

# **Problem-Based Learning**

**By**

**Dr. Said Said Elshama**

**Professor of Forensic Medicine and Clinical Toxicology**

**Medical Education (DHPE)**

**College of Medicine - Taif & Suez Canal University**

# Introduction

# New Principles of Medical Schools Development

Credit Hour Policy

Integrated Organ/System  
Curriculum



# Directions of Integration

## 1- Horizontal Integration:

The integration within basic science subjects or within clinical science subjects of the curriculum.

## 2- Vertical Integration:

The integration between the basic and clinical science sections of the curriculum.

## 3- Spiral integration: (Ideal Form)

It is a combination of both horizontal and vertical.

- **First spiral** : (1st “2-2.5 years”)  
Basic science (70 %) clinical science (30%)
- **Second spiral**:  
Clinical science (70%) and basic science (30%)

# Phases of integrated system

## 1- The first phase - foundation “1 year”

Introduction to the basic medical information

## 2- The second phase “2 years”

It is an organ system modules, applies the basic knowledge to the study of clinical disease.

## 3- The third phase “2 years”

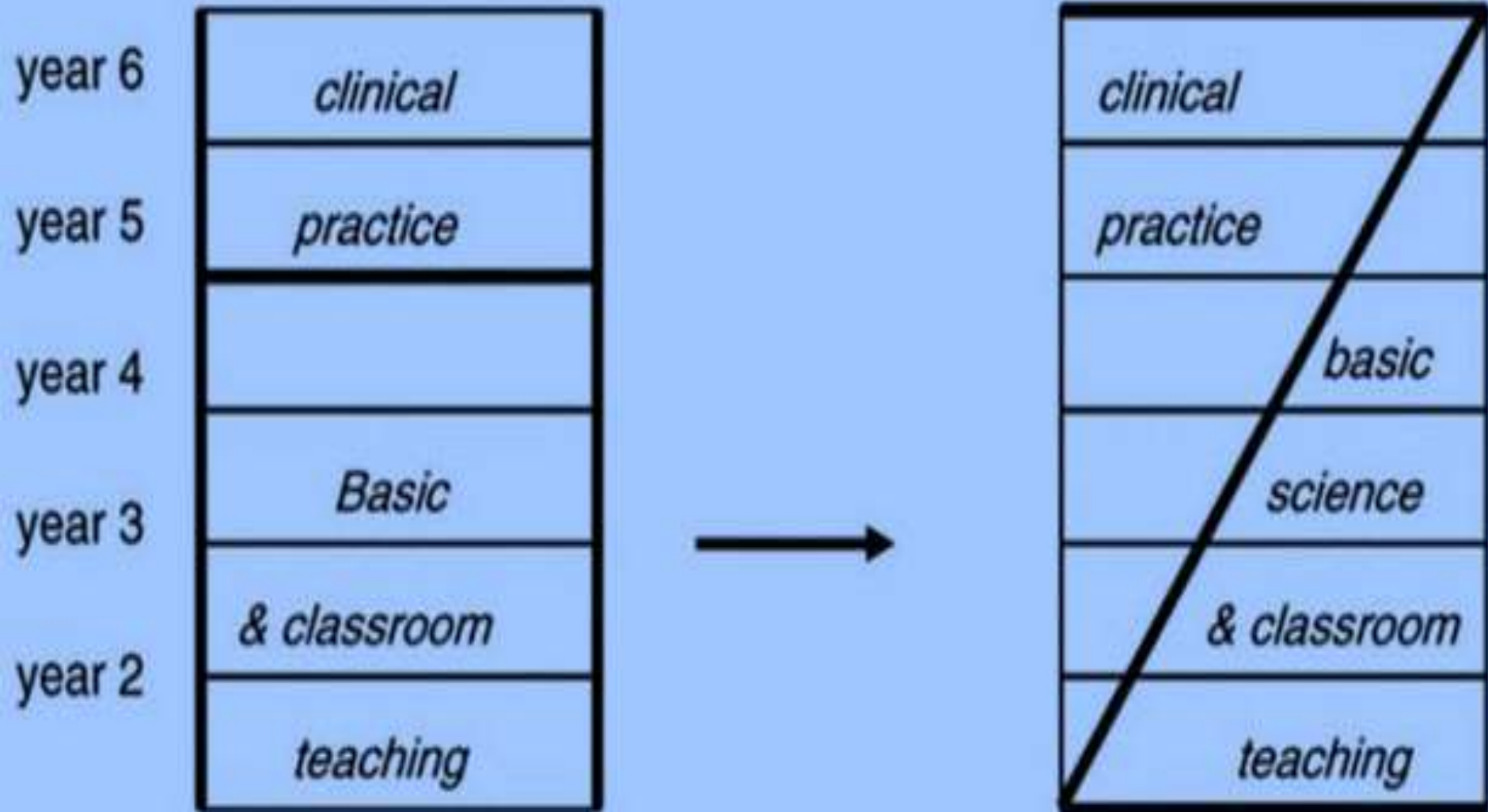
It is devoted to clinical aspect.

## 4- Longitudinal Curricular Themes (courses)

It runs within multiple modules (Ethics, Medical Nutrition and Patient Safety) .

## 5- Internship

# 'H' shaped curriculum is converted into 'Z' shaped curriculum



# Credit Hours System

- Credit hours of the course depend on the unit of the semester credit hour.
- Semester credit hours are based on contact hours.
- Contact hours are the spent time of student with an instructor whether face-to-face or virtual.
- A semester is 15 weeks of instruction + one week for final examinations.
- There are obligatory, elective and pre-requisite courses - university and college requirements.
- Academic monitoring.
- Registration, addition, deletion, withdrawal, postpone

**Innovative Curricula**

**VS**

**Traditional Curricula**

**Student-centered**

**Teacher-centered**

**Problem-based**

**Information gathering**

**Integrated**

**Discipline-based**

**Community-based**

**Hospital based**

Define learning outcomes for module

How will individual outcomes be achieved?

Clinical skills

Lectures

PBL

Communication skills

Practicals

How many PBL sessions in the module?

Write learning objectives for each PBL

Write PBL scenarios

Write tutor notes

Pilot with staff

Refine scenarios and tutor notes

Pilot with group of students

Design timetable for module;  
write module handbook for students

Implement module

Evaluate

**Designing and implementing a curriculum module using PBL supported by other teaching methods**

## ***PROBLEM-SOLVING***

**MAKE A DECISION BASED ON PRIOR KNOWLEDGE  
AND REASONING**

## ***Problem-based learning***

**Acquiring new knowledge based on  
recognition of a need to learn**

	<b>PROBLEM SOLVING</b>	<b>PROBLEM-BASED LEARNING</b>
<b>Role of the Teacher</b>	<b>Content expert</b>	<b>Tutor</b>
<b>Learning Environment</b>	<b>Passive, teacher-centered</b>	<p><b>Learning is dependent upon the self-directed efforts of the small group.</b></p> <p><b>It creates an active, student-centered learning environment</b></p>
<b>Who is responsible for directing the learning activities</b>	<b>Teacher</b>	<b>The student decides what he needs to learn</b>

# **Problem Based Learning**

## **PBL**

### **Rationale**

- The most practical and efficient way of learning.**
- It is used in our daily professional and personal lives.**
- Learning is a dynamic process, not static.**
- Develop a life-long learning attitude.**
- Develop group and interpersonal skills.**

# Components of Problem Based Learning

## Small Group

- Non-Threatening, Co-operative Atmosphere
- Tutor's Role: Facilitative and Supportive
- Open Feed-Back to Each Other about Performance

## Self-Directed

- Active, independent, self-directed learning
- You learn what you need
- Building of new knowledge on existing knowledge
- Learn to use different resources
- Learn time-management skills
- Take responsibility for one's learning

## Problem-Based

- The use of realistic (e.g. clinical) problems
- Emphasis is not on solving the problem
- Hypothesis and issue generation
- Develop ability to identify, formulate, and solve problems
- Grasp and use basic concepts and principles, to gather and assess data rigorously and critically

# Advantages

- Integration and application of knowledge (problem-solving)
- Building of new knowledge on existing one (depth)
- Development of other skills (e.g. inquiry , critical appraisal, communication, group)
- Motivation to learn is self-imposed
- Life-long learner
- Wide coverage of the topic (big picture)

# **Disadvantages & Challenges**

- Some staff members are resistant to change**
- Students are not mature enough to handle this**
- It consumes too much time in a tutorial (talking)**
- It needs more facilitators**
- It needs too much work**
- It is not enough to cover the basic sciences**
- The lack of depth in the acquired knowledge**

# **PBL ( International Trend)**

**Britain, Australia, Switzerland, Sweden,  
Netherlands, Malaysia, Indonesia, Hong  
Kong, Taiwan, Philippines, Bahrain,  
Brazil, Chile, Egypt, Nigeria, KSA**

**U.S.A**

**New Mexico, Michigan State, Harvard ,  
Southern Illinois**

# **The key Steps of PBL Process**

- **It consists of a small number of students (ideally 6-10).**
- **It is facilitated by one tutor who guides the process without contributing directly to the solution of the problem or being the primary source of information.**
- **Completing a case in two sessions.**
- **Session two times per week for 2 to 3 hours per session.**

# **Key Steps in the PBL Tutorial Process**

- 1. Case presentation**
- 2. Identifying key information**
- 3. Generating and ranking hypotheses**
- 4. Generating an enquiry strategy**
- 5. Defining learning objectives**
- 6. Reporting back**
- 7. Integrating new knowledge**

All participants have role to play

Scribe

- Record points made by group
- Help group order their thoughts
- Participate in discussion
- Record resources used by group

Tutor

- Encourage all group members to participate
- Assist chair with group dynamics and keeping to time
- Check scribe keeps an accurate record
- Prevent side-tracking
- Ensure group achieves appropriate learning objectives
- Check understanding
- Assess performance

Chair

- Lead the group through the process
- Encourage all members to participate
- Maintain group dynamics
- Keep to time
- Ensure group keeps to task in hand
- Ensure scribe can keep up and is making an accurate record

Group member

- Follow the steps of the process in sequence
- Participate in discussion
- Listen to and respect contributions of others
- Ask open questions
- Research all the learning objectives
- Share information with others

Roles of participants in a PBL tutorial

# How to Moderate PBL in Class

**Problem Identification**



**Hypothesis Generation**



**Generation of Learning Issues**



**Inquiry Strategy:  
Setting of Group and Personal Objectives**



**Revisiting the Problem, Sharing of Information**

**(Debriefing)**

# How to Manage PBL?

## Tutor Role

- Emergence of Group Leader
- Rotation of Leadership Role
- Balance between Vocal and Quiet Members
- Conversion of a Group into a Team
- Equal participation and equal responsibilities
- Separation of Personal vs. Group Objectives
- Resolution of Conflicts
- Value Other Group Members' Opinions
- Supportive and Facilitative of each other's learning
- Free sharing of information
- Constructive Evaluation of Self and Group



## Generic skills and attitudes

- Teamwork
- Chairing a group
- Listening
- Recording
- Cooperation
- Respect for colleagues' views
- Critical evaluation of literature
- Self directed learning and use of resources
- Presentation skills

# How does Problem-Based Learning work?

## Instructor:

- Develop real-world, complex and open-ended **problem** such as might be faced in the workplace or daily life.
- Act as facilitator, making sure students are staying on track and finding the resources they need.
- Raise questions to student groups that deepen the connections they make among concepts.
- Strike a balance between providing direct guidance and encouraging self-directed learning.

## ❖ **Students :**

Address the problem, identifying what they need to learn in order to develop a solution and where to look for appropriate learning resources.

Collaborate to gather resources, share and synthesize their findings, and pose questions

# Examples of trigger material for PBL scenarios

- Paper based clinical scenarios
- Experimental or clinical laboratory data
- Photographs
- Video clips
- Newspaper articles
- All or part of an article from a scientific journal
- A real or simulated patient
- A family tree showing an inherited disorder

## **Develop problems that:**

- أ- Capture students' interest by relating to real-world issues.
- ب- Draw on students' previous learning and experience.
- ت- Integrate content objectives with problem-solving skills.
- ث- Require a cooperative, multi-staged method to solve.
- ج- Necessitate that students do some independent research
- ح- to gather all information relevant to the problem.

## **Design assessment tools that:**

- أ- Account for process (e.g. research, collaboration) as well as content skills.
- ب- Are closely tied to course learning objectives.
- ج- Balance individual and group performance.

# Scenario

Mary Smith, a 28-year-old office worker and part-time swimming instructor, comes to see her GP because of pain in her chest and shortness of breath. This has been a recurring problem in recent months and seems to be gradually worse. On the previous evening, while participating in a swimming gala, she became so short of breath that she found it difficult to walk.

# How to Create Effective PBL Scenarios

- Learning objectives likely to be defined by the students after studying the scenario should be consistent with the faculty learning objectives
- Problems should be appropriate to the stage of the curriculum and the level of the students' understanding
- Scenarios should have sufficient intrinsic interest for the students or relevance to future practice
- Basic science should be presented in the context of a clinical scenario to encourage integration of knowledge
- Scenarios should contain cues to stimulate discussion and encourage students to seek explanations for the issues presented
- The problem should be sufficiently open, so that discussion is not curtailed too early in the process
- Scenarios should promote participation by the students in seeking information from various learning resources

# Scenario

**A 25-year-old female patient came to OPD complaining of right sided loin pain and red urine for 4 days with discomfort and pain during urination.**

**On examination**

**BP: 130/80 mmHg, pulse: 90b/m, temp: 37C.**

**Abdominal examination was normal.**

# Checklist For Problem Construction

- Is the content of the problem geared to students' prior knowledge?
- Is there a clear connection with one or more of the objectives of the block?
- Is the problem sufficiently complex to offer cues for initial discussion and for generating learning issues?
- Is the problem structured in such a way that it offers cues for discussion in the group?
- Has the problem been formulated clearly and, if possible, does it offer links with professional practice?
- Is the problem multidisciplinary and is clear to students?
- Does the length of the problem enable inclusion of all the relevant information that is needed for identifying learning issues and does the problem not contain superfluous irrelevant information?
- Is the available time sufficient for studying the learning issues?
- Is there sufficient time available for reporting on all the learning issues?
- Does the block offer sufficient variety in learning activities, i.e. does it include different types and formats of problems?
- Is the number of problems geared to the number of group meetings in the block? Has a schedule been drawn up that specifies which problems are to be discussed when?
- Which problems should be tackled in a specific sequence?

**Thank you**