



**Using Problem-based Learning as an Instructional Pedagogy:
Innovation or Conundrum: September 18, 2009**

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University of Oklahoma Health Sciences Center
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Education Grand Rounds

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Learning as an Instructional
Pedagogy:**

Innovation or Conundrum?

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Higher Order Learning in Education

- **Key Elements**
 - **Active/Interactive process resulting in...**
 - **Meaningful, and...**
 - **Long-lasting changes...**
- **in knowledge, skills, and/or attitude (behavior).**



Higher Order Learning

- Memorizing and repeating are lower levels of learning cognition.
- Analyzing, synthesizing, evaluating and applying are higher levels of cognition.
- Teaching and evaluation should reflect learning at the higher levels.



Curriculum Diseases



How many of these symptoms have you seen?

Insufficient emphasis on developing:

- critical thinking skills,
- critical reading,
- skilled searcher and evaluator of literature,
- life-long learner
- Curriculum failing to meet the needs of the marketplace
- Exams driving the curriculum
- No more 'room' in the curriculum



- Trying to teach too much to students.



- Poor attendance at lectures
- Predominance of 'recorders'.



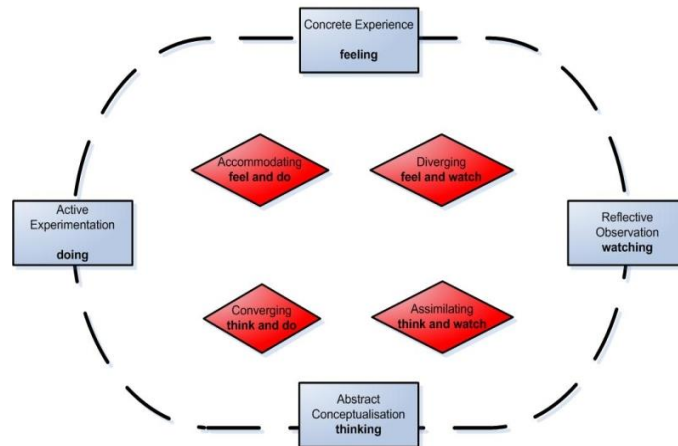
More symptoms of an unhealthy curriculum!

- Students memorizing lists
- Exam 'cycling'
- Library is used primarily for socialization
- Dependence on textbook information.



Philosophies for Learning

Kolb's Learning Styles Diagram:



Cognitive diversity leads to superior quality group work.

J.E. Miller

- Good teaching practice respects diverse talents and ways of learning.

Visual
Auditory

Tactile



Guiding Principles

- Individuals do not have to be taught everything they learn.
- A curriculum should reflect the integrated thinking and planning of the faculty.
- Integration should not be left entirely to the students.

Guiding Principles

- Students should be aware of what they are to master
- Students do not learn by the hour: time for reflection and consolidation
- It is not necessary to learn the universe of facts in order to understand and apply concepts
- It is more effective to stretch minds than to stuff them

Tools



Tools



- Lectures (large & small group)
- PBL/CBL (small group)
- Laboratories
- 'Sims'
- Simulated patients
- Computer-assisted instruction
- Computer modeling
- Clinical experiences



Remedies





"And so you just threw everything together? ...
Mathews, a posse is something
you have to organize."



***"Thinking means connecting
things, and stops if they cannot be
connected"***

C.K. Chesterson

New information must be meaningfully
connected to prior knowledge, and it
must first be remembered in order to
be learned.



- Base units of curriculum on systems
 - Content achieved by basic & clinical faculty
 - Identify & develop key concepts
 - Provide experiences for clinical affirmation
- Develop fundamental database of structure & function
- Application of strategies across systems



- Develop problem-solving strategies
- Shift from lecture (passive learning) to problem solving (active learning)
 - *Active learning occurs when students invest physical and mental energies in activities that help them make what they are learning meaningful*
- Decrease the amount of 'rote' information presented
 - *Become a 'guide by the side' rather than a 'sage on the stage'.*



- Emphasize acquiring information from various data bases, and evaluating it
 - Textbooks
 - Monographs
 - Primary literature
 - Multiple sources
- Synthesizing, integrating, testing, implementing - Critical Thinking
- Devise methods of evaluation that complement the learning pedagogy



Evaluation

“There are three kinds of men. The one that learns by reading. The few who learn by observation. The rest of them have to pee on the electric fence for themselves.”

Will Rogers

Improve learning by making sure your method of evaluation requires the kind of thinking and learning you wish to promote,

and promotes what the student wants to know.



Evaluation



- Formative
 - Procedural behavior
 - Group interaction
 - Individual skills & behavior
 - Information acquisition & integration
 - Information understanding
 - Professionalism



Evaluation



- Summative
 - Cognitive Evaluation:
 - Knowledge base (Scenario based MCQ)
 - Problem solving (open book)
 - Facilitator/mentor evaluation



Familiarity Breeds Confidence

- Using PBL as a technique for learning
 - Working towards solution of a problem
 - Resulting in understanding of information
- A process of learning conceptual & factual information in a 'contextual' setting
- Integrative, rather than discipline-based
- Correlating with 'real life' situations
- Strengthening with 'traditional' pedagogy.



Foundation of PBL

- In Small Groups
- Student Interactive
 - (Student directed)
- Uses teacher as a manager or 'facilitator'
- Uses 'real' problems to solve!



What is the Student's Role?

- An actively engaged student will:
 - define what 'you' want to know.
 - work with the team to problem solve
 - apply knowledge to a realistic situation
 - interact interprofessionally
 - share intellectually



PBL Facilitators

- Directs and Watches Group Discussion
 - Stimulates using thoughtful questions
 - Allows free expression by participants
 - Invites participant process...
 - AND feedback (formative evaluation)!
 - evaluates hypotheses by comparing them to data (using scientific method),
 - utilize knowledge in a relevant manner
- Keeps the group focused on its goal



During Problem Solving, How is Information Gained?

- Information is gained by students making their own decisions!
 - Learning by making correct decisions, and
 - Learning by making incorrect decisions!
 - Learning by researching and sharing the information in which more knowledge is needed to make informed decisions.



Barriers



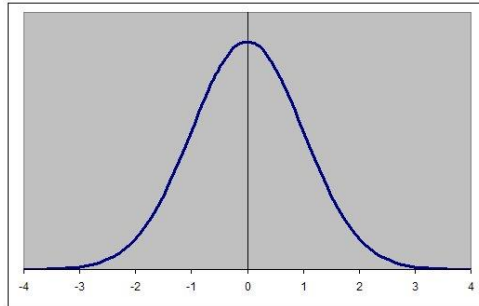
- Faculty issues:
 - ‘If I don’t tell them, they won’t learn it!’
 - ‘Hell no, we won’t go!’
 - ‘Intellectual bullemia’ & checklists
 - ‘But **that** isn’t what I lecture about’
 - The ‘Trowel Club’



- Efficiency issues
 - Small groups and workforce
 - Classroom time
 - Case development
 - Evaluation methodology



Where is the 'conundrum!





- Scores on standardized exams
- Inquiry
- Problem solving
- Information acquisition, evaluation & integration.



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