

LONGITUDINAL EVALUATION OF MD STUDENT PROGRESS AT MCMMASTER

"the best laid plans....."

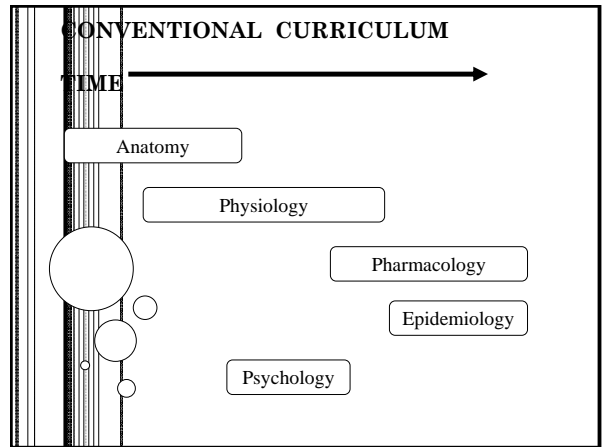
IAMSE Web Audio seminar. Oct 1, 2008

MCMMASTER PBL VERSION 3.0

Dr Alan J. Neville
Ozzawa Conference March, 2008

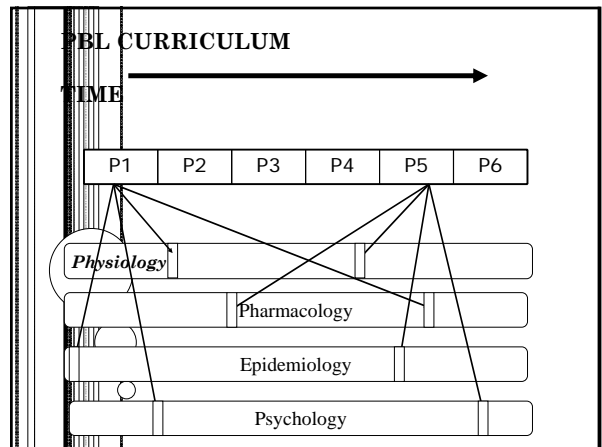
OBJECTIVES

- Understand Curriculum changes at McMaster
- Understand rationale for a longitudinal approach to student evaluation
- Understand unanticipated consequences of the evaluation process
- Appreciate how as dogged curriculum planners we have mused about Complexity Theory to explain our inability to predict these same consequences!!!!



LEARNING AND MEMORY

- From Cognitive Psychology
 - Learning = integrating new knowledge into existing structures
 - With PBL, learning may occur in 2-20 domains
 - Opportunity for integration low



PROBLEM CONTEXT = TRANSFER?

The thesis:

If a student has learned a concept in a problem context, this will ensure that he will be able to use it to solve other problems

It's appealing

It's wrong!

TRANSFER AND CONTEXT SPECIFICITY

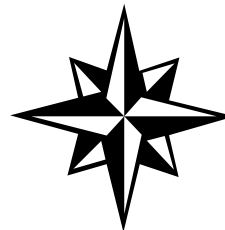
- The initial solution is learned in, and stored with the problem context.
- To solve the new problem, must recognize that the old problem was analogous to the new, despite different contexts
- To recognize analogy, we must recognize similarity in deep structure

this rarely happens.....

CONCLUSIONS -- PRECLINICAL

- PBL alone does not guarantee that concepts can be learned and used
- Learning impeded by organ system, multi-discipline organization
 - Need to more carefully sequence concepts
- Transfer impeded by learning in single problem
 - Need opportunity for deliberate practice with multiple problems

COMPASS CURRICULUM A NEW DIRECTION FOR THE NEW MILLENNIUM

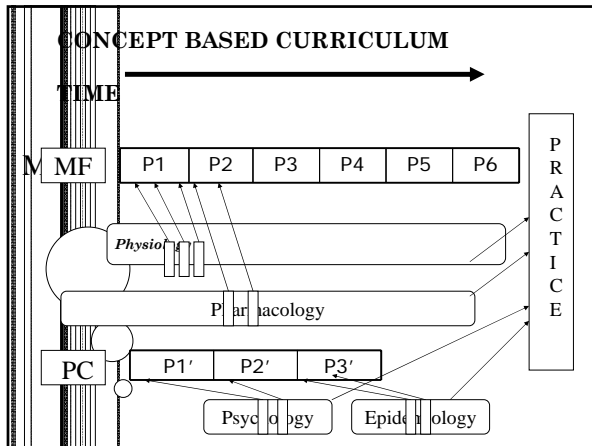


COMPASS CURRICULUM

- Concept-oriented
- Multidisciplinary
- Problem-based
- Practice for transfer
- Simulations in clerkship
- Streaming

INTEGRATION OF CONCEPTS

- Each curriculum unit based on growth of important concepts
- Problems selected to illustrate concepts, clinical correlates
- Exploration of problems directed at "why?" questions



- ### 12 OVERRIDING CONCEPTS
1. Oxygen delivery and exchange
 2. Metabolism of drugs
 3. Energy balance
 4. Salt and Water balance
 5. Movement control
 6. Interacting and communicating
 7. Host defense
 8. External and internal awareness
 9. Human development
 10. Reproduction
 11. Anatomy structure
 12. The Population Perspective

CURRICULUM OUTLINE

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	
1	PROFESSIONAL COMPETENCIES								ORIENTATION	MEDICAL FOUNDATIONS 1 INTRODUCTION TO DETERMINANTS OF HEALTH AND LIFE CYCLE CARDIORESPIRATORY			VACATION
2	INTERDISCIPLINARY	MEDICAL FOUNDATIONS 2 HOMEOSTASIS I ENERGY BALANCE (GL, ENDO, NUTRITION)		INTERDISCIPLINARY	MEDICAL FOUNDATIONS 3 HOMEOSTASIS II RENAL, ACID-BASE, BP REPRODUCTION AND PREGNANCY GENETICS I		INTERDISCIPLINARY	MEDICAL FOUNDATIONS 4 HOST DEFENSE NEOPLASIA GENETICS II		ELECTIVE	VACATION	INTERDISCIPLINARY	
3	PROFESSIONAL COMPETENCIES								ORIENTATION	MEDICAL FOUNDATIONS 5 MOVEMENT CONTROL INTERACTING AND COMMUNICATING			VACATION
4	PROFESSIONAL COMPETENCIES												
5	CLERKSHIP (2 weeks vacation sometime in June/July)												
6	PROFESSIONAL COMPETENCIES												
7	ELECTIVE	CLERKSHIP		SYM + LMC LECTURES								ELECTIVE	

PROFESSIONAL COMPETENCY CURRICULUM

- ### PILLARS
- Competency Based
 - Portfolios/Learning Plans
 - Longitudinal
 - Integrated
 - Problem-Based
 - Interprofessional

- ### PROFESSIONAL COMPETENCY DOMAINS
- Effective Communication
 - Professionalism and Role Recognition
 - Self Awareness and Self Care
 - Lifelong Learning
 - Social and Community Context of Health Care
 - Moral Reasoning and Ethical Judgment
 - Clinical Examination

COMPLEX ADOPTIVE SYSTEMS

“A complex adaptive system consists of a large number of agents, each of which behaves according to its own principles of local interaction. No individual agent, or group of agents, determines the patterns of behaviour that the system as a whole displays, or how these patterns evolve, and neither does anything outside the system.” (Stacey et al 2000 p. 106)



PROPERTIES OF COMPLEX ADAPTIVE SYSTEMS (CAS)

- Defined in terms of connections and patterns of relationships
 - Can be understood by examining network as a whole – not individual agents
 - CAS's are “emergent” – order emerges without the need for hierarchical control
 - CAS's are self-organizing
 - System trajectory over time is unknowable; but events are not random and may be unique, yet patterned.
 - CAS's operate in a way that appears illogical or paradoxical
- Anderson and McDaniel 2000



MEDICAL EDUCATION PROGRAMS AS COMPLEX ADOPTIVE SYSTEMS

- They consist of human agents who make choices about their actions
- They have hierarchical structures and networks
- System behaviour is patterned and also unpredictable
- Programs exist within wider systems which they both influence and are influenced by
- No individual or group determines the systems' pattern of behaviour

P. Tosey. May 2002



STUDENT EVALUATION IN COMPASS

Concept Application Exercise (CAE)

18-20 short answer clinical vignettes
Students tested to “explain” the features, results or clinical phenomena
Questions resemble mini-tutorial cases



UNINTENDED CONSEQUENCES OF CAE

CAE perceived as “final exam”—no attention is paid to Integration curriculum in the days following the CAE
SO---where to place Integration week and the CAE?

Self-organizing

Possibly a paradox



CAE-MD PROGRAM'S RESPONSE

- No longer placed at end of curriculum block
- Students answer 3-4 questions every 2-3 weeks
- Content of question items integrates cumulatively over course of curriculum
- Tutor gets a longitudinal assessment of student progress



PROGRESS TESTING

- Developed first at UM-KC and Maastricht
- Introduced at McMaster in 1991
- Students have to acquire information continuously in a way that it becomes available when required; students cannot “revise” for the test.



PERSONAL PROGRESS INDEX (PPI)

180 item MCQ, three times per year.

All classes sit same exam – items cover all domains of Medicine. Student scores norm-referenced to own class – and zone-scored in standard deviations from class mean.



UNINTENDED CONSEQUENCES OF PPI

Students in some years bought “cramming” review texts to get a “leg-up” in domains they had not yet covered in the curriculum – YET

- Scores are not ranked
- A green zone is a green zone is a green zone!!!!

Emergence and Paradox



PPI-MD PROGRAM'S RESPONSE

- Orientation-Orientation-Orientation!!!!!!



LONGITUDINAL ASSESSMENT AND STUDENT BEHAVIOUR

- If the “test” is at the end of the block, it's an end of course exam, right?
- So it's norm-referenced, but what can I do to get the best mark?



UNINTENDED CONSEQUENCES OF PROFESSIONAL COMPETENCIES CURRICULUM

“We don't need to address that patient's behavioral issue in tutorial today, we'll talk about it in PC.”

Emergence and Paradox

Every educational action is also an act of “governance”.

Tosey 2002



CRITICAL THINKING PORTFOLIO

- Objective 1. Learn and Practise the discipline of noticing what you are thinking and experiencing
- Learn from locating your own thinking and experience within that of others
- Continued inquiry rather than coming to a conclusion.



CRITICAL THINKING PORTFOLIO-2

- Step 1-Identify a guiding question
- Step 2-Gather different forms of response to the question
- Step 3-Create summary statement demonstrating a coherent thread among the responses over time –including movement in thinking since question first asked
- Portfolio Review



CONCLUSIONS OR CONSEQUENCES

- There's much more than learning theory driving our curricula
- Curriculum planners can be end-run by the evaluation system
- Evaluation systems need good psychometrics, but also need flexibility to adapt
- Never underestimate how our students will respond to the challenges of evaluation.

