Medical Education Research at McMaster University

Kelly Dore, PhD
Program for Educational Research and Development
Director, MSc of Health Science Education
Objectives

• A little about me

• What is PERD?

• What is Education Research?

• What types of research are we doing?

• Where can you get help?
My Background

• PhD in Health Research Methodology
  – Medical Education & Cognitive Psychology

• Hired by Clinical Departments to support Educational Research projects & activities

• Senior Scientist in PERD - funded to support Educational Activity & research in FHS
Quality of education programs rests upon careful consideration of the best available evidence.

Dedicated to:

- the advancement of research and scholarship in health sciences education
- the application of knowledge gained from educational scholarship to the teaching and learning
PERD

Encouraging the development of both Theory-based (curiosity) and Application-based (practical) research in FHS

Doing both is important in order to advance the field and our understanding
Curiosity Driven Research

• Historically we wanted to make people better problem solvers
  – RCT on PBL vs. Didactic
• Look more fundamentally at the mechanism behind this action
• Everyone uses the hypothetico-deductive model
  – Generate multiple hypothesis with minimal data & then gather data
• Experts have better hypotheses
  .......ok......
• Organization of knowledge in reasoning & how people generate hypotheses
Some of the things we learned

• Clinical reasoning is based on both analytical facts and relationships and an accumulation of examples

• As one becomes more expert in an area, greater reliance on examples

• Instruction to explicitly use both, especially for students is more effective than either alone
Practical Research
Evolution of PERD

Levels of involvement:

- Senior Scientists
- Scientists
- Scholars
- Fellows
PERD Scientist

- Educational Researchers...
- Generally PhDs who are interested in Medical Education Research
- Senior Scientists are hired in whole or part to be members of PERD and support FHS – Geoff, Lawrence & Myself
PERD Scholar

• People with an interest in Medical Education who are engaged in research or BEME practice

• Scholars:
  – have access to PERD & Online resources
  – will be invited to various educational initiatives

• Membership is *free* & easy
PERD Fellows

• People who are engaged in an educational program (Masters or PhD) with a focus on educational research

• Including those in the new Masters of Health Science Education Program.....
Masters of Health Science Education

• Starting September 2013

• An online Inter-professional Program designed to create a “Culture of Curiosity” and facilitate the development and implementation of the Best Evidence in Medical Education

• Combination of in-person residency, online core & elective courses
Masters of Health Science Education

- Courses to include:
  - Cognition and Curriculum
  - Research Methods
  - Assessment and Evaluation
  - Simulation
  - Skills Acquisition
  - Leadership

- Full and Part-time options
- Thesis & Scholarly paper
Educational Scholarship

• Best Evidence in Medical Education
• “the dissemination of information which allows medical teachers, institutions and all concerned with medical education to make decisions on the basis of the best evidence available”
• High fidelity simulators, assessment measures, faculty development, interprofessional education, portfolios, self assessment etc.
Educational Research Projects

• Small Questions can lead to big change....
• Thinking about why we do things in our everyday practice
• What are the problems you face, how can we think about the problem differently in order to find a solution
Survey Development

• Survey Design
  – Content Development
  – Reliability & Validity Analysis

• Survey Administration
  – Lime Survey
  – Data Summaries
Survey Design

• Student Advisor program

• National Survey of PG program in Pediatrics

• Resident Portfolio satisfaction

• Faculty survey re curriculum content
CaRMS Portfolio Evaluation Tool

- All CaRMS submissions to the Obstetrics & Gynecology Program at McMaster University

- Each portfolio was independently scored 10 pt Likert Scale by 2 faculty and 2 residents
  - 19 items across 4 domains
  - Overall Candidate score
  - Capacity to identify any “Red Flags”

- Initially each evaluator independently reviewed approximately 10 portfolios to establish their benchmark
Results

Inter-Rater Reliability
• Within Levels 0.93
• Between Levels 0.58

Overall Scores
• Resident mean: 6.6/10
• Faculty mean: 7.6/10 (p=0.001)
Improving the CaRMS interview (2008 & 2009)

- 7 Stations + a Personal Interview
- MMI was used to select residents during the CaRMS process

Internal Medicine (n=107,125)
Obstetrics & Gynecology (n= 56,52)
Pediatrics CMGs (n=56,64)
Pediatrics IMGs (n=8,16)
## Reliability Results

<table>
<thead>
<tr>
<th></th>
<th>Inter-Item</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter-Item</td>
<td>.98</td>
<td>.97</td>
</tr>
<tr>
<td></td>
<td>Inter-Station</td>
<td>.13</td>
<td>.08</td>
</tr>
<tr>
<td>Peds (CMG)</td>
<td>Inter-Item</td>
<td>.98</td>
<td>.98</td>
</tr>
<tr>
<td></td>
<td>Inter-Station</td>
<td>.24</td>
<td>.24</td>
</tr>
<tr>
<td>Peds (IMG)</td>
<td>Inter-Item</td>
<td>.98</td>
<td>.98</td>
</tr>
<tr>
<td></td>
<td>Inter-Station</td>
<td>.12</td>
<td>.23</td>
</tr>
<tr>
<td>IM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter-Item</td>
<td>.97</td>
<td>.98</td>
</tr>
<tr>
<td></td>
<td>Inter-Station</td>
<td>.26</td>
<td>.25</td>
</tr>
</tbody>
</table>
Research on the process of Transfer

Apply and adapt knowledge to new problems or contexts:

- Old problem to New problem
- Heart to Lung
- Classroom to Clinic

Experimental methods test theories of Transfer

Learning of physiology & physics concepts with undergraduates
Transfer Results

Learning in multiple contexts is critical

“Best practice” interventions fail without context variability

Different cognitive processes for different types of Transfer tasks?
Laparoscopic Skills
(Simulation and Acquisition)
PERD

- Development & Consultation
- Implementation
- Analysis

- Lab Group
- Journal Clubs
- PERD Education Rounds

Your resource for educational research &
Thank You

Questions?
dore@mcmaster.ca