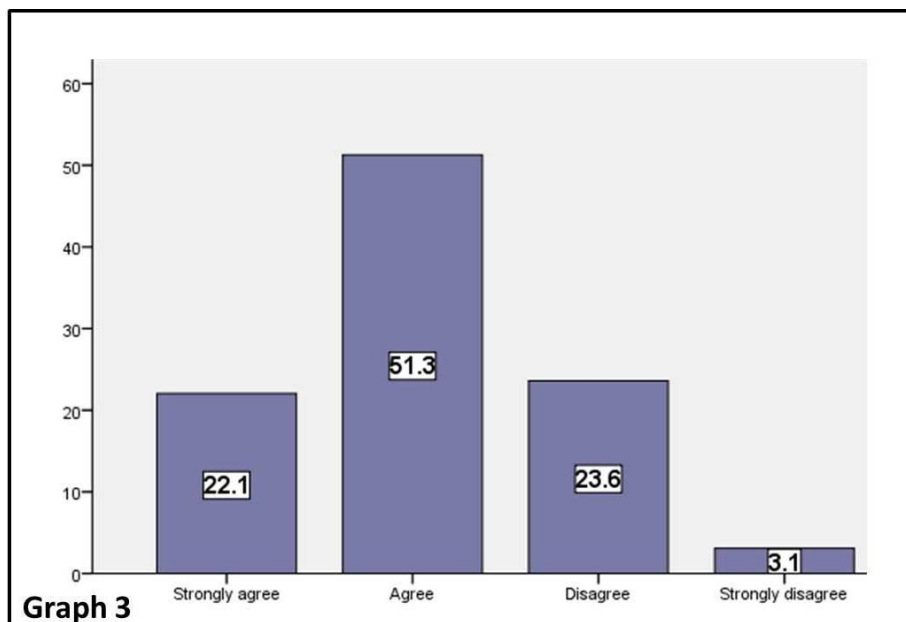
Graph 1: Integrated teaching (IT) gives confidence in approaching clinical cases & evoked interest in studying preclinical subjects.



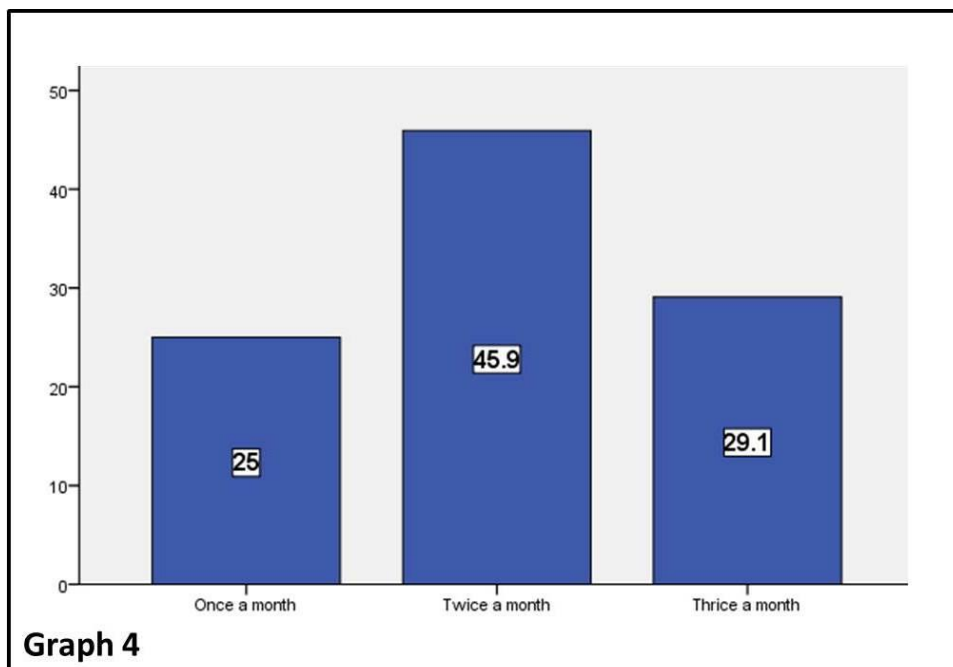
Graph 2: Integrated teaching (IT) helps to bridge the connection between academic knowledge and practical.



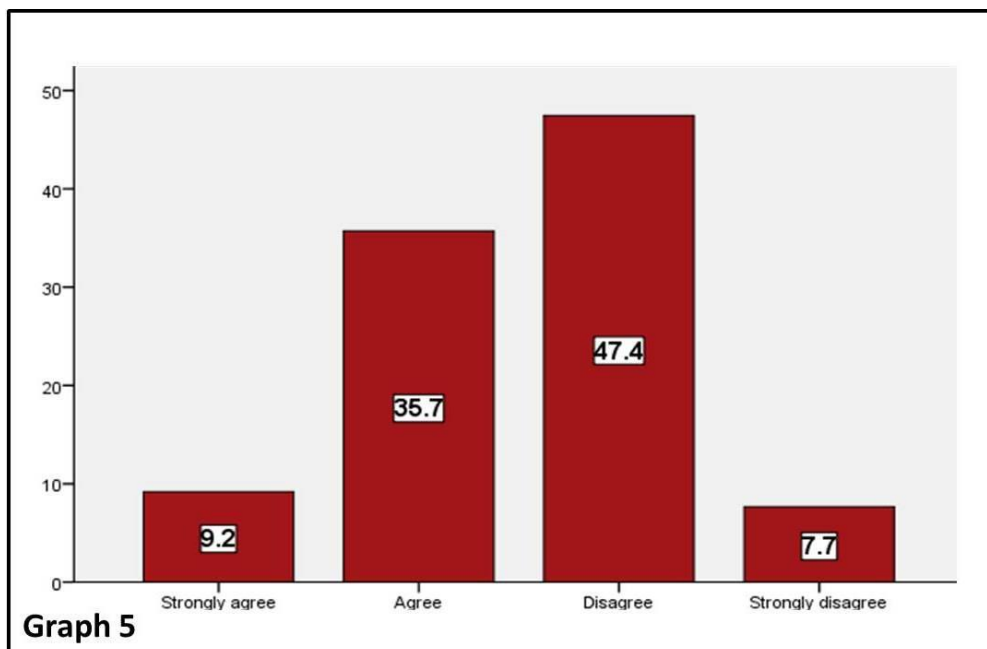
Graph 3: Integrated teaching (IT) is better than didactic lectures.



Graph 4: Integrated teaching (IT) should be conducted twice a month or more.



Graph 5: Integrated teaching (IT) helps in preparing for exams.



Graph 6: Implementation of Integrated teaching (IT) in preclinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum.

