This is Problem-based Learning

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Outline

- Introduction to Problem-based Learning (PBL)
- Experience PBL
- Reflections on the process

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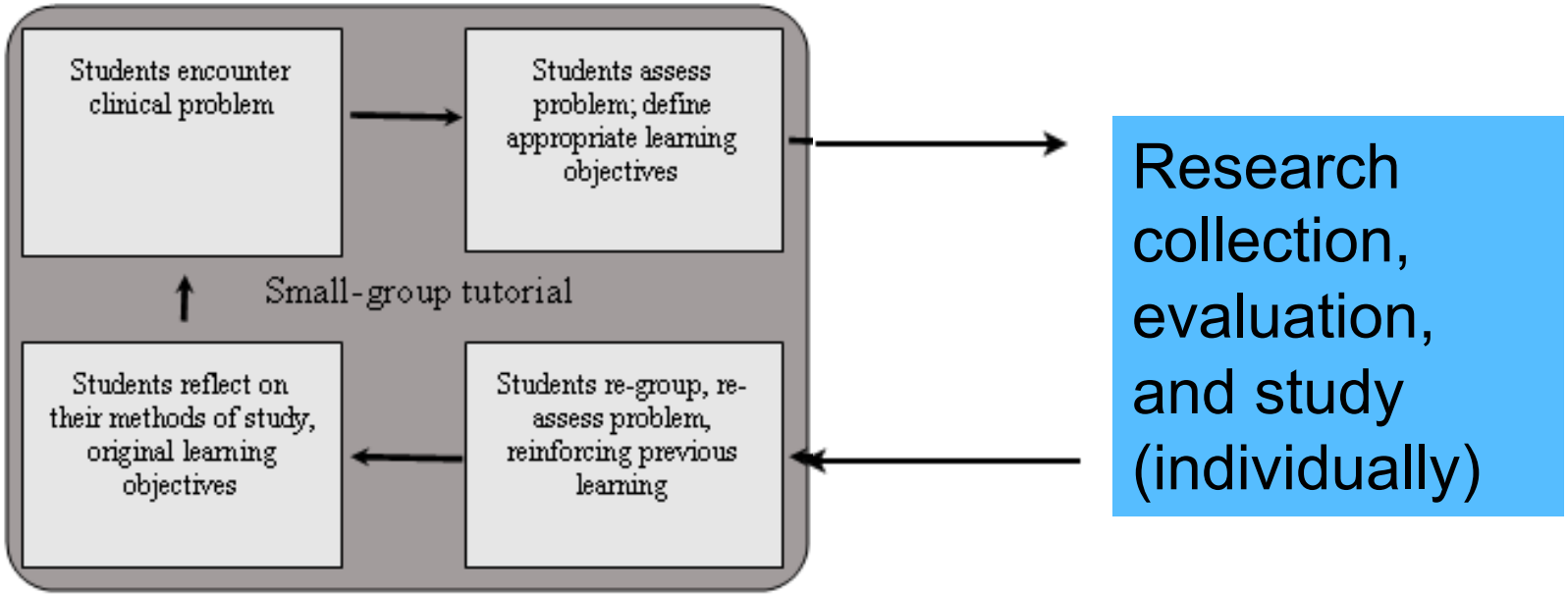
Personal background

- Student in post-baccalaureate Doctor of Pharmacy program at University of Toronto:
  - Full therapeutics curriculum was delivered using PBL
- PBL tutor for the Faculty of Medicine, McMaster University
  - Vast majority of curriculum delivered using PBL
- Course developer and coordinator for PHARM 422 (Advanced Therapeutics)
  - Fourth-year course at School of Pharmacy taught with closed-loop PBL

Important caveat...

- When I use the term PBL, I am referring to closed-loop PBL (the McMaster form)



Adapted from "Approaching PBL practically" http://fhs.mcmaster.ca/facdev/documents/ApproachingPBLPracticallySept.08.pdf

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The origins of PBL

- Harvard
- McMaster

Problem-based learning

- A problem is the stimulus to guide the student's learning

Students will:

1. Identify their learning needs (what do they know, what don't they know)
2. Utilize resources to address deficiencies in knowledge (e.g. primary literature, guidelines)
3. Critically appraise and apply information
4. Develop skills that enable them to be highly effective team members

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Problem-based learning: Why

- Student engagement
- May improve knowledge retention and improve self-directed learning skills
- Graduates tend to have superior cognitive and social skills
  - E.g. coping with uncertainty
- It bears a striking resemblance to real life
  - Patient issues are often ill-defined, information is frequently updated, health care is practiced in team environments

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Koh GC *et al.* CMAJ 2008;178:34–41

Problem-based learning: How

- Key elements:
  - Small-groups (8 or fewer students)
  - Problem (the case)
  - Protected time in the curriculum for self-study (4-6 hours per week)
  - Tutor

Problem-based learning

Steps in the PBL process:

1. Identify the problem
2. Explore pre-existing knowledge
3. Generate hypotheses and possible mechanisms
4. Identify learning issues
5. Self-study **(outside of tutorial)**
6. Re-evaluation and application of knowledge to the problem
7. Assessment and reflection on learning

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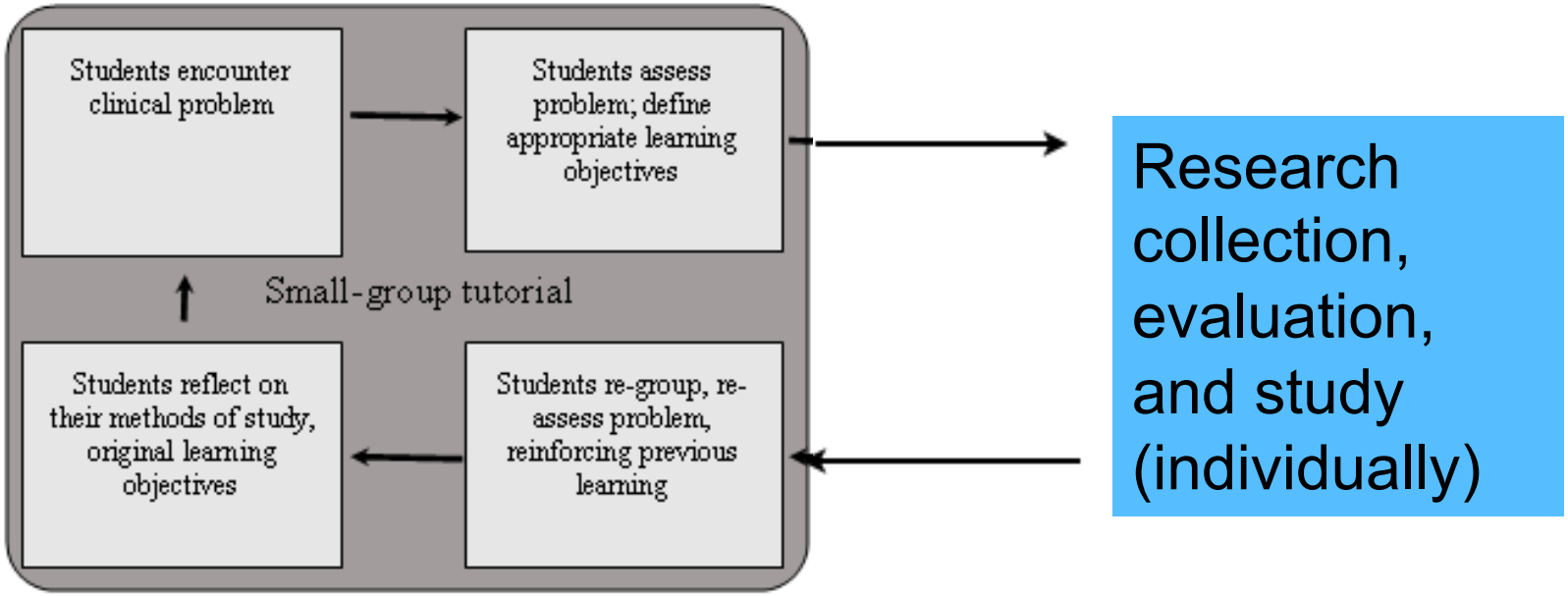
Closed-loop PBL

- a.k.a. the McMaster form



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Learning objectives

- Provide framework for learning about the case
- Help to guide self-study and to discuss the case in tutorial
- Challenge:
  - Shouldn't be too specific (limits your ability to explore concepts of interest to you)
  - Shouldn't be too broad (may be unable to complete in time for the tutorial)

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Learning objectives

Step 1 – **Identify and clarify unfamiliar terms** presented in the scenario; scribe lists those that remain unexplained after discussion.

Step 2 – **Define the problem or problems to be discussed**; students may have different views on the issues, but all should be considered; scribe records a list of agreed problems.

Step 3 – **"Brainstorming" session to discuss the problem(s), suggesting possible explanations on basis of prior knowledge**; students draw on each other's knowledge and identify areas of incomplete knowledge; scribe records all discussion.

Step 4 – **Review steps 2 and 3 and arrange explanations into tentative solutions**; scribe organizes the explanations and restructures if necessary.

Step 5 – **Formulate learning objectives**; group reaches consensus on the learning objectives; tutor ensures learning objectives are focused, achievable, comprehensive, and appropriate.

Task: In your groups...

1. Read the case aloud
2. Clarify and agree upon working definitions and unclear terms and concepts
3. Define problems; agree which phenomena need explanation
4. Analyze the problem (brainstorm) using existing knowledge
5. Arrange possible explanations and working hypotheses
6. Generate learning objectives
7. Identify possible resources

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Reflections

- “Students”
- Tutors

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If you were actual students...

- You would be provided with adequate time in the curriculum to ***independently*** research your learning objectives
  - I would allow 4-6 hours for this case
  - This will require searching for, retrieving and critically appraising information from tertiary (textbooks), secondary (review articles), and primary sources of evidence
- You would then meet again as a group for the tutorial...

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Sample tutorial schedule

15:30 to 17:15 - discuss learning objectives

17:15 to 17:30 - break

17:30 to 17:45 - “back to the case”

17:45 to 18:10 - develop learning objectives for new case

18:10 to 18:20 - assessment/reflection

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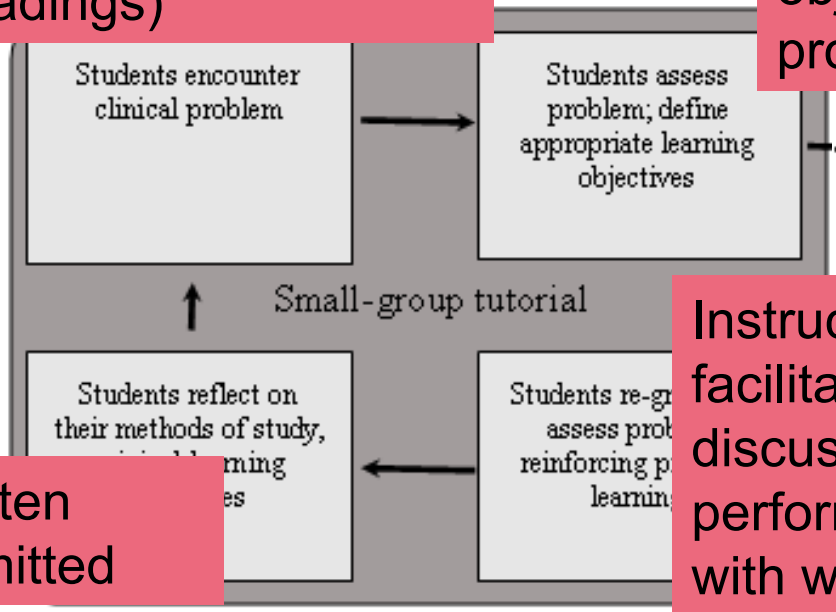
Modifications to PBL
(for illustration purposes, not endorsement!)

Information provided to students: (Lecture, readings)

Learning objectives provided

Insufficient time provided for research and analysis; performed in groups versus individually



Re collection, evaluation, and study (individually)

Instructor facilitated discussion; performed with whole class versus small group

Often omitted

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Questions?

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