

Integrated Learning Program for Third Year Professional Students at a Medical School of India

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Abstract:


Introduction : Though, Medical Council of India had recommended introducing horizontal and vertical integration, an integrated approach to teaching medical subjects has not become popular in Medical Colleges in India. **Objective:** To develop, implement, and evaluate an Integrated Learning Program for the third-year professional students at a medical school in India. **Method:** The Integrated Learning Programme (ILP) was conducted for the first time in 2016 for a batch of 181 third year professional students of a Medical School in Western India. It was an integrated module employing correlation and vertical integration. It incorporated Interactive Lectures, Videos, Self-study, Clinical Visits and Home Visits. Student assessment was formative using pre and post Multiple Choice Questions (MCQs) test and case presentation through checklists to assess clinical skills and home visit skills. Evaluation of the programme was based on feedback from the students and faculty members and report prepared by the students. **Results:** The mean score of students in the knowledge domain assessed through Multiple Choice Questions (MCQs) for ILP on Iron Deficiency Anemia conducted at the end of the ILP was statistically significantly ($P=0.022$). The feedback from faculty members and students was positive, highlighting benefits of ILP as; integrated learning of the basic sciences, their application to clinical cases and active student learning. Few challenges were also identified like higher input required from faculty members. Most of the faculty members and students recommended that the integrated programme should be continued and extended to other parts of the curriculum. **Conclusion:** The study findings conclude that an integrated learning programme is beneficial and is likely to improve quality of health care provided to the patients. It is feasible within a conventional medical curriculum of an Indian Medical School.

Key words : Curriculum, Integrated Teaching, Medical Education, Teaching-Learning methods, Undergraduates

Introduction:

Integrated learning refers to when knowledge and skills from across the disciplines are called upon to address patient cases, problems and issues and also to create learning experiences for students.^[1-3] Integrated approach is responsive to students' needs and is more concerned about how well students are

prepared to assume future societal roles. The integrated curriculum is structured to foster relationships among learners, teachers and the content itself by which students acquire ability to perceive patient as a whole. The non-integrated approach on the other hand imparts knowledge in a disjointed manner which does not allow students to

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develop skills to investigate, analyze and become critical thinker.^[2-4]

The integrated approach to the teaching of topics in a course is well accepted as an effective educational strategy.^[5-8] Its introduction in the medical course has been advocated by Medical Council of UK^[9] and Medical Council of India.^[10] The Medical Council of India has recommended introducing horizontal and vertical integration for teaching undergraduate medical students as early as 1997 and then in the Vision 2015 document,^[11] in order to provide the students with a holistic rather than fragmented learning perspective. The SPICES model (Student-centered, Problem-based, Integrated, Community-based, Elective & Systematic) of educational strategies describes Integration as a continuum with complete integration on one end and traditional teaching on the other. Though, Medical Council of India had recommended introducing horizontal and vertical integration, an integrated approach to teaching medical subjects has not become popular in Medical Colleges in India.^[10] The GMR 2019,^[12] represents the first major revision to the medical curriculum since 1997, it lays emphasis on learning which is competency-based, integrated, acquisition of skills, ethical and humanistic values. At the study setting Integrated Learning Program (ILP) was part of Undergraduate (UG) teaching prior to 12 years of the study. There was a felt need to revive an effective integrated learning program. Also, to have an educational experience of implementation of the proposed recommendations of integration as mentioned in the Vision 2015,^[11] at the institute, the study was conducted with an objective to develop, implement and evaluate an Integrated Learning Program for the third-year professional students at a medical school in India.

Method:

An Integrated Learning Program was introduced for the first time for third year professional students when they had completed their

second-year exams at a medical school located in western part of India during November 2015 to July 2016. The school otherwise had a subject-based traditional curriculum. There were 181 students in the batch and all were exposed to the ILP.

Topic of Integrated Learning Program was "IRON DEFICIENCY ANAEMIA" (IDA) and type of Integration was Vertical Integration. Iron Deficiency Anemia is a highly prevalent nutritional deficiency disease that affects 65%-75% of women of child bearing age in India; a major public health problem in the country.

Correlation: Out of the 11 steps; Isolation, Awareness, Harmonization, Nesting, Temporal Co-ordination, Sharing, Correlation, Complementary, Multi-disciplinary, Inter- disciplinary and Trans-disciplinary as suggested by Harden RM,^[6,13,14] on the integration ladder, correlation was employed (Figure 1). In correlation, the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated session or course is introduced in addition to the subject-based teaching. Participating departments were; Physiology, Biochemistry, Pathology, Medicine, Surgery, Obstetrics Gynecology, Pediatrics and Preventive and Social Medicine (PSM).

Steps followed in the conduction of Integrated Learning Program were:

Step 1: Approval from the Institutional Ethics Committee;

Step 2: Formation of Core- Committee from participating departments;

Step 3: Orientation of the faculties; A total of 20 faculties attended this session & interested one (10) were short listed for faculty development program;

Step 4: Orientation of the students;

Step 5: Faculty development Program;

Step 6: Selection of appropriate cases/patients;

Step 7: Student allotment; There were 181 student participants. In order to effectively achieve the objectives of ILP program it was decided to allot ten students per case in the wards.

Design/development of the intervention: The duration of the program was of two weeks and teaching & learning methods employed were: Interactive Lectures, Videos, Self-study, Clinical Cases, Home Visits.

The ILP had three components;

1. Pretest; Pretest in form of MCQs was administered followed by integrated teaching that took place for three days; on the first day the importance of studying IDA was discussed. Topics related to basic sciences and pathology of anemia in general with emphasis on IDA were revised and reviewed. On the second day clinical aspect of anemia with emphasis upon IDA along with principles of management were discussed. And on the third day communication skills and prevention and control were discussed.
2. Ward/Clinical Visits: Clinical case exposure was for four days with a batch of 50 students each. They were posted in four clinical departments viz; Medicine, Obstetrics & Gynecology, Pediatrics and Surgery. One case per group of ten students was allotted, a total of 18 cases supported by a check list were prepared.
3. Home visit: Seven home visits with a batch of 25 students each, supported by a check list were planned and conducted.

Assessment: To assess knowledge a pre and post test was administered utilizing MCQs. Additional skills were assessed during clinical sessions through case presentation supported by checklist and assessment of home visits also through a checklist. It was an integrated assessment with inputs from all the participating faculties.

Evaluation: Feed back was obtained from students through a semi structured feedback tool, oral feedback by a few randomly selected students and reports prepared by them. Feedback from faculties

was obtained through a semi- structured feedback tool.

Analysis:

Quantitative: Paired t-test was applied to compare scores obtained in the MCQ test. Semi-quantitative data analysis was done using a five-point Likert scale, where; 1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent. The scores on the scale were expressed as frequency distributions.

Qualitative: Emerging themes were analyzed. MS excel sheet was used to enter and analyze data. For feedback, the tool was assessed manually and emerging themes were developed.

Results:

Out of the 181 students, 136 (70%) gave the pre-test paper though there was 90% attendance on the first day and 119 (66%) gave the post-test on the last day. There were 99 (54.7%) students who took both the tests. Reasons for non-participation in the program included; sports activity, illness, and repeat examinations. Forty faculties were oriented on the process of ILP from different departments and ten of them actually participated in teaching and training of ILP. Almost all faculties who participated were available for the entire duration of ILP.

Assessment:

Assessment of Knowledge(the content): In order to have an integrated assessment, a set of 20 MCQs prepared by faculties from different departments were administered before and after the program. The MCQs also included case history type questions (8) to test their analytic skills (higher intellectual skills) for integrated assessment. The mean score obtained by the students in the MCQ assessment was statistically significantly (t value = 2.33, df = 98, p = 0.022). Higher mean score was obtained by the students at post-test as compared to pre-test as shown in Table 1.

Integrated assessment of clinical sessions through case presentation & checklist; Eighteen cases supported by a check list were selected to be assessed by faculties. Out of which, ten were

Figure 1: Integration concepts framed in the GMR 2019 [14,6]

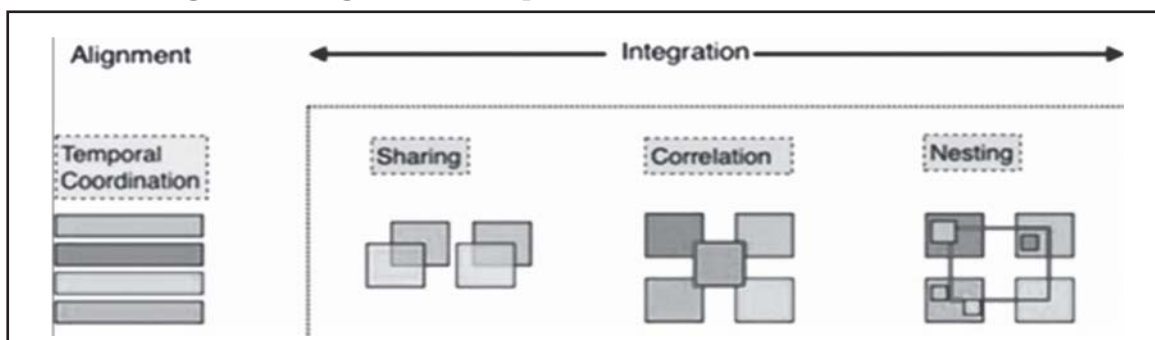


Table 1: Mean Score Obtained by the Students in the MCQ Assessment

	Pre-test	Post-test
Number of students	136	119
Mean Score	10.0074	10.6723
95% CI*	(5.98 - 14.02)	(5.47 - 15.87)
SD	2.0129	2.6009
Paired t-test (N=99)	t value = 2.33, df = 98, p = 0.022**	

*CI=Confidence Interval, ** Statistically significant (paired “t” test, p=0.022)

completed and returned by them. The major strengths as reported by the teachers were: The students' demonstrated good skills in history taking of complaints and personal history. However, they lacked interpersonal skills in communication; in terms of; making eye contact, use of medical jargons, proper explanation of examination, reassurance and checking understanding of the patient. Some of them failed to elicit clinical signs of anemia like checking of pallor, making a provisional diagnosis and eliciting treatment seeking behavior. All of them mentioned that the assessment needed to be conducted in some more organized manner.

Assessment of home visits through checklist; Seven home visits with a batch of 25 students each and supported by a check list were conducted. The visits were conducted at homes of patients who were admitted in the wards and discharged. Five visits were from slums and two were from nearby villages. They made a clinico-social diagnosis after assessment of the health status of the family. A quote from one of the students was “Home visit was conducted at patient's house. Our professors

accompanied us and taught us how knowledge about just few public health parameters helps us discover the route of the problem to correct it.” Another student said “Interactions with the patients in the hospital and community is all together a different and difficult task. At the home of a patient, i.e., in the community, we got to know the environment of patient's house, one of the epidemiological triangles.”

Evaluation of ILP:

A. Feedback from Faculty Members; Out of the ten faculties who participated in ILP, nine(90%) of them were available for giving written feedback on the last day. The different aspects of the feedback were as follows;

- **Facilitator Training Program:** Almost all rated the effectiveness of the Facilitator Training Program as good to excellent on a five-point Likert scale.

Major Strengths of the Facilitator training Program: Redundancy was eliminated. A good strength of faculty participated, leading to integration of faculties from different

departments on a common platform that enhanced coordination between them.

Recommendations: Higher inputs and interaction among faculty members and before implementation more meetings should be arranged.

- **Clinical Visits:** Three quarter of them rated the effectiveness of the Clinical Visits in introducing the students to history taking and physical examination of IDA, in helping students observe abnormal physical signs, introducing the students to the pathophysiology of symptoms and signs related to IDA and correlating these with derangements in physiology, biochemistry as good to excellent.

Strengths of Clinical Visits: There was good patient-student and student-teacher interaction. The checklist for observing student interacting with the patient by teacher and subsequent group feedback was good. Recommendations : Presence of all students to be made compulsory.

Checklists : Most of them mentioned that it was well prepared, structured and comprehensive and the same could be regularly used in routine ward posting. However, they also thought that Clinical visit should be scheduled in smaller groups, so that actual correction of student's mistake is possible.

- **Home Visits :** Cooperation from faculty and student, interaction with patient and relatives and direct observation of socio-environmental condition were major strengths.

Recommendation for improving the Home Visits: Proper communication with patient should be made before planning a visit and full address should be noted. Identification of suitable family and at least two-family visits should be conducted to elicit complete information of the family. The visits should be conducted in small batches comprising of not more than ten students.

Assessment: Majority (8/10) of them rated the

effectiveness of the Test (MCQ) in helping students learn the learning objectives drawn at the end of each session as good to excellent. Few suggested additions of some theory-based question and OSCE based assessment. A quote from a faculty "This also enhanced coordination between different departments. ILP gives integrated learning for particular topic and prevents repetition". Almost all members mentioned that they would recommend expanding the ILP to other systems, problems and with future batches. Other topics like Diabetes, Hypertension, HIV, Coronary Heart Diseases, Tuberculosis, Malaria, Cardio Vascular System and Respiratory System were suggested for inclusion. More faculties should be included in this programme was mentioned by most of them.

B. Feedback from students; ILP Content: It helped them to apply concepts taught from the basic medical sciences to understand clinical disease, developing skills in self-directed learning, in addressing the different learning styles of students learning through a variety of teaching learning methods used.

Teaching-Learning Methods: Home visits and discussions on the same, clinical case in the wards and discussions and assessment were rated good to excellent by two -third of them. Two-third students recommended that ILP as tool should be continued for and extended to other common health problems. Some of them gave reasons for the same as, it is easy to understand, ILP is knowledge improving programme, enhances students' awareness, better method of learning, more explanatory and holistic and could help to improve communication skills. One-fourth mentioned that this was a good experience. However, a fifth of them thought that it should not be continued and majority of them gave the reason that ILP is time consuming, a burden and boring.

Major strengths of the ILP: One-third students mentioned that case studying in the wards and home visits are the major strength of ILP. Few mentioned inter-active nature of sessions and good student

involvement. According to a tenth of them it involved student's integration of all subjects, clinical correlation and discussion. A few mentioned it led to motivation and was an enjoyable experience. Few suggestions from a fourth of the students were; to reduce lecture content and more time should be given for home visits and for health education to the patient; more emphasis to be given to more case studying, ward posting, picking interesting disease and proper management of the program with inclusion of more faculties.

Student's Quote while reviewing a report prepared by a group of students: "This entire program has helped us view medical science from a different perspective, enhanced our approach to learning, enucleated experience has enlightened the spirit of curiosity in us-to find a way to quench the thirst of knowledge. It was a wonderful experience to revise basic sciences and to integrate the same with clinical aspects and application."

Discussion:

Educational program has a better chance of being effective if its purpose is clearly expressed.^[15] One can give an analogy of functioning of human body, where no system functions in isolation but operates in an organized and interdependent manner to achieve optimum level of functioning.^[1,3] Medical teachers should present the vast amount of information to the students in a planned, organized and integrated manner.^[1,3] Students find the preclinical subjects drab and boring. One of the main reasons is the theoretical and fragmented manner,^[16] in which they are taught by each preclinical department at different times, without any awareness of what is taught by other departments. This disjointed approach to the topic leads to unnecessary repetition, loss of valuable time and also creates confusion in the student's mind. The current study found out that the mean score of students in the knowledge domain on the ILP was statistically significantly ($p=0.022$). A study by Muthu Kumar T et al,^[16] also utilized MCQ for assessment and found the

pre- and post-test scores to be statistically significant. Almost all of the faculty members rated the effectiveness of the ILP in helping students to integrate the knowledge of basic sciences in the context of the clinical cases. Occasional reports have been published on successful trial of integrated teaching in India based on the feedback received from the students^[3,8,9,17-24] Citing similar experiences. Studies by Gosh et al,^[17] and Shafi et al,^[18] concluded that the adoption of integrated module and the use of multiple teaching and learning methods had proven to be useful in acquisition of knowledge from the students' perspective; students and faculty expressed an overall satisfaction towards ILP. This study showed that it was possible to adopt integrated learning module in first year of medical course. Study carried out by Kate et al,^[3] reported findings very similar to this study. They have quoted that; the new teaching learning method of integrated teaching was found to be more effective and has been well accepted by faculty as well as students. Students showed better clinico-pathological correlation along with improvement in cognitive and psychomotor domains. A study carried out by Vyas et al,^[8] also found that the feedback from faculty and students was positive, which highlighted benefits such as integrated learning of basic sciences. Kalpana Kumari MK et al,^[24] have also mentioned in their article, that the students recognized that integrating the medical subjects was useful and of interest to them, and that it should be continued.

Conclusion :

An integrated learning programme was effective in enhancing knowledge, attitudes and motivation of learners The program is feasible within a conventional medical curriculum. Most of the faculties and students recommended program continuation and expansion to other parts of the curriculum by identifying topics which can be taught as ILP. The enthusiasm, hard work and integrated efforts by the faculty members who participated in the programme were extremely important for the success of this intervention.

Limitations:

Though there were challenges like: difficulties in arranging home visits in small groups; in spite of all efforts two-third students participated and some of the reasons for the same being- sports activity, illness, repeat examinations etc.; higher inputs required from faculties as the entire faculty members could not attend all time due to other responsibilities (time constraint); finding ways for assessment to carry weight-age in the overall performance assessment of students to improve attendance. However, the challenges provide opportunities to innovate and experiment with various models of integration and evaluate their utility in the Indian context, especially in the new curriculum. The challenges as identified by the study should be considered while scaling the program to other batches.

Recommendations:

A Focus Group Discussion with a sample of students and faculty prior to the implementation of Integration would add to information on student attendance and other perspectives to enrich the ILP in future. The assessment should have some weight-age in the internal marks of the students. A module prepared well in advance should include method of assessment so that students are informed of the weight age of marks. For integrated assessment it's always good to have an integrated question bank of MCQ, Short Answer questions and Clinical cases.

Establishment of Phase-Wise Curricular Sub-Committee and Alignment and Integration Team (AIT) to work in collaboration with Curriculum Committee under GMR 2019, is now in place to formulate and facilitate the integration at the institutional level. This requires robust planning and coordination amongst the medical educationists at all the levels. Integrated teaching can succeed only through an official institutional policy and not optionally by departments. The whole faculty should meet frequently to review the experiences of previous year and reform the local methods immediately/regularly.

Declaration:

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Conflict of Interest: Nil

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