Stepping Towards an Integrated Medical Curriculum: A Journey from Talent to Skills - A Pilot Study

Kauser Abid¹, Abdul Majid², Farzana Majeed³

¹PBL Coordinator, Medical Education Department, Faculty of medicine, University Tabuk, KSA. 
²Prof and Head, Physiology Department, Islamabad Medical and Dental College, Islamabad 
³Assistant Professor Physiology Department Islamabad Medical and Dental College, Islamabad 
(²&³Bahria University, Islamabad)

Abstract
Objective: To investigate the impact of basic, preclinical and clinical science integration on student's learning by large class format integrated session in undergraduate medical curriculum.

Subjects and Methods: This cross-sectional study was conducted at Islamabad Medical and Dental College. Problem identification and need assessment was done for students and faculty. A total of 100 first year medical students of session 2011-2012 were registered in groups of ten with one facilitator in each group. Cardiovascular system as prototype was taught by basic, preclinical and clinical disciplines in an integrated manner. To have clinical relevance the first year medical students were exposed to a paper case on myocardial infarction. They were facilitated by the group facilitator in identifying their learning needs and information gathering. Groups met for debriefing and interaction with the involved faculty after three days in large class format clinical session. Formative assessment was done at end of session followed by student's feedback.

Results: Participation was 100% with team work. Majority of students considered this strategy ideal for problem solving, critical thinking and clinical reasoning. The faculty survey came up with 96% of the members in favour of stepping to temporal level of integration. In student survey 93% of the students considered integration between basic/preclinical and clinical subjects useful in addressing their learning needs.

Conclusion: The study showed that along with horizontal integration a vertical integration is welcomed by students’ right from the start of their medical school. By involving all stakeholders in curriculum planning an integrated learning approach for basic/preclinical and clinical disciplines under a conventional curriculum can be done.

Key words: Curriculum, Pilot project, System integration

Introduction
Most people use Talent and Skill interchangeably. However, they are not the same and it can make a huge difference if we can identify and differentiate between them. Talent is an innate ability or aptitude to do something and it can’t be taught. Skill, on the other hand, comes from knowledge and is developed through practice. For any endeavor there is a combination of talent and skill that comes to bear in order to determine the final outcome. When this was applied in the field of medical education the results were mind blowing. The paradigm shift from talent into skills fosters self-directed lifelong learning, problem solving skills, critical thinking, and clinical reasoning.

The situation in most of our medical colleges is quite alarming as talent coming to us is not properly transformed into skills. We as educators teach them the way we were taught and believe in how and how much to teach and not how they want to be taught. We feel comfortable with the didactic system of teaching and learning strategies. If we look around in the real world learning is taking place holistically with input from several channels. But the situation is quite opposite in undergraduate curriculum in most of the medical schools. Instead of catching pace with the changing needs in the health professional education sector, we come across discipline based approach with no integration and without integrating the basic preclinical and clinical subjects. There are examples of institutions that have an integrated medical curriculum with non-compartmentalized approach for the first two years with integration of basic science subjects (i.e. anatomy, physiology, histology, embryology) with organ system based approach, in every system of the body along with some blend of problem based learning.¹ There is intense emphasis on the need for greater level of integration of subjects in the medical curriculum as mentioned in GPEP report,² ACMI-TRI project report ³ and the recommendations of General Medical Council, UK.⁴
Worldwide integrated curriculum is taught either as interdisciplinary or as thematic teaching or in a synergistic mode. Integration in medical curriculum is helpful to the students to learn concepts through holistic approach. This way they develop a realistic and professional approach towards patient treatment or health care strategy planning. In integration the organization of teaching matter is done in a way to interrelate subjects that are taught in separate academic courses or departments. Although we see a trend in basic sciences curriculum towards integration, including PBL as an integrative function, but the integrated teaching does not necessarily require the adoption of a total problem-based approach to learning. Many effective integrated programs are not problem-based which means that integration can be organized around case-based learning in a traditional curriculum.

There is growing trend worldwide to adopt an integrated curriculum approach so as to keep in pace with the changing needs in the health sector. It is wise to involve all the stakeholders in need assessment and problem identification for this issue. If we look around we can find different levels of interpretation of integration among the stakeholders. The importance of this concept of integration has to be clarified and at the same time they should be brain stormed for its need.

Encompassing situation at our national level; most of the Medical colleges in Pakistan except few in the private sector are following a traditional curriculum, characterized by "discipline wise model" with a high degree of compartmentalization into subjects of basic, preclinical and clinical sciences. In this scenario several areas of redundancy, repetition and overlapping of topics have been found. This state of affair has prompted the Medical and Dental Council of Pakistan to take appropriate and timely action and they have provided framework and timeline to the medical colleges to adopt a need based curriculum for undergraduate medical education in Pakistan. Pakistan Medical and Dental Council has recommended a teaching approach characterized by maximal efforts to encourage integrated teaching between traditional subject areas using a problem based learning approach and de-emphasize compartmentalization of disciplines so as to achieve both horizontal and vertical integration in different phases.

But at the same time we cannot overrule that an integrated medical curriculum can only be implemented successfully when all stakeholders are taken on board and they all identify the problem. Some form of need assessment has to be done with the goals to: (1) get feedback from all the stake holders, regarding the current situation and the recommended one. (2) Let faculty familiarize with the curriculum integration and brainstorm all related issues, (3) allow students and faculty to identify their roles and responsibilities in an integrated learning environment by running a pilot project. This whole exercise will let all the stakeholders to experience and explore advantages of an integrated medical curriculum. On a broader canvas it will be a value addition for the gap analysis before its full implementation.

In an integrated learning environment early clinical exposure (ECE) provides an active, experiential learning from patients with practicing clinicians, and serves as the beginning of a life-time of learning focused on the patients. Breaking away from the practice of having only traditional didactic lectures, ECE program can be included in basic and preclinical years of undergraduate medical curriculum. ECE programs are now gaining popularity and becoming an increasingly widespread component of undergraduate medical education.

In our institutional setting, one approach was to have a drastic change and the other as stepping forward with evidence-based approach through pilot programs. The later one was considered to be with more promising outcomes as proven by literature review. In pursuit of current recommendations a pilot study was conducted at Islamabad Medical & Dental College. The objective was to develop and implement an integrated learning session incorporating multiple teaching methodologies in order to provide scientific evidence to the stakeholders.

| Table 1: Responses to close ended questions (5-Point Likert scale) |
|---------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| S. No  | Strongly agree (n=100) | Agree (n=100) | Neutral (n=100) | Disagree (n=100) | Strongly disagree (n=100) |
| Q#1    | 41               | 42              | 03              | 05              | 02              |
| Q#2    | 42               | 51              | 07              | 00              | 00              |
| Q#3    | 33               | 49              | 08              | 02              | 02              |
| Q#4    | 40               | 41              | 06              | 04              | 01              |
| Q#5    | 53               | 29              | 09              | 01              | 00              |

Subjects and Methods

After approval from the ethical committee the pilot study was initiated. The study was done in two phases.

Phase I

Problem identification and Need assessment

For Students: A brain storming session was arranged for the student’s awareness and to take feedback on practicing traditional curriculum using a 5-point Likert scale. Areas for feedback included level of satisfaction from discipline-based approach, teaching of different body systems at varied timings, and need of integration among basic, preclinical and clinical subject areas.

For Faculty: A brain storming session on curriculum integration and PMDC recommendations for the medical colleges in Pakistan was arranged. It was followed by feedback from faculty for patient centered learning; team based learning approach and the level of faculty satisfaction with the traditional curriculum. The faculty was asked to make comments on the current level of integration and to

82
build consensus for the desired level of integration for undergraduate curriculum in the light of PMDC recommendations.

**Phase II**

**Pilot Project** - In order to provide scientific evidence the pilot project was carried out in three steps

**Step 1:** Basic and preclinical faculty members carried out the teaching activities for the cardiovascular system in an integrated manner with an organ-system based approach.

**Step 2:** Innovation in the form of large-class format integrated session was prepared around a clinical case of myocardial infarction. For this session a meeting was held with the involved basic science disciplines along with clinical faculty in which learning objectives for the clinical case were set. On the basis of learning objectives, a blue print for a formative assessment was drafted.

**Step 3:** Facilitators exposed their groups to the paper case. As there was no time allocated for self-study on the timetable so students were given flexibility of time to brainstorm and to meet learning objectives as a group to gather information. The groups were asked to report back after three days for debriefing and interaction with involved faculty in the (LCF) clinical session. At the end of the session the student had a formative assessment encompassing all related basic, preclinical and clinical subject areas. For this pilot project the student’s feedback was taken on a 5-point Likert scale as five close ended questions:

1. Q1: The LCF integrated clinical session was in the context of basic and preclinical teaching program for cardiovascular system.
2. Q2: The LCF integrated clinical sessions on real life problems develop interest in clinical classes.
3. Q3: Clinical classes in the form of LCF integrated session are useful for clinical exposure in preclinical years.
4. Q4: The LCF integrated clinical session improved problem solving skills.
5. Q5: Learning in groups helped in the development of a team work approach.

For a more qualitative analysis the student’s feedback by open ended questions was taken as:

- Enlist favored points for LCF integrated clinical session.
- Enlist aspects of dislike for LCF integrated clinical session.
- Suggest areas of improvement for LCF integrated clinical session?
- Take home message from this session in terms of change in attitude?

**Results**

In the need assessment survey of students, 93% of the students reported that lack of integration and discipline based approach instead of an organ-system based curriculum is not helpful in making connections between subjects. The open house discussion session with the faculty identified that currently the medical curriculum is at the isolation level and 96% of faculty members suggested that temporal level of integration as in Hardens integration ladder is a good stepping off towards integrated medical curriculum. The results of close-ended questions on the 5-point Likert scale, as shown in table 1, showed that 83% of the students have considered the LCF clinical session contextual to cardiovascular system basic and preclinical subject teaching. The presence and participation by the entire first-year students proved that clinical classes if properly planned and facilitated, develops interest in clinical sciences in early medical years as shown by 93% positive response. Eighty two percent of students were in favor of exposure to real life problems during basic and preclinical years of medical curriculum. Eighty one percent deemed this session helpful for developing problem-solving skills development. Eighty two percent of students considered effectiveness of learning in groups for team work spirit. We found 98% satisfactory result in the formative assessment. Regarding the favored points for the LCF integrated clinical session majority appreciated this innovation in terms of clinical relevance to basic science teaching. Most of the students considered it a good exercise for developing learning objectives, problem solving skills, self-directed learning and critical thinking. At the same time, team work approach was highly appreciated by the students. The aspect that was mostly disliked by students was mainly time constrains as no time was allocated for group interaction and they had to manage it on their own. For this they asked some time slots as self-directed study in the time table. Secondly they were all willing to have a direct interaction with the patient in their clinical class. Feedback from the students on areas of improvement for the LCF integrated session was in terms of allocated time slots in the time table for group interaction. Real world clinical cases give students an opportunity to revisit case from basic and preclinical application of knowledge. Almost all students demanded that this sort of activity should be arranged frequently as it has made them learn like a physician and think like a physician.

The students conveyed in their feedback that after passing through this activity they have developed a positive attitude towards clinical classes during basic science year. They reportedly feel satisfied for the first time that they were not dealing with books only but with real life patient’s problems.

**Discussion**

The present system of education follows a building block principle where each subject has its own frame, and is restricted to one part of the course. The disadvantages of
such a system are unnecessary repetition, disjointed approach to teaching leading to confusion in the student's mind and thus failure of grasping the subject of medicine as a whole. Curriculum integration has therefore evolved as an important strategy in medical education. Various integrated medical curricula have been adopted by many medical schools all over the globe to ensure holistic approach rather than a fragmented one in medical education to encourage meaningful learning. Our study has also tried to provide proof to our stakeholders that integrated medical curriculum can prepare students to properly deal with real life patients problems.

In our integrated model, courses such as histology, anatomy, pathology, pharmacology, physiology and medicine, were taught as part of the integrated teaching. Thus, during the CVS block, students learned the basic and preclinical subject’s topics at the same time from different subject aspects. The weekly schedule of students was divided into teaching/learning activities that were repeated each week: lectures, small group sessions through tutorial classes and a case based learning activity as LCF session around a real patient. Roberts Cet al in 2005 conducted a study in basic science in which PBL curriculum objectives for cardiovascular module were run as large class format style. They found no significant difference in the learning outcome. It showed that in institutions with limited resources large class format integrated sessions is a useful alternative way out. In our institutional setting both the faculty and the students appreciated the program as a successful attempt in terms of understanding of basic science knowledge in the context of health and disease through an integrated learning program incorporating diverse teaching learning methods. The LCF session brought about for the first time a coordinated approach to teaching and learning amongst the basic science faculty as well as between the preclinical and the clinical science faculty in our institution.

An integrated approach in clinical teaching is reported in some of the medical schools in India. It is practiced as student centered case based learning to enrich clinical teaching. They found such programs helpful to the students to have integration of knowledge together with improved attitude towards medical education.

In Pakistan we have Aga Khan Medical College in Karachi, who has a running integrated medical curriculum as a bench mark. With the passage of time now we are having many medical colleges who are running a hybrid system and are moving slowly towards a more integrated educational approach. The present Pilot study as large class format integrated session in Cardiovascular System is an innovative attempt to introduce horizontal and vertical integration in 1st year of our medical curriculum.

**Conclusion**

The study showed that it is possible to adopt an integrated approach in the first year of medical teaching under a conventional curriculum. In institutions with limited resources to support small group problem-based learning (PBL), the large class format integrated sessions (LCF) might be a useful alternative instructional method. Students can achieve equivalent outcomes with either small group PBL or large class formats, in terms of basic science knowledge application.

**Acknowledgements**

We acknowledge (late) Prof. Dr Naseem Ullah, dean of Islamabad Medical and Dental College for his guidance and co-operation in this pilot study.

**Conflict of Interest**

This study has no conflict of interest to declare by any author.

**References**