Case Based Learning in Surgery

(Real Clinical Case Triggered Problem Based Learning)
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- Consultant, Persistent System Pvt. Ltd
- Chair, National Bioethics Curriculum Implementation UNESCO Chair in Bioethics, Haifa
- Ex Dean, B J Medical College Pune and RCSM Govt. Medical College, Kolhapur
- Ex Professor of Surgery, B J Medical College Pune
Major curricular component

Curriculum

Instruction
Methods
Assessment
MEDICAL Education is Adult LEARNING
Adults want to ...

- learn it, then use it
- Learn only when it is relevant
- solve problems to learn concepts
- learn at their own pace
- set their own learning objectives
- preserve self-esteem
- Have different ideas about what is important to learn
Spiral Model of Curriculum Development

Set New Goals

MCI

EDUCATIONAL OBJECTIVES

PROGRAMME IMPLEMENTATION

FORMATIVE ASSESSMENT

EVALUATION

STUDENT TEACHERS OBJECTIVES TECHNIQUES

REQUIREMENT OF TEACHING
HEALTH SYSTEM
SOCIETY
INDIVIDUAL
ACADEMIC
Integration of Medical Education

- MCI Recommendation 1997
- Vertical and Horizontal
- Hardly any attempt by any University
- Problem based learning achieves maximum amount of Integration
What is problem based learning

A learning method based on the principle of using problems as a starting point for the acquisition and integration of new knowledge.”

H.S. Barrows 1982
Ausubel’s subsumption theory

“...The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly.”

Ausubel, 1968
<table>
<thead>
<tr>
<th>Traditional Learning</th>
<th>Problem Based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus is on teaching</td>
<td>Focus is on learning</td>
</tr>
<tr>
<td>Encourages competition</td>
<td>Encourages co-operation</td>
</tr>
<tr>
<td>Fewer learning events</td>
<td>Wider range of learning events</td>
</tr>
<tr>
<td>Subject oriented</td>
<td>Situation oriented</td>
</tr>
<tr>
<td>Involves information mastery</td>
<td>Involves information management</td>
</tr>
<tr>
<td>Faculty role is lecture based</td>
<td>Faculty plays several roles: tutor, advisor, resource person etc</td>
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</tbody>
</table>
Claimed Advantages Of Problem Based Learning

- Students use a deep learning approach
- Improvement of general problem-solving skills
- Best Method of interactive learning
- Meaningful Learning
- Development of self-directed learning skills
- Increased retention of knowledge
- Resource utilisation
- Maximum Integration
- Better Presentation skills
- It is more fun
- Lifelong learning skills
We should not just follow Problem Based Learning because it is Western.
Problem Based Learning (PBL) Brief History

- PBL was first developed at McMaster University in Canada in the 1960's.
- PBL methodology is currently used in more than 80% of medical schools across the United States and Canada.
- Used now in Singapore, Malaysia and some African countries.
New curriculum - systems-based and “integrated” (1991, revised 1997)

<table>
<thead>
<tr>
<th>Yr 1</th>
<th>Intro Basic Sci.</th>
<th>Clin Skills</th>
<th>MIS.</th>
<th>Micro/Imm, Inf.Dse</th>
<th>MSK, Derm, Hem/onc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yr 2</td>
<td>Neurosci, Psych, ENT, Sphth</td>
<td>Neurosci, Psych, ENT, Sphth</td>
<td>G-U, Resp, Cardiovasc</td>
<td>Critical Enquiry</td>
<td></td>
</tr>
<tr>
<td>Yr 3</td>
<td>Repro, Endocrine, GI/Metab. (A.M.)</td>
<td>Repro, Endocrine, GI/Metab. (A.M.)</td>
<td>Clin Skills (P.M.)</td>
<td>- Clerkship -</td>
<td></td>
</tr>
<tr>
<td>Yr 4</td>
<td>- Clerkship -</td>
<td>- Clerkship -</td>
<td>LMCC</td>
<td></td>
<td></td>
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</tbody>
</table>
Problem-based Learning, especially in the context of large classes

TOPICS

- What is PBL?
- Our use of small group, self-directed PBL
- Books and resources to help you with PBL

What is PBL?

Problem-based Learning: PBL is any learning environment in which the problem drives the learning. That is, before
University of Delaware

http://www.udel.edu/pbl/
PBL Clearinghouse

PROBLEM-BASED LEARNING

UD PBL articles and books
UD PBL in the news
Sample PBL problems
UD PBL courses and syllabi
PBL Clearinghouse
PBL Conferences and Other PBL sites
Institute for Transforming Undergraduate Education

"How can I get my students to think?" is a question asked by many faculty, regardless of their disciplines. Problem-based learning (PBL) is an instructional method that challenges students to "learn to learn," working cooperatively in groups to seek solutions to real world problems. These problems are used to engage students' curiosity and initiate learning the subject matter. PBL prepares students to think critically and analytically, and to find and use appropriate learning resources. -- Barbara Duch

PBL2002: A Pathway to Better Learning
Welcome to our Web site!

The Problem-Based Learning (PBL) Web site was established in 1998 in conjunction with two grants from the Pew Charitable Trusts. Since that time, Samford took on the challenge to not only incorporate PBL into various undergraduate programs within the Schools of Arts and Sciences, Business, Education, Nursing and Pharmacy, but also to document best models of PBL practice in course portfolios.

The Center’s mission was to support the Samford community in enhancing student learning through the training, implementation and documentation of PBL and other methods of active, student-centered, collaborative, inquiry-based learning, and to share these practices with other educators. The site corresponds to Samford University’s efforts to be a learner-centered community that nurtures the intellectual, emotional, physical, social, and spiritual development of students and teachers.

The goal of the Web site is to provide administrators, faculty, students, and parents with detailed information on the components, implementation, assessment, and documentation of PBL. The site also contains a guide to relevant workshops and conferences, links to many other PBL-related Web sites, and a listing of institutions that are using PBL in their undergraduate and/or graduate programs.

We hope you will find this Web site of assistance. If you have any suggestions or comments pertaining to this site, please contact us.

Thank you.
Welcome to IMSA's Center for Problem-Based Learning's Web Site. Click on one of the four pinned notes at the top of this screen to explore one of the main areas of our site. To help you navigate throughout this site, these notes appear on every page and allow you to travel to each section of the site, and the door will take you back to this page. Please enjoy your journey into PBL, and we encourage you to contact us!

Feel free to take a look at our site map.
Do you think Problem Based Learning is feasible in Traditional System?
Can you adapt PBL in MCI determined Curriculum
Introduction Of Modified PBL in Traditional Curriculum

- Case Based Learning was triggered by actual clinical cases
- Clinical skills were taught during process
- Faculty from all the departments were used as Resources
We should utilize the large no of patients for teaching.
Components of CBL

- Clinical Scenarios developed from real cases in ward
- Student Tutorial Group
- Tutor Facilitators
- Institute
Case Based Learning
What is Case based learning?

Clinical Scenarios developed from real cases in ward

- **Tutors took actual clinical cases in the ward including** Acute cases admitted in emergency
- Charted down **learning objectives** and were modified to meet the demands of the existing syllabus of the University
Case Based Learning

What is Case based learning?

- **CBL Tutorial Group**
  - Small group teaching (15-17 students)
  - Rotary role playing by students
    - Chair
    - Scribe
    - Presenter
    - Time keeper
    - Group member
Case Based Learning

What is Case based learning?

- Facilitator (Tutor)
- A knowledge of the process of CBL
- Commitment to student-directed learning
- Ability to generate a non-threatening environment while still acting to promote discussion and critical thinking
- His role is to supervise that learning objectives are discussed
- Chief Residents trained as Tutor
The Iterative Process of CBL

1. Brainstorm-hypothesize
2. Identify learning issues
3. Read the problem
4. Evaluate
   - Research-Learn (2-4) days
5. Consult the Faculty
6. Take the formed opinion
7. Report
8. Next CBL
9. Return-Reread-Review
Conclusion

Students’ determination of their own “level of ignorance” (Learning Issues), by themselves, is fundamental to CBL.
An important part of PBL is the **learning** between sessions.
Traditional Clinic

“Teacher”

“Students”
Program Evaluation

- Student Evaluation
  - Evaluation of CBL
    - Student formatively evaluated
  - Evaluation of Tutor
  - Evaluation of IPA (Individual process assessment)
- Evaluation of Cognitive Domain
- Evaluation of Student Perception
- Faculty Perception about the program
Student presenting solved learning issue
Group patiently listening
# Evaluation of Cognitive Domain

Scores of SAQ and EMQ in Case Based learning

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>STUDY GROUP</th>
<th>CONTROL GROUP</th>
<th>‘t’ value</th>
<th>‘P’ value &amp; Statistical Significance</th>
<th>Mann-Whitney test statistic</th>
<th>‘P’ value &amp; Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘n’</td>
<td>Mean</td>
<td>SD</td>
<td>‘n’</td>
<td>Mean</td>
<td>SD</td>
<td>‘P’ value &amp; Statistical Significance</td>
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<tr>
<td>SAQ</td>
<td>57</td>
<td>3.4561</td>
<td>1.6698</td>
<td>55</td>
<td>2.7273</td>
<td>1.2088</td>
</tr>
<tr>
<td>EMQ</td>
<td>57</td>
<td>18.4912</td>
<td>3.7087</td>
<td>55</td>
<td>17.636</td>
<td>3.6381</td>
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<tr>
<td>TOTAL</td>
<td>57</td>
<td>21.9474</td>
<td>3.8749</td>
<td>55</td>
<td>20.363</td>
<td>4.3392</td>
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</tbody>
</table>
Marks obtained in SAQ and EMQ

<table>
<thead>
<tr>
<th></th>
<th>SAQ</th>
<th>EMQ</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study</td>
<td>3</td>
<td>18.49</td>
<td>21.94</td>
</tr>
<tr>
<td>Control</td>
<td>2.72</td>
<td>7.63</td>
<td>20.36</td>
</tr>
</tbody>
</table>
Concept map analysis

Concept map Produced by Batch 2
## Evaluation of IPA

(Individual process assessment)

Concept Map analysis  Novaks Method

<table>
<thead>
<tr>
<th>Particular</th>
<th>Study Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘n’</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Geometric Mean (of marks based on structural method)</td>
<td>82.7370</td>
<td>73.9605</td>
</tr>
<tr>
<td>G.S.D.*</td>
<td>1.5635</td>
<td>1.5045</td>
</tr>
<tr>
<td>‘t’ value, P value &amp; Statistical Significance</td>
<td>1.2836, 0.2024, Not Significant</td>
<td></td>
</tr>
<tr>
<td>Mann-Whitney test statistic, P value &amp; Statistical Significance</td>
<td>921.5, 0.0906, Not Significant</td>
<td></td>
</tr>
</tbody>
</table>

- G.S.D. = Antilog of S.D. of log transformed marks
Develop a good relationship with my teachers
Ability to accept and work with students of different background.
Better interpersonal skills
Sharing knowledge with my colleagues
I have better skills of gathering and organizing information
Valuable learning activity
Discussing more with others than after a lecture
Trained me in self learning skills
Increased satisfaction with the course
Developed positive attitudes towards medical education
CBL method of education is interesting
Improved my clinical competence
Improved my clinical reasoning skills.
Faculty Feedback On Perception of CBL

Teaching is facilitated
Awareness about the teaching in other and related subjects
Endorses this new teaching program for other clinical branches
This model adopted is worth trying in other clinical branches
Student-teacher interaction has improved
Endorse this method of teaching for MBBS Course
Thank you for patient listening!!