

# Designing and evaluation of Vertical integrated teaching program in 1<sup>st</sup> year MBBS curriculum- Perception of students and faculty

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## Abstract

**Background:** An integrated medical curriculum refers to a non compartmentalized approach to basic sciences whereby lectures on subjects like anatomy, physiology biochemistry and medicine are organized around organ systems such as cardiovascular, respiratory or nervous with a major component of problem based learning. **Methodology:** This was a module of vertical integrated teaching program. Topic chosen was coronary circulation. Departments involved are Anatomy, Physiology, Biochemistry and Medicine study was conducted in 2 stages, stage I – didactic lectures by faculty members, stage II- topic presentation and case discussion by students. This was followed by open topic discussion. **Result:** Evaluation done from feedback of faculty and students. 93% of the students responded that teaching physiological concepts in integration with clinical scenarios is a better approach. 48% teachers think that this mode of teaching is time consuming. 96% Students gave a very positive feedback about the module. **Key Word:** Vertical integrated teaching program.

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## INTRODUCTION

Changing needs of the society advances in scientific knowledge and innovations in the educational field necessitate constant changes in medical school curricula. Various innovations and trends which have been undertaken globally include education for capability, community orientation in medical education, self-directed learning, problem-based learning, integration and early patient contact. An integrated medical curriculum refers to a non-compartmentalized approach to basic sciences whereby lectures on subjects like embryology, histology,

anatomy, physiology and pathology, are alternated over the course of first two years<sup>9</sup>, organized around organ systems such as cardiovascular or nervous with a major component of problem-based learning.

Integration is the organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments (Harden *et al* 1984) In the field of education, the term integration means coordination of the teaching learning activities to ensure harmonious functioning of the educational process. One of the major deficiencies in UG teaching is lack of holistic approach. The need for integration is also felt by the student, one of the main reasons is theoretical and fragmented manner in which they are taught.<sup>1</sup> Vertical integration is defined as the integration between the clinical and basic science sections of curriculum.<sup>2</sup> It has been found to stimulate profound rather than superficial learning and thereby results in better understanding of important biomedical principles. Vertical integration improves motivation, enhances deep learning, prepares for lifelong learning, facilitation, curricular reforms, enhances clinician's reflection on scientific practice and enhances scientist reflection on clinical application and

research.<sup>4</sup> Vertical integration brings more relevance and excitement in learning. To involve clinicians in preparation of basic medical science modules and vice versa is vital to develop Vertical integration.<sup>5</sup> Vertically integrated learning is the need of the hour. In recent years such curricula have been employed by faculties of many medical schools throughout the world.<sup>2, 3, 6, 7, 8</sup> The medical curriculum is vast and students are expected to learn many subjects at the same time. The teachers are also involved in a number of activities apart from teaching like research, administrative, updating their knowledge etc. In doing so, teaching undergraduate medical students frequently remains a separate academic department without integration to interrelate or unify subjects. Hence current medical education imparts knowledge in a disjointed manner and does not allow students to develop the skills to investigate, analyze and prepare to perceive the patient as a whole. Therefore, Medical Council of India desires the incorporation of integration in the medical curriculum in order to provide the students with a holistic rather than fragmented learning perspectives.<sup>10</sup> So our aim was to design and evaluate a vertically integrated teaching program in 1<sup>st</sup> year MBBS curriculum for few topics. The topic coronary circulation was selected for the present study. This was an effort to eliminate the sharp boundaries between basic and clinical sciences.

### AIM

To design, evaluate and to assess the feasibility of vertical integrated teaching program in 1<sup>st</sup> year MBBS curriculum for few topics.

### OBJECTIVES

1. Designing of a module for Coronary Circulation in basic science.
2. To assess the learning by vertical integrated teaching program in 1<sup>st</sup> year MBBS curriculum from feedback by students
3. To assess feasibility of vertical integrated teaching program for faculty from their feedback

### MATERIAL AND METHODS

The study was conducted at BVDUMC and H, Sangli, after taking the permission from IEC and informed consent from students and faculty members. Topic– Coronary Circulation– Anatomy, Physiology, Biochemistry, Applied aspect and Case discussion 150 students were included in the study.

**Framing A Timetable:** Faculty members from department of anatomy, physiology, Biochemistry and

medicine were involved in vertical integrated teaching program by their own consent. Series of meetings were conducted by these faculty members to decide the schedule. **Stage I** – Didactic lectures by faculty members of involved departments. **Stage II** – Topic discussion and case presentation by students followed by open topic discussion.

### Implementation of timetable

**Stage I** - Didactic lectures were conducted by the respective departments as per their prefixed timetable.

**Stage II** – 15 days prior to this stage II, 4 Groups of students were made, with each group of 4 students.

**Group I** – 1<sup>st</sup> student – presented Anatomy of coronary circulation

2<sup>nd</sup> student- presented Physiology of coronary circulation

3<sup>rd</sup> student – presented Biochemistry of coronary circulation

4<sup>th</sup> student- presented Applied aspect of coronary circulation

**Group II to Group IV** – did Case presentation- clinical scenarios covering most of the objectives related to the lectures on coronary circulation. 30 min were given to each group. There was open topic discussion by the involved faculty with the students to assess their understanding and solving their queries.

**Student's feedback:** After completion of module, strength and weaknesses of the program were evaluated by a feedback questionnaire. A 5 point Likert scale was used to assess behavioural changes in students with scores,

1. Strongly disagree
2. Disagree
3. Uncertain
4. Agree
5. Strongly Agree

**Faculty feedback:** The Questionnaire was designed by using a 5 point Likert scale to note their encountered problems, likes, dislikes, suggestions and level of satisfaction in execution and implementation of vertical integrated teaching program. The questionnaire includes free comment session for suggestions by the faculty members.

**Statistical analysis:** Positive and negative responses were evaluated from student and faculty feedback to find the acceptability and feasibility of the program by using a five point Likert type scale. Out of these 150 students, only 114 students attended the presentation. 4 feedbacks for assessment of module were not included due to incomplete form filling.

**Table 1:** Questionnaire to assess the behavioural changes in student

Sr no	Questions	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree	Total
1	I remember clinical Physiology and its clinical relevance	36	73	5	0	0	114
2	Partial recalling of the topic is sufficient to understand the associated clinical topic	22	69	10	12	1	114
3	This mode of teaching helped my critical thinking	43	69	2	0	0	114
4	Vertical integration motivated and improved performance in assessment	49	59	6	0	0	114
5	This module will be helpful in the future years for better perception of clinical concepts	65	47	2	0	0	114
6	such integrated sessions will make me more confident	56	57	1	0	0	114
7	integrated teaching has provoked me to change my method of study	46	52	16	2	0	114
8	This mode of integrated teaching has made me more curious to explore the topic in depth	51	56	7	0	0	114
9	During integrated teaching sessions I feel that relevant queries can be asked to teachers more freely	42	66	5	0	1	114
10	This integrated teaching module and assessment can be continued in future	57	52	5	0	0	114

**Table 2:** Questionnaire to assess the module

Questions	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
Module was well organized	41	63	6	0	0	110
Facilitator gave clear explanation and relevant information and encouraged critical thinking	40	60	9	1	0	110
Facilitators interacted with the students and encouraged their participation	42	65	3	0	0	110
Teaching Anatomical physiological and Biochemical concepts in integration with clinical scenarios is a better approach than traditional teaching	62	44	4	0	0	110
Integrated approach makes learning and understanding easy	64	45	1	0	0	110
Your present knowledge level after integrated teaching has improved	43	64	3	0	0	110
In this module there was a good balance between basic and clinical concepts	50	57	3	0	0	110

**Table 3:** Questionnaire To Assess The Feedback Of Faculty

Sr No	Question	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
1	The exercise of sequential teaching is burden	3	6	4	12	0	25
2	The basic of Anatomy, Physiology, Biochemistry and Medicine are usually revised before clinical session	8	14	0	3	0	25
3	Physiology is a conjoint subject for Medicine	12	13	0	0	0	25
4	Favourable behavioral changes are noticed in students	14	11	0	0	0	25
5	The students are now more inquisitive	9	15	1	0	0	25
6	Students queries are more relevant after this module	15	9	1	0	0	25
		<b>Limitation</b>					
7	This mode of teaching is time consuming	3	4	5	13		25

**Strengths**

8	Assessment of Physiological knowledge by the use of clinical scenario based questions is better way of judging the knowledge of the student	17	8	0	0	0	25
9	This integrated mode of teaching and assessment be continued in future	20	5	0	0	0	25

93% of the students responded that teaching physiological concepts in integration with clinical scenarios is a better approach than traditional teaching and 64% indicated that vertical integration makes learning and understanding easy. 96% Students gave a very positive feedback about the module. 89% teachers gave the positive feedback that this integrated mode of teaching and assessment be continued in future. 48% teachers think that this mode of teaching is time consuming.

**DISCUSSION**

The ideal basic objective of medical education in every country and institution is to educate the students regarding health, which includes physical, mental, social and possibly spiritual well-being. The most difficult task of proper training starts after the students are admitted. The pattern of this again varies from country to country and place to place in a country. Finally, the students are judged by examining them at every level whether they could deliver goods to the society and the country.<sup>11</sup> Both faculty and students appreciated the program to be a successful attempt in terms of understanding and appreciation of basic science knowledge in the context of health and disease through an integrated learning program incorporating diverse teaching learning methods. Similar results have been quoted by Brynhildsen J *et al*, feedback from their students and faculty showed that vertically integrated teaching methodology is better than the traditional teaching.<sup>2</sup> Abraham Flexner was also in a strong favour of correlating the knowledge of clinical and basic sciences because it make learning and understanding easy.<sup>3</sup> In a survey involving three teaching hospitals in Australia, the responding staff and faculty strongly support the integration of biomedical sciences into clinical teaching Alam S M *et al* indicated that an early clinical exposure, use of clinical scenarios and clinical examples in teaching sessions of basic medical sciences generates interest among the learners and help them to see why it is important to learn basic sciences.<sup>4</sup> The studies of Ghosh *et al* and Sathishkumar S also showed that the students liked the integrated and case stimulated teaching and agreed upon its continuation in future<sup>6,7</sup>

**CONCLUSION**

The study showed that it is possible to adopt an integrated learning module in the first year of medical teaching under a conventional curriculum. The faculty though not

having prior exposure to such a system also appraised the method as a useful one.

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