

# Student's Perception About Integrated Teaching In An Undergraduate Medical Curriculum.

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## ABSTRACT

**The objective** of this study was to analyze the results of a survey on students regarding the integration of their institution's health science curriculum.

**Methods:** One hundred and twenty five (125) students of the 5th term of the undergraduate medical course were given a questionnaire on the integration sessions. The questionnaire with a five point Likert scale, with a minimum of one and a maximum of five rating, was administered in October 2009.

The data from the questionnaire was compiled and analyzed by using the SPSS version 16.

**Results:** One hundred and twenty two students out of the one hundred and twenty five answered the questionnaire 122/125 (97.6%). The reliability of the scale was 0.50 (Cronbachs alpha -0.5). 91.8% students agreed that integrated teaching helped in

the appreciation and application of the basic science knowledge to health and disease. 82% agreed that integrated teaching improved the performance in clinics and university examinations. The responses were equally distributed in favour of traditional teaching (36%) and integrated teaching (30.3%), while 33.6% responses were of indecisive. 51.7% of the students preferred the horizontal to vertical integrated teaching.

Many positive aspects were listed by the students, such as "integrated teaching improves the understanding of the topics" and a few negative remarks such as "lengthy" were mentioned. The students suggested mind mapping, concept maps and small group discussions to improve the interaction.

**Conclusion:** The students recognized that integrating the medical subjects was useful and of interest to them, and that they should be continued.

**Key Words:** Integrated teaching, vertical integration, horizontal integrations

## INTRODUCTION

There is a famous saying that, 'Knowledge that is learnt in isolation is rapidly forgotten'. The dictionary meaning of integration is "to make entire". Integration is defined as the organization of teaching matter to interrelate or unify the subjects which are frequently taught in separate academic courses or departments.[1]

The medical colleges in India have been following a traditional curriculum which was characterized by a discipline wise model "with a high degree of compartmentalization into the subject of basic sciences and the para clinical and the clinical branches". Several areas of redundancy, repetition and overlapping, along with the observation of a gap between the qualitative and quantitative advancement in medical education and achievements in the field of health care prompted the Medical Council of India to adopt a need based curriculum for undergraduate medical education in India. Regulation on undergraduate medical education, 1997" recommends a teaching approach which is characterized by maximal efforts to encourage integrated teaching between the traditional subject areas by using a problem based learning approach and to de-emphasize the compartmentalization of the disciplines, so as to achieve both the horizontal and vertical integration in the different phases.[2]

Integrated teaching was introduced in the M.S.Ramaiah Medical College, Bangalore, in year 2004-2005. The aim of this study was to analyze the perception of the students. The students were queried regarding their attitudes towards integration, in order to expose the barriers to integration and to identify a potential new mechanism for facilitating the implementation of the integrated curricula.

## MATERIALS AND METHODS

**Framing a time table-** A curriculum committee was formed by the heads of the paraclinical departments, namely pathology, microbiology, forensic medicine and pharmacology. A series of meetings were held, wherein particular topics of interest as per the curriculum were selected, such as tuberculosis, rheumatic heart disease and myocardial infarction. The departmental heads then assigned the topic to their faculty for preparation. The staff who were assigned from various departments for a particular topic, had a meeting and formulated the learning objectives and various teaching learning methodologies to ensure an active participation from the students and also to improve their analytical and clinical reasoning skills. The teaching learning methods which were incorporated were case simulated interactive lectures. This approach which was employed was large group lectures with a patient problem which was accompanied by questions. This ensured an active participation from the students and improved their reasoning ability.

**Student feedback** –After the completion of the module, the feedback was collected on the last day by using a questionnaire. The questions were framed, keeping in mind the utility of the integration, the understanding, appreciation and the application of the para clinical knowledge to the health and disease questionnaire. It consisted of a five point Likert scale and open ended questions about the positive and negative aspects and the student's suggestions to improve the integrated teaching. It was administered in October 2009.

## RESULTS

Overall response rate was 97.6% (122/125). The Cronbach's alpha was 0.50. SPSS II for windows was used for the analysis of the data results. The average student ratings across the items varied between 2.9 to 4.27. [Table/Fig 1] 54.1% (66/122) of the students agreed and 37.7% (45/122) students strongly agreed that it helps in the appreciation and application of the basic science knowledge to health and disease.

49/122 (40.2%) agreed and 50/122 (41.8%) agreed that it improves the performance in the clinics and the university examinations. The responses were equally distributed in favour of traditional teaching 43/122 (36%) and integrated teaching 37/122(30.3%), while 41/122(33.6%) responses were of indecision [Table/Fig 2]. The students felt that the topics which were discussed during the integrated sessions were relevant and that the discussions were satisfactory. When asked about their opinion on whether there was adequate interaction between the students and the faculty during the integrated seminars, 77.9% (95/122) of the students agreed that there was an interaction.

The students felt that a positive aspect of integrated teaching was that it enhanced the student's understanding of the diseases and helped them to correlate the para clinical and the clinical subjects. [Table/Fig 3]

The negative aspects which were stated, were that the sessions were lengthy and time consuming and that this cut down the time for the self study.[Table/Fig 3]

The alternate methods of teaching which were suggested by the students included group discussions, seminars and concept maps for better learning. [Table/Fig 4]

The students suggested that integrated teaching should be conducted more often, by including more topics. The students were enthusiastic about the idea of extending the integrated teaching to all the important topics. [Table/Fig 5]

## DISCUSSION

Medical education is changing rapidly, with more than half of the American schools being engaged in curricular reforms. Many of these modifications focus on implementing horizontal or vertical curricular integration. Horizontal integration blends either the related basic science disciplines in order to enhance the student's understanding of the body systems, or the related clinical science disciplines through interdisciplinary clerkships. [3]

In the present study, integrated teaching was perceived to be useful by a majority of the students with regards to an improvement in the appreciation and application of basic science knowledge. A similar finding was noted by Vyas et al. [4] Our students felt that their exposure to a case based discussion improved their performance in the clinics and university exams. Other studies have documented this observation. [4]

In general, the students used positive statements to respond to open ended questions which solicited their opinions and suggestions about integrated teaching. The student's suggestions on mind mapping and concept maps and that more integrated teaching classes to be taken regularly, will be incorporated in the subsequent integrated teaching sessions. These findings were noted in a study by Musal et al. [5]

For an integrated curriculum to succeed, these different perspectives from students as well as the faculty should be given a voice, as

Questions	N		
		mean	Std.dev
1. Integrated Teaching helps in appreciation and application of basic science knowledge in health and disease.	122	4.2787	.67128
2. Integrated teaching improves the performance in clinics and university exams.	122	4.1967	.83951
3. I prefer traditional teaching to integrated teaching.	122	2.9344	1.08892
4. I prefer * Horizontal integration teaching more than * Vertical integrated teaching.	122	3.2869	1.20933
5. the topics discussed during integrated sessions were relevant.	122	4.3115	.68130
6. The discussion on a given topic was adequate in integrated teaching	122	3.8361	.84658
7. There was a actual integration of the given topics	122	3.9836	.80272
8. There was interaction between student and faculty during the Integrated teaching program.	122	3.9180	.81909

[Table/Fig-1]: Average student ratings.

Questions	Disagree +SD	Undecided	Agree + SA
1.Integrated Teaching helps in appreciation and application of basic science knowledge in health and disease.	0.8	7.4	91.8
2. Integrated teaching improves the performance in clinics and university exams.	3.4	14.8	82
3. I prefer traditional teaching to integrated teaching.	36	33.6	30.3
4. I prefer * Horizontal integration teaching more than * Vertical integrated teaching.	30.3	18.0	51.7
5. The topics discussed during integrated sessions were relevant.	1.6	4.9	93.5
6. The discussion on a given topic was adequate in integrated teaching.	10.7	13.1	80.3
7. There was a actual integration of the given topics.	6.6	13.1	80.3
8. There was interaction between student and faculty during the Integrated teaching program.	.8	5.7	77.9

[Table/Fig-2]: Responses pertaining to concepts of IT expressed in percentage (SD-strongly disagree, SA-strongly agree).

POSITIVE ASPECT n-96	NEGATIVE ASPECT (n-20)
Improves the understanding of the topics/diseases (23/96)	
Correlates Paraclinical with clinical subjects (22/96)	Preclinical subjects were not involved in II nd year (1/20)
Helpful in improving clinical skills (10/96)	
Orients to clinical scenario (7/96)	A few topics were not covered in theory (2/20)
Improves academic performance (6/96)	

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POSITIVE ASPECT n-96	NEGATIVE ASPECT (n-20)
Improves the application of knowledge (4/96)	Helps only a small group of student(1/20)
Develops logical thinking (4/96)	
Creates interest in subjects (4/96)	No true interest from both students as well as staff. (1/20)
Boosts the confidence & speaking skills (3/96)	Boring (1/20)
Broaden the horizon about the medical applications in various situations (2/96)	
Provides extra information (2/96)	IT concepts on weekends (Saturday) (3/20)
Interaction & Participation by all (2/96)	Inadequate interaction(2/20)
Motivates the students to study (2/96)	Students refer to books while answering (1/20)
Relevant & practical (1/96)	Strict about attendance (1/20)
Good concept (1/96)	
Easy approachability (1/96)	Lengthy at times (5/20)
Group discussion (1/96)	Little response from the students(1/20)
Revision of topics covered in theory & practical class (1/96)	Time consuming cuts down the time of self study(1/20)

**[Table/Fig-3]:** Responses pertaining to negative and positive perceptions towards IT

1.	Black Board teaching – 5/21
2.	Vertical Teaching - 4/21
3.	Horizontal integration – 1/21
4.	Viva sessions – 1/21
5.	Flow chart presentation –1/21
6.	Mind mapping – 1/21
7.	Out of class room Gurukul – 2/21
8.	Seminars – 1/21
9.	Group discussion –1/21
10.	Interactive sessions –1/21
11.	Paper presentations –1/21
12.	Traditional method –1/21

**[Table/Fig-4]:** Other methods of teaching suggested by students

1.	Increase the number of IT topics & classes - 7
2.	It should be conducted more often. - 5
3.	First topics should be covered in theory topics –3
4.	Topics should be displayed well in advance & a proper schedule should be put up –4
5.	Exam related topics should be discussed- 3
6.	Should be conducted in all the terms of MBBS –3
7.	IT should not be done during exam preparation time – 2s
8.	Group discussion will be more beneficial – 3
9.	Should be covered for all important topics –2
10.	Tests, Vivas, Seminars should be conducted after each session of IT –1
11.	Topics of IT should be given as seminars for students and other students should ask questions – 1

Contd....

12.	Discontinue the IT –1
13.	Students do not know from where to get questions –1.
14.	Students should be oriented to the importance of IT teaching – 1
15.	Students should present the topics as they can be connected at a more basic than the teacher – 1
16.	Representative faculty of each department should come on the dias and discuss point by point –1
17.	Should be conducted in all terms of MBBS –1
18.	Compulsory for all subjects –1
19.	Should make lectures more interesting –1.
20.	Every student should be given a chance to present.-1
21.	Every week IT must be conducted.-1.
22.	Conduct regularly –1
23.	Every month it should be conducted. -1

**[Table/Fig-5]:** Suggestions to improve IT

**A 52yrs old female presented with history of continuous, retrosternal, constricting chest pain for 5min. The pain radiated to the left axilla left shoulder, back and neck. Past history – The patient is a known case of hypertension and diabetes mellitus since 10yrs.She succumbs to ventricular fibrillations and died .A clinical autopsy was performed.**

Questions
1. What are the causes of death in a case of myocardial infarction?
2. Enumerate non atherosclerotic causes of myocardial infarction.
3. List the relevant investigations to support the diagnosis.
4. Discuss the management of myocardial infarction.
5. Discuss the autopsy findings in a case of myocardial infarction.

**[Table/Fig-6]:** Example of a case given to the students during integrated teaching sessions. Integrating departments-pathology, microbiology, pharmacology, forensic medicine

medical schools envision, plan and embark upon a redesign of their undergraduate education curricula.[6]

In a similar study which was done by Grkovic [7], the author has highlighted the efforts which were made to expose the medical students to the real research environment and the academic way of thinking, in order to create health professionals with an ongoing interest in medical research.

Vidic et al [8] have suggested that it is imperative for the success of the new curriculum, however, that certain criteria should be satisfied: To 1. Reorganize the basic science departments to determine the course ownership.2. Establish a reward system for the teaching faculty.3.Establish course objectives.

In a study which was done by Soudarssannae and Sahai [9] the integrated teaching of epidemiology and the incorporation of the presentation and discussion of the actual studies which were conducted in the local population with the involvement of the clinical departments, was a novel attempt in the lecture discussions of the subject. This method was well appreciated by their students.

Schmidt [10] reported that in his experience, integration was most successful when it occurred naturally as a part of the teaching and learning process, rather than that of the mandated course structure.

Kingsley et al [11] stated that curricular integration was one method for improving the teaching and learning of the complicated and

interrelated concepts, thus providing an opportunity to incorporate the research training and objectives into traditionally separate didactic courses.

## CONCLUSION

This study showed that it was possible to adopt integrated teaching under a conventional curriculum in spite of all the challenges. Thus, we can emphasize that considering the volume load which the students are subjected to, integrated teaching can definitely save their time and energy, and give them better insight into the subject. Our collective experience convinced us that designing an integrated curriculum was well worth the considerable efforts which were involved and that it would support the integration of the content into the minds of the learners. Implementing a well integrated curriculum requires strong leadership and overcoming departmental barriers.

Our experiences showed that it was difficult to formulate modules for integrated teaching and that the process required a thorough planning by faculty who were committed, who were genuinely interested in conducting these sessions. The faculty should be successful in creating sufficient interest among the students, so as to ensure maximum student participation.

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