

# Impact of integrated teaching on undergraduate medical students – A cross-sectional study

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**Received:** 12-04-2020**Accepted:** 06-06-2020**How to cite this article:**

Seth S. Impact of integrated teaching on undergraduate medical students – A cross-sectional study. Int J Adv Integ Med Sci 2020;5(4):96-99.

**Source of Support:** Nil,**Conflicts of Interest:** None declared.

**Aim:** The aim of this study was to study the impact of integrated teaching on undergraduate medical students. **Background:** The most common method of teaching medical sciences is teaching subjects in isolation through didactic lectures. Different unrelated topics being taught simultaneously produces no coherence. Horizontal integration which aims to unify subject topics of the same semester and vertical integration which additionally co relates subject topics with branches taught in different semesters is a way of bridging this gap to improve knowledge and skills of the students. **Material and Methods:** This cross-sectional study was carried out on 58, 2<sup>nd</sup> semester MBBS students. Students underwent a pre-test on topics of Head and Neck in Anatomy following traditional didactic lectures. They were then subject to a similar post-test following integrated teaching with surgery on the same subject. **Results:** There was an increase in the mean marks from  $52.93 \pm 14.02$  to  $54.47 \pm 19.53$  which was not significant ( $P = 0.452$ ). On a five point Likert scale, however, majority of the students strongly agreed that integrated teaching improved understanding of the topic, stimulated self-reading, and gave relevance to the topic being taught. They also requested that this be made a regular feature of their classes. Most of the faculty of anatomy also strongly supported the concept of integrated teaching rating it high on the Likert scale. **Conclusion:** Integrated teaching will play a great role in producing knowledgeable doctors equipped with the necessary skills and attitudes to render efficient health care where it matters.

**KEY WORDS:** Integrated teaching, Likert scale, undergraduate students

## INTRODUCTION

Effective teaching is defined as “one that produces demonstrable results in terms of cognitive and affective development of the students.”<sup>[1]</sup> When we bring together teaching material taught in separate academic courses or departments to give a complete picture of the subject, it is referred to as integration of teaching.<sup>[2]</sup>

The most common method of teaching in the country is through didactic lectures in a particular subject.<sup>[3]</sup> Most subject topics are taught in isolation. This method of teaching apart from being time-consuming provides little retention of the subject matter for students who have no realization of the clinical implications of the same.<sup>[4]</sup> Passive delivery of knowledge as in didactic lectures only encourages superficial learning as it is a teacher centered approach.<sup>[5]</sup> Different subject topics being taught simultaneously adds to the confusion.

Integrated teaching serves to bridge the gap between academic knowledge and practicals<sup>[6]</sup> and also helps in attainment of knowledge, skills, and attitudes. This, in turn, enables the students to relate to clinical data and findings taught in clinical subjects. It helps students understand the subject in depth, creates curiosity and interest, ultimately leading to internal motivation of the students to learn. Students who

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attend integrated lectures have increased effectiveness of their learning and memory.<sup>[7]</sup>

Problem-based learning is a unique form of the study aimed at self-learning and focuses on clinical practice skills. It helps in interpreting medical problems and aims to develop lifelong skills to solve practical problems rather than limiting learning to theoretical knowledge.<sup>[8]</sup> Case-based learning and early clinical exposure are other forms of vertical integration which can make learning more meaningful.

Faculty from different departments need to sit together to formulate a meaningful, coordinated interdepartmental curriculum if integrated teaching has to be made effective and student centric.<sup>[9]</sup> Thus, integrated teaching can enhance teacher – student and teacher – teacher interactions, reduce redundant content, and integrate disciplines.<sup>[10]</sup>

**MATERIALS AND METHODS**

**Study Design**

This was a cross-sectional study.

**Study Settings**

This study was carried out at Rohilkhand Medical College and Hospital, Bareilly after obtaining due permission of the Institutional Ethical Committee.

**Study Participants**

2<sup>nd</sup> semester M.B.B.S. students.

**Sample Size**

58, 2<sup>nd</sup> semester MBBS students who consented for the study.

**Methodology**

All the students underwent didactic anatomy lectures on topics on the head and neck region. They were assessed in a pre-test, using structured essay questions, short answer questions, multiple choice questions, and objective structured clinical examination.

Teachers who participated in the study had comparable experience of teaching students. Topics for integrated teaching were selected after meetings held by the designated faculty from the departments of surgery and anatomy. They formulated learning objectives and different teaching – learning methodologies for active participation of students. These lessons on topics in the region of the head and neck were integrated vertically in their routine schedule. At the end of the topics, the students were tested through similar examination tools as were used in the pre-test.

The gain in the mean marks between the pre and post-test was calculated and compared. Feedback from the students and faculty of anatomy regarding their preference for integrated lectures as

compared to didactic lectures was noted through feedback forms and analyzed on a five point Likert scale.

**Statistical Analysis**

The student’s paired *t*-test was employed to compare the mean marks of the pre- and post-test. The data were analyzed using the SPSS version 22.0 and *P* < 0.05 were considered as significant.

**RESULTS**

The pre- and post-test scores expressed as Mean ± SD were 52.93 ± 14.02 and 54.47 ± 19.53, respectively [Figure 1], and the difference was statistically not significant (*P* = 0.452; *P* > 0.05).

On a five point Likert scale, majority of the students agreed or strongly agreed that integrated teaching improved understanding of the topic, stimulated self-reading, and gave relevance to the topic being taught [Figure 2].

Most of the faculty of anatomy also agreed or strongly agreed that integrated teaching improved understanding of the topic

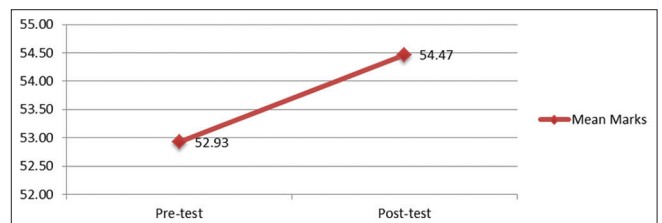


Figure 1: Mean marks of pre- and post-test scores (Total marks–100)

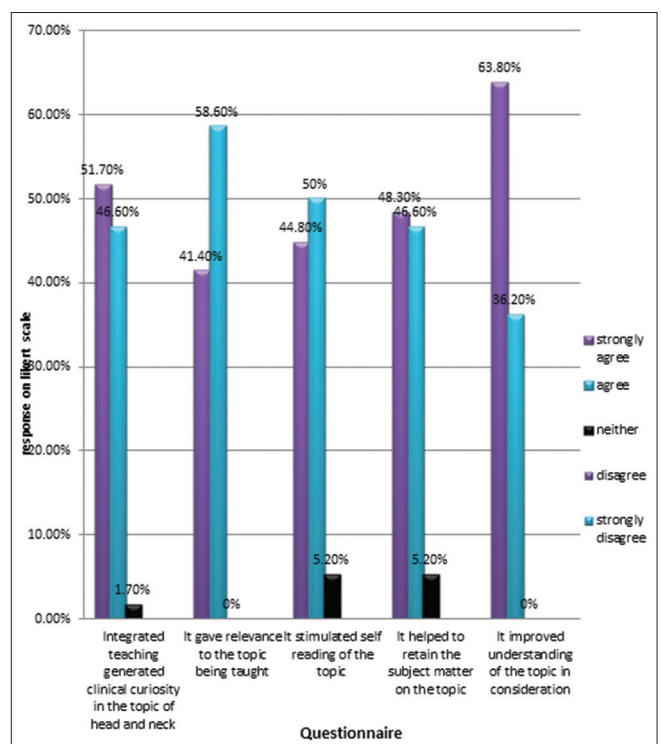
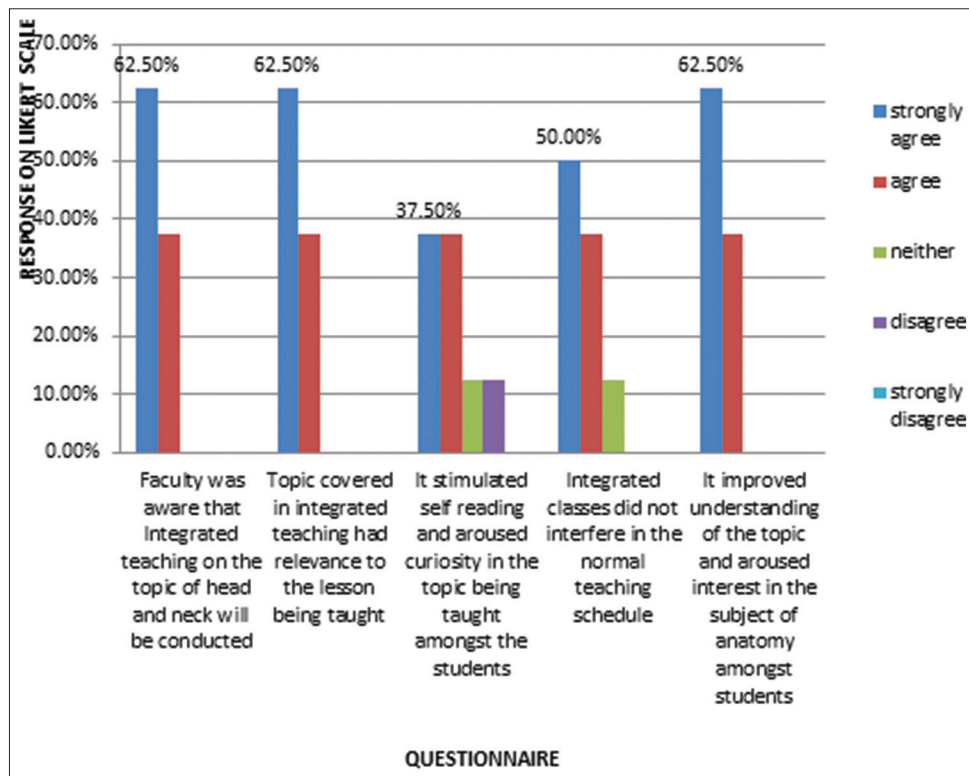


Figure 2: Student perception of integrated teaching



**Figure 3:** Faculty perception of integrated teaching

and aroused interest among students on the topic being taught without disrupting their normal teaching schedule [Figure 3].

## DISCUSSION

Harden described an integration ladder, in which he suggested that integration actually involves the eleven steps of isolation, awareness, harmonization, nesting, temporal coordination, sharing, correlation, complementary, multi-disciplinary, interdisciplinary, and transdisciplinary approaches around which the students focus their learning to integrate their knowledge.<sup>[9]</sup>

Three other models for integration have been defined:

1. Horizontal integration – which means combining subject matter in the same year courses such as anatomy, physiology, and biochemistry.
2. Vertical integration – combining basic and clinical sciences on a particular topic, simply put it is clinical case based learning.
3. Spiral integration – which is a combination of both horizontal and vertical integration.<sup>[8]</sup>

In our study, there was an increase in the post-test scores of students who underwent integrated teaching though this was statistically not significant. Kate MS *et al.*<sup>[5]</sup> and Kanwar *et al.*<sup>[11]</sup> found significant increase in post-test marks following integrated teaching.

Importantly, however, majority of the students agreed that integrated teaching generated clinical curiosity in the topics being taught. It gave clinical relevance stimulating self-study and improved understanding of the topics being taught. This

was considerably more as compared to didactic lectures alone so much so that many of them requested that such classes be made a regular feature of their curriculum. This is similar to a study conducted by Islam and Schweiger on the students' perception of an integrated approach to teaching, in which majority of students perceived integration as a far more superior method of teaching.<sup>[12]</sup>

Integration promotes meaningful learning. This simply means that students will only spend their time on a subject if they understand its relevance.<sup>[13]</sup> Basic sciences are therefore best learnt by students who understand their clinical applications through case-based studies early in their curriculum.<sup>[14]</sup>

In our study, faculty perception toward integrated teaching was very high on a five point Likert scale. The faculty considered that the topics covered in integrated teaching had relevance. Integrated classes did not interfere with the normal teaching schedule. It gave clinical relevance to topics being taught in anatomy. Kalpana found similar results in their study on Students and Faculty Perception on Integrated Teaching in MBBS Phase I,<sup>[15]</sup> reinforcing the importance of integrated teaching in the medical curricula.

## CONCLUSION

Health care should evolve to the needs of the country. As of today due to changing demography and environment, the spectrum of diseases has changed. Improved technology has changed the way of diagnosing and treating diseases. Patients expectations have also changed and competency-based medical education is the only road ahead to keep up with these changes.

Integrated teaching promotes retention and recall of knowledge. It is responsible for deep and meaningful learning. Integrated, competency-based medical education will play a great role in producing knowledgeable doctors equipped with the necessary skills and attitudes to render efficient health care where it matters.

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