

INTEGRATED TEACHING-LEARNING IN INDIA – ITS PERSPECTIVE AND SCOPE

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INTRODUCTION:

Integrated curriculum means teaching of many subjects together. It is also called correlated teaching or applied teaching. It is also defined as co-ordination among teachers of various disciplines for teaching a topic of clinical importance as a joint activity with a component of self learning by the student¹. The concept of integrated teaching gives the student an overall knowledge and completeness with respect to clinical scenario. It facilitates the student to learn the subject with correlation and helps to links the basic sciences with the clinical sciences.

There are essentially two types of integrated teaching- Horizontal and Vertical integration. Horizontal integration deals with the integration of the preclinical science subjects or paraclinical or clinical sciences. Vertical integration deals with the integration of the basic with the clinical sciences. This integrated teaching –learning has been introduced by the Medical Council of India to be included in the medical curriculum as a mode of assisted teaching and learning. Many medical schools in India have started integrated teaching in the curriculum, but not in the true sense. There are many loop holes which needs discussion and clarification.

This study is an effort to understand the awareness of the integrated teaching among Indian faculty, its merits and demerits, possibilities and scope in future.

METHODOLOGY:

The study design involved a web based discussion on the awareness of integrated teaching-learning, student and faculty's perception, scope and factors affecting possibility of integrated teaching in India. A survey was conducted among the faculty and students through online survey and questionnaire respectively. The discussion was categorized into four sub-topics moderated by the following fellows of our team.

The team included the following team members:

2008 fellows: Dr Ashwini and Dr Chitra

2009 fellows: Dr Seema, Dr Satisha and Dr Kalpana

- a) **Questionnaire on Integrated teaching awareness – Dr Ashwini, Dr Seema**
- b) **1st week- Introduction to Integrated teaching- Dr Satisha**
- c) **2nd week- Student opinion on In tegrated teaching –Dr Kalpana**
- d) **Survey on the feasibility of Integrated teaching-Dr Ashwini, Dr Seema**
- e) **3rd week- Scope of Integrated Teaching-Dr Seema**
- f) **4th week –Feasibility of Integrated teaching- Dr Ashwini and Dr Chitra.**

Guidance was given through the planning by the following faculty mentors.

Dr Thomas V Chacko,

Dr Vimal,

Dr Jyothi

The discussion of scope and possibility of integrated teaching was based on the results of the survey.

RESULTS:

The number of responses received during each week has been enlisted

1st week: 100 responses

2nd week: 85 responses

3rd week: 47 responses

4th week: 36 responses

The survey consisted of a questionnaire addressing on the awareness of integrated teaching and their feasibility.

The questionnaire had a set of 19 questions. The survey was conducted online and the results analysed. The questions were both open ended and closed ended. The results have been tabulated questionwise.

Sl. No.	Questions
1	Integrated teaching is
2.	Horizontal integration
3.	Vertical Integration
4.	Time integration
5.	Integration is done in the institution
6.	Describe the methodology
7.	Student perception
8.	Positive attributes
9.	Negative attributes
10.	Can integrated teaching be included in the curriculum
11.	Can integrated teaching be a replacement to the conventional method
12.	Factors required for integrated teaching
13.	Will the basic sciences be at stake or lose their individuality with the introduction of Integrated teaching?
14.	Does Integrated teaching give the comprehension of the subject as a complete one.
15.	When during the medical course should integrated teaching be introduced
16.	What should be the frequency of integrated teaching classes

Content analysis was done for open ended questions and likert scale was used for certain closed ended questions.

Sl. No.	Question 1: Integrated teaching is	Percentage of faculty answer
1	single teacher teaching all the disciplines related to a topic	0%
2	coordination and cooperation among teachers of different disciplines to teach important core topics as a combined activity	40%
3	faculty of different disciplines teaching a similar topic at the same time	10%
4	co-ordination among teachers of various disciplines for teaching a topic of clinical importance as a joint activity with a component of self learning by the student	50%

Sl. No.	Question 2,3 and 4 Define	Percentage of correct answers
1	Horizontal integration	45%
2	Vertical Integration	80%
3	Time integration	20%

Question 5: Is integrated teaching going on in your institution? Yes / No	
Yes	No
75%	25%

	Question 6: Methodology of integrated teaching going on in the institutions	No. of institutions
1.	Not applicable	8
2.	Topics of clinical importance are identified and discussed with the concerned department faculty and children	5
3.	Horizontal integration within the phase	3
4.	Organ system integration	2
5.	Problem based learning	2

Sl. No	Question :7 Have the students received /been able to adapt to the concept of integrated teaching	No. of responses
1	Positive adaption	6
2	Not applicable	6
3	Student have not received it with a positive attitude due to long hours etc	8

Question 8 and 9: Positive and negative factors attributed to Integrated teaching were analysed by force-field analysis as below:

Sl. No.	Factors favourable	No. of responses	Sl. No	Factors unfavourable	No. of responses
1	Corelates with clinical subjects	15	1	Getting coordination among faculty and various departments	15
2	Helps students by better comprehension	11	2	Organisation of time schedule and time management, lengthy sessions	10
3	Makes teaching interesting	2	3	Teacher preparation, planning, content finalization and updating of content	7
4	Holistic approach	10	4	Difficult to implement	5
5	Avoids repetition of topics	7	5	Additional and interested faculty needed	3
6	Team work promoted	5	6	Useless if the examination pattern is not integrated	2
7	Experience of sharing	4	7	Problem in students to adapt to the new method	1
8	Promotes self study	3	8	Needs dynamic balance	1
9	Increase humanitarian behavoiur and communication skills	2	9	Not relevant to doctors who do not go into practics	1
10	Better treatment by doctors	2	10	May become a mere ritual	
11	Feasible	1			
12	Helps in sensitising the student to topic	1			

	Question 10: According to you, can vertical integration be included in the curriculum?	Response count
A	Strongly agree	7
B	Agree	16
C	Uncertain	3
D	Disagree	1
E	Strongly disagree	1

	Question 11: Can integrated teaching be a replacement for the conventional methods of teaching?	Response count
A	Strongly agree	2
B	Agree	4
C	Uncertain	6
D	Disagree	10
E	Strongly disagree	2

	Question 12: Which of the following factors required for integrated teaching would be feasible in the present set up?	Response count
A	Team work	11
B	Time management	9
C	Cordination	12
D	Cooperation between departments	21

	Question 13: Will the basic sciences be at stake or lose their individuality with the introduction of Integrated teaching?	Response count
A	Strongly agree	3
B	Agree	2
C	Uncertain	3
D	Disagree	13
E	Strongly disagree	3

	Question 14: Does Integrated teaching give the comprehension of the subject as a complete one?	Response count
A	Strongly agree	8
B	Agree	13
C	Uncertain	0
D	Disagree	3
E	Strongly disagree	0

	Question 15: Does Integrated teaching give the comprehension of the subject as a complete one?	Response count
A	1 st year	15
B	2 nd year	6
C	3 rd year	1
D	4 th year	2

	Question 16: What should be the frequency of integrated teaching classes?	Response count
A	Once a week	12
B	Once a fortnight	6
C	Once a month	4
D	Once in three months	2

DISCUSSION:

The discussion has been made under the headings of the following headings based on the above results.

- a) Awareness and perception of faculty on Integrated teaching/learning
- b) Methodology of Integrated teaching
- c) Student perception on Integrated teaching
- d) Scope and Possibility of Integrated Teaching

Awareness of Integrated teaching:

Integrated teaching here means integration of organ systems.

The curriculum of integration is most worked and debated topic. The educational researchers though were non-medicine fellows gifted the medical education with the concept of “integration” which was accepted with prospect of opportunities and challenges. The Case Western Reserve University School of Medicine in USA was the first school to introduce the “**integrated curriculum**” in 1952.

The concept of this integrated curriculum included teaching based on problem solving, self directed learning by the student, curriculum designed as a continuum of subject and not by departments and integration of basic and clinical sciences. All this led to evolution of innovative ideas like Problem based learning²

The first and foremost objective of the survey was to know how familiar are the faculty regarding the terminologies and definition of Integrated teaching and learning.

When asked regarding the definition of integrated teaching and types of the same. The following results have been derived.

Out of 19 responses 52.6% gave correct answer and 41% have partially given right answer.

So the conclusion is that, though everyone knows about Integrated Teaching as integration of subjects at phase level or interphase levels 50% are not aware that it includes a self learning component by the students. This can be understood that student centered learning is a concept that needs to internalize in the teachers mind. And this needs time and continued professional development to happen among the faculty in the form of training in the planning and implementation of Integrated teaching.

From the results about awareness of vertical and horizontal integration, it is observed that most of the faculties are not aware of these terminologies.

In a disciplined based curriculum like ours in India, horizontal integration means all the departments within a Phase (& we have three phases - I MBBS or Pre-clinical; II MBBS or predominantly Para clinical & III MBBS or clinical) sit together and plan the teaching e.g. same systems covered during the same months simultaneously e.g. Cardiovascular system taught by anatomy and physiology. This helps the student understand the system better.

Vertical integration is of the exposition on a topic by all three phase departments. By this, the student knows the relevance of the basic science subject to his/her future role as a physician.

Methodology of Integrated Teaching

A ladder of eleven steps has been derived called as integration ladder which can be used to aid in planning, implementing and evaluation of integrated teaching. Using this ladder we can identify on which step of the ladder is integrated teaching in our institution.³

The question asked was to know the method of integrated teaching so as to know the ways in which it is being done.

From the results of the survey as to how is the integrated teaching done in their institution. First of all, 75% of all responders are conducting integrated teaching in their institutions. The integrated teaching is being done as Problem Based Learning, horizontal integration wherein there is more of temporal integration than the correlation integration.

In most of the colleges, vertical integration is being done with the help of coordination of concerned department in the form of interaction between the faculty and students.

Community medicine is doing a realistic type of integration in the form of ROME camp wherein the discussion of the clinical case happens at the rural set up in the presence of the concerned physicians. Another way of integrated teaching was done using epidemiological studies and the theory points were discussed there off.

With all these varied methods of integrated teaching, an ideal integrated teaching would happen along the following steps.

- Identifying topics of importance and relevance to public health.

- Planning with coordination of the concerned departments and scheduling the topic by organizing the session objectives, break up of sessions.
- Starting of the session with the help of a case scenario and its relevance to day to day practice.
- Preliminary session should discuss the concept of basic sciences related to the case scenario followed by the systemic integration by the clinical departments.
- The sessions may be more than one.
- The focus should be the key points need to be understood by the students than just transmitting information as the student has to do self learning.
- Lastly summarise the key learning points.

Having a perfect integration in the curriculum is not possible. Various medical schools having integrated curriculum have various types and extents of integrations but none can prove that their integration is 100%.

Another method that came out in the discussion was the hybrid curriculum of integrated teaching. This is a curriculum that involves both the positive attributes of integrated teaching and conventional or discipline based curriculum.

The ideal method is the wedge curriculum that has integrated teaching from the first day of the medical curriculum. Initially more stress is based on basic sciences and less topic of clinical sciences. As the students enter the second and third year the basic sciences reduce and clinical sciences increase.

Most of the institutions follow the conventional didactic lectures assisted by sessions of integrated teaching as mentioned above. The integrated teaching can be in the form of problem based, team based, case based and need based learning.

Characteristics of Integrated teaching:

Integrated teaching aims at providing a body of knowledge instead of giving it in bits and pieces by isolated departments.

The positive and negative attributes of integrated teaching has been enlisted in the order of frequency as mentioned by respondents.

Positive attributes of integrated curriculum

- When the curriculum is integrated, overlap of topics taught is avoided and saves time.
- The teachers and students of an integrated curriculum are often well informed about the overall goals to be achieved by the student.
- The learning of the subject in such an environment seems more meaningful as the students are able to link and apply the basic sciences and clinical sciences.
- By integrated teaching the student is exposed to the case in a holistic manner which would result in physicians of first contact giving meaningful prescription.

Negative attributes of integrated curriculum

- It is very difficult to co-ordinate an integrated curriculum with the concerned departments as this depends on level of motivation, interest and zeal to experiment and assert the importance of integrated teaching.
- It can be expensive and it is difficult to setup the integrated curriculum when compared to the discipline-based curriculum.
- The process of planning, processing, implementation is lengthy, time consuming, needs cooperation and increased manpower and teamwork from different disciplines.
- The existence of integrated teaching demands the most essential but difficult that is development of an integrated type of assessment for the integrated curriculum.

Another important question that was raised was will the basic sciences lose their individuality with the introduction of integrated teaching. 54% have disagreed while 20.8% have agreed.

The basic sciences may lose its individuality as the clinical faculties are competent enough to teach the relevant basic science subject especially with respect to anatomy and physiology.

Student perception of integrated teaching.

Integrating a curriculum is a very complex process. It is differentially understood and experienced by students and faculty and refers to instructional method, content, faculty work or synthesis of knowledge in the minds of learners

Integrated teaching has been experimented, evaluated and appreciated by the medical educators most of whom are non-science fellows. The main stakeholders of integrated teaching are the students and the faculty.

A study that dealt with the perception of students on problem based learning (PBL) observed that the students had a positive opinion about the concept and methodology of PBL. But further studies are needed to come to stronger conclusions⁴

A study dealing with opinion of students on the appropriateness of time management, content, teaching-learning method in regard to revised integrated curriculum revealed three important steps to be considered. They were to facilitate an Integrated Curriculum committee, develop teaching-learning methods, and guide student participation.⁵

Another study that dealt with evaluation of students perception on case based integrated teaching revealed that students felt that this type of teaching was patient centered, avoided repetition of topics and improved communication by group interaction. **6**

Sixty percent students rated the program of integrated learning program(ILP) good to excellent with reference to appreciation, understanding and application of basic science knowledge in health and disease. Seventy eight percent felt that this program will help them perform better in later days of clinical training. However sixty percent students felt that ILP will not help them perform better at the first professional examination. Seventy two per cent of faculty agreed that this program improved understanding and application of basic science knowledge of students. Ninety percent of faculty felt that this program will help them perform better in later days of clinical training. **(Bharani)**

A survey was conducted in our institution on integrated teaching on 125 students out of which 122 students have replied. 36% have appreciated traditional teaching where as 30% favored integrated teaching. Another 33% are uncertain and not able to decide. The students have been able to correlate and apply the basic science knowledge in the clinical sciences. They are able to comprehend and this has effected in good clinical performance and university examinations by the students

Though this is the opinion by the students in the survey, the same student in reality are showing only 40% of attendance. When this paradox was tried to reason out, the discussion evolved out that non alignment of the assessment methods with the integrated teaching method could be the cause for the low attendance. There is a need for innovative assessment method for integrated teaching to be successful.

Certain participants voiced the success of integrated teaching in their respective institutions was due to the assessment methods correlated with integrated learning. The negative attributes of integrated teaching enlisted by students were lack of interest, time consuming and failure to comprehend the linkage between the different subjects of the curriculum, thus unable to apply the basic sciences into clinical sciences.

The most important criteria for integrated teaching to be really integrated is the effort to provide linkage between the subjects taught with relevance to a clinical topic. The faculty fails to link their subject with the rest of the curriculum. As a result, the student learning is not satisfied and thus not successful. So the link between the different subjects and disciplinary perspectives being represented in a single block is very crucial in the success of integrated teaching. **(Reference Marina)**

What is most important is repeatedly communicating to student why they are being made to do each of the activities and explicitly link it to their experience in other departments. The didactic lectures along with integrated teaching will help in reinforcement of whatever the student learns.

Letting them know what they are expected to learn and how it ultimately is linked to their work as doctors needs to be communicated to them repeatedly and by all teachers. The student's often do not understand the link of community health with the basic or clinical sciences until the concerned people from these departments and officials speaks about the importance of Population Health to them directly. Otherwise, student's will be "role modeling" their clinical faculty who knowingly or unknowingly express less importance of community medicine and "drags" them to the Individual Health Care.

SCOPE AND FUTURE OF INTEGRATED TEACHING:

Most of us have a '**commonsense awareness**' as to what integrated teaching is.

Integrated Teaching as a specific teaching methodology or curricular program in Medical Education has specific names for specific activities.

The first step in implementing integrated teaching is to create the faculty awareness with out which it would be like any regular theory classes taken by faculty of different disciplines.

If Integrated teaching has to come in a large scale implementation, one needs to make the faculty aware about the details, descriptions and responsibilities. More than just

awareness, the regulatory bodies have to take a huge leap to increase the awareness workshop and give hands on as to how actually the process of planning, processing and implementation and feedback on Integrated teaching from the faculty and students has to happen.

The concept of identifying the nodal centers at state level by the MCI in capacity building of the faculty is a major positive step. But the need of the hour is to focus and have specifications so that the learning leads to productivity in the form of increased integrated teaching programmes.

Maximal efforts have to be made to **encourage integrated teaching** between traditional subject areas using a problem based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both understanding and resolution of the problem. Every attempt should be made to **de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases.**

Every attempt is to be made to encourage students to participate in group discussions and seminars to enable them to develop personality, character, expression and other faculties which are necessary for a medical graduate to function either in solo practice or as a team leader when he begins his independent career. A discussion group should not have more than 20 students

It is necessary that training should be multidisciplinary, quality oriented and expanded to state hospitals. It should also provide education for primary care medical ethics, pharmacoeconomics and pharmacovigilance and research technology. The teaching of basic medical subjects could be integrated and more time could be devoted towards the teaching of clinical and bedside education.

73.7% of the colleges in the survey are doing integrated teaching and 26.3% are not doing

This is a very positive attitude in medical education.

The methodology is different in different colleges and the methods described in the survey are

1. organ systems integration and a hybrid approach
2. Concept of lead departments & collaborating departments based on subject of

importance. The lead department calls for a planning meet and jointly plan a integrated session.

3. PBLs and skill labs and PBL based Organ System
4. Time integration.
5. Combination of both vertical & horizontal integration
6. Integration is done separately for different terms
7. Topics of clinical and theory imp and dealt.

With many methodologies happening, a question was posed as to the development of standardised method.

One option given by a participant is to have six IBMS subjects along with Community Medicine in the first two years and going in for organ system-based integration supported by PBLs and Correlation Seminars. There is early clinical contact with some time spend in the wards to emphasize Clinical Teaching and the clinical relevance of various subjects.

The other option mentioned is to have a predominantly PBL-based system of teaching which follows organ systems. This has been followed in many medical schools in developed nations. Weeks are fixed for each organ system and students approach the system through clinical cases. There is a Basic concepts slot in the beginning followed by various systems. There has been debate about whether a paper and pencil case or a case supported by different multimedia resources or real patient cases will be the best for teaching. Community Medicine has got good scope for integration as has been done in many medical schools. In the Community the different basic science subjects can be integrated with social and cultural issues and clinical subjects. Medical schools especially in Canada and Australia are experimenting with decentralized schools and learning in the community. These countries have isolated rural areas and problems of health care delivery in rural areas. Considering the substantial problems of healthcare delivery among the urban poor and the rural population decentralized schools and a 'community' system of education should be given serious consideration in South Asia also.

Many medical schools are following a double helix curriculum with the basic sciences and clinical subjects intertwined throughout the course. During the first two

years the clinical sciences are used to set the stage for and stimulate learning of the basic sciences. During the clinical years basic sciences are revisited in the light of increased knowledge and understanding of the clinical subjects.

For integrated teaching to occur we need high quality faculty, flexibility in planning and a decentralized system of medical education. FAIMER has been active in improving the human resource in terms of training faculty members and preparing them for educational leadership.

Having high quality faculty is right, but decentralizing the system, will it not lead to substandards. It is well reflected now with the deemed universities. They have been derecognized, is it not partly because of decentralization and not keeping up the standards? Will not there be nonuniformity if decentralization occurs?

Decentralization will work only if you have committed and dynamic faculty at all Institutions

Having an integrated curriculum needs people across basic and clinical sciences to sit together and chalk out the objectives and this requires intrinsic motivation. State Universities to which the colleges are affiliated should try to formulate this within MCI regulations and conduct workshops to deans and faculty of the affiliated colleges for implementation. The state universities can have a team which shall inspect colleges, evaluate the functioning of these programs and suggest corrections if any. This might be a feasible model rather than making it a clause under MCI regulation.

The results of the question whether integrated teaching could be included in the present curriculum said 95% agreed to it. But the results of the question whether integrated teaching could replace the present curriculum was contradictory to the previous question. 75% felt that integrated teaching could not replace the conventional approach. The paradox around the contradictory replies was discussed.

This could be because of lack of proof of effectiveness of integrated teaching.

Integrated teaching is good but at the same time it can not replace the existing conventional curriculum totally" is valid. This difference could be due to difference in the in "felt needs" of the students who are targetting best performance in coming up examination and "felt needs" of teachers who take into account demands of conventional curriculum and newer methods like IT, PBL etc.

The need of the hour is to document the methodology, assessment practices, stakeholder's opinion, its effectiveness of integrated teaching in comparison to conventional method in the form of publications.

A valid opinion that the difference in opinion on integrated teaching and decreased interest of the students to integrated teaching could be because of the **assessment method not being modified to the particular type of teaching learning method.**

Integrated teaching can be assessed as OSPE with respect to a case with multiple stations covering all subjects. In this way student comes to know how integrated learning can be useful. And we will be assessing the students completely with respect to the case scenario.

CONCLUSION:

With all these discussions integrated teaching has evolved as a possibility that can be achieved with efforts by like minded faculties with the needed group dynamics. Medical Education has a major role to play with respect to capacity building, devising curriculum, and implementation of an integrated examination pattern.

Integrated teaching and learning has more positive effect on the community as the doctors of first contact trained in an integrated manner will definitely prove to be better in diagnosing, management of clinical cases than the present day disciplined based trained doctors.

Though there are certain doubts as to loss of individuality and loss of in depth knowledge of the faculties involved in the integrated teaching-learning, the students and the teachers must be emphasized on the objectives of the integrated teaching.

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LIST OF REFERENCES

- 1) **Medical education-Principles by JIPMER, Ponicherry**
- 2) (<http://casemed.case.edu/about/history.cfm>)
- 3) Integration ladder · R M Harden *MEDICAL EDUCATION* 2000;34:551±557
- 4) **Students' perception of Problem Based Learning in Kathmandu University school of Medical Sciences**Karmacharya **BM1, Risal P2** *Modern Trends in Medical Education – Monograph* 2009
- 5) An Evaluation of Integrated Curriculum Based on Students' Perspective, **Sun A Oh1**, PhD, **Eun Kyung Chung**, MD, **Jung Ae Rhee**, MD, **Yung Hong Baik**,
- 6) **Innovative “Case-Based Integrated Teaching” in an Undergraduate Medical Curriculum: Development and Teachers' and Students' Responses**
Wing Pong Chan,1MD, Chung Yi Hsu,2MD, PhD, Chuang Ye Hong,3MD,
*PhD***Ann Acad Med Singapore 2008;37:952-6**
- 7) <http://kumj.com.np/ftp/issue/10/159-164.pdf> 63