EBM Curriculum Development & Evaluation

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Course Director – MSc Evidence-Based Health Care

Overview

• Rephrase and re-focus
• Review and apply the evidence
• Why is education an effective intervention
• Evaluating education
• CREATE – a practical framework
• Top tips summary
Language challenges
What are the differences between...

- Curriculum vs Learning
- Development vs Design
- Evaluation vs Assessment

The meaning of language

- Curriculum vs Learning
  “Planned educational experience”
- Development vs Design
  “bring out the capabilities or possibilities”
- Evaluation vs Assessment
  “determine the value or worth of”

= Designing effective learning
Review the purpose

Evidence-based Medicine, Practice, Health Care, Management, Policy, Thinking?

- Clinician experience
- Research evidence
- Patient Values

Review the evidence

**Continuing Practice Development**
3 Cochrane Reviews
- *Continuing education meetings and workshops*: effects on professional practice and health care outcomes: Forsellund et al, 2009
- *Interventions to improve question formulation* in professional practice and self-directed learning: Horsley, 2010

**Evaluating Education in Evidence-Based Practice**
3 systematic reviews
- *What is the evidence that postgraduate teaching in evidence based medicine changes anything?* A systematic review: Coomarasamy & Khan, 2004
- *Instruments for Evaluating Education* in Evidence-Based Practice A Systematic Review: Shaneyfelt et al, 2006
Consider the evidence in relation to your practice

Evidence for educational meetings, workshops

• *Educational meetings* alone or combined with other interventions, *can improve professional practice and healthcare outcomes* for the patients.

• The *effect is most likely to be small* and similar to ... audit and feedback, and educational outreach visits.

• *Strategies to increase attendance* at educational meetings, *using mixed interactive and didactic formats*, and *focusing on outcomes that are likely to be perceived as serious* may increase the effectiveness of educational meetings.

• *Educational meetings alone are not likely to be effective for changing complex behaviours.*

Continuing education meetings and workshops: effects on professional practice and health care outcomes: Forselund et al, Cochrane Effective Practice and Organisation of Care Group, 2009
Improving Formulating Questions?

Interventions to increase the quality of questions formulated in practice produce **mixed results** at short-term, and moderate-term follow up (< 9 months).

- 3 studies reported educational intervention **increased the quality of question formulation within the short term**
- 1 study examined the **effectiveness in after 1 year and revealed that search skills had eroded over time**.
- **Sustainability of effects from educational interventions for question formulation are unknown**.

Interventions to improve question formulation in professional practice and self-directed learning: Horsley, Cochrane EPOC Group, 2010

Using Local Opinion Leaders

Opinion Leaders are people who are seen as likeable, trustworthy and influential; they can use their influence to help and persuade others

- Opinion leaders delivered educational initiatives (meetings, materials)
- Many trials supplemented with audit & feedback, chart reminders

- **Opinion Leaders delivering education generally leads to 12% absolute increase in compliance to evidence-based practice.**

- **The effectiveness of opinion leaders is observed in single and multiple interventions, and for multidisciplinary opinion leaders.**

Local opinion leaders: effects on professional practice and health care outcomes: Foldgren et al, Cochrane EPOC Group, 2011
### Effective behaviour change strategies:
#### EPOC reviews (Grimshaw et al, 2012)

<table>
<thead>
<tr>
<th>Intervention</th>
<th># studies</th>
<th>Outcome</th>
<th>Effect sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed Educational Materials</td>
<td>12 RCTs</td>
<td>Median absolute improvement of care on process outcomes</td>
<td>4.3% Range (-8, 9)</td>
</tr>
<tr>
<td>Farmer et al, 2011</td>
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<tr>
<td>Educational Meetings</td>
<td>81 RCTs</td>
<td>Median absolute improvement of care</td>
<td>6.0% IQR (1.8, 15.3)</td>
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<tr>
<td>Forsellund et al, 2009</td>
<td>11,000 health professionals</td>
<td></td>
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<tr>
<td>Educational outreach</td>
<td>69 RCTs</td>
<td>Median absolute improvement in prescribing, other behaviours</td>
<td>4.8% IQR (3, 6.5)</td>
</tr>
<tr>
<td>O'Brien et al, 2008</td>
<td>15,000 health professionals</td>
<td></td>
<td>6.0% IQR (3.6, 16.0)</td>
</tr>
<tr>
<td>Local opinion leaders (education)</td>
<td>18 RCTs</td>
<td>Median absolute improvement of care</td>
<td>12% IQR (6, 14.5)</td>
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<tr>
<td>Flodgren et al, 2010</td>
<td>296 hospitals, 318 primary care physicians</td>
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<tr>
<td>Audit &amp; Feedback</td>
<td>140 RCTs</td>
<td>Risk difference in health professional compliance</td>
<td>4.3% IQR (0.5, 16.0)</td>
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<td>Ivers et al, 2012</td>
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<tr>
<td>Computerised Reminders</td>
<td>28 RCTs</td>
<td>Median absolute improvement of care</td>
<td>4.2% IQR (0.8, 18.8)</td>
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<td>Shojaia et al, 2011</td>
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**What do you need to review in your teaching?**

**Continuing Practice Development**

- *Continuing education meetings and workshops*: effects on professional practice and health care outcomes: Forsellund et al, 2009
- *Interventions to improve question formulation* in professional practice and self-directed learning: Horsley, 2010
Evaluating EBP teaching

OBJECTIVE:
To evaluate the effects of standalone versus clinically integrated teaching in evidence based medicine on various outcomes in postgraduates.

RESULTS:
Standalone teaching improved knowledge but not skills, attitudes, or behaviour.
Clinically integrated teaching improved knowledge, skills, attitudes, and behaviour.

CONCLUSION:
Teaching of evidence based medicine should be moved from classrooms to clinical practice to achieve improvements in substantial outcomes.


What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review.
Coomarasamy A, Khan KS.
Instruments for evaluating education in EBP

CONTEXT:
Teaching of EBP should be evaluated and guided by evidence of its own effectiveness.

DATA SYNTHESIS:
104 instruments identified: most used with medical students, postgrad trainees
Skills of acquiring and appraising evidence were most commonly evaluated.

CONCLUSIONS:
Instruments with reasonable validity are available for evaluating some domains of EBP and may be targeted to different evaluation needs.

*JAMA*. 2006 Sep 6;296(9):1116-27.
Instruments for evaluating education in evidence-based practice: a systematic review.
Shaneyfelt T, Baum KD, Bell D, Feldstein D, Houston TK, Kaatz S, Whelan C, Green M.

<table>
<thead>
<tr>
<th>Table 1. Characteristics of EBP Evaluation Instrumentsa</th>
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<tbody>
<tr>
<td>Characteristics</td>
</tr>
<tr>
<td>Participants’ health care profession discipline and training level</td>
</tr>
<tr>
<td>Students†</td>
</tr>
<tr>
<td>Medical students† (n = 43)</td>
</tr>
<tr>
<td>Postgraduate trainees‡</td>
</tr>
<tr>
<td>Practicing physicians†</td>
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<tr>
<td>Nonphysicians†</td>
</tr>
<tr>
<td>EBP evaluation domains</td>
</tr>
<tr>
<td>EBP knowledge</td>
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<tr>
<td>EBP skills</td>
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<tr>
<td>Ask</td>
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<tr>
<td>Acquire</td>
</tr>
<tr>
<td>Appraise</td>
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<tr>
<td>Apply</td>
</tr>
<tr>
<td>EBP attitudes</td>
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<tr>
<td>EBP behaviors</td>
</tr>
<tr>
<td>Performing EBP steps in practice</td>
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<tr>
<td>Performing evidence-based clinical maneuvers in practice</td>
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<tr>
<td>Patient outcomes</td>
</tr>
</tbody>
</table>

Abbreviation: EBP, evidence-based practice.
*See list for definitions. Categories are not mutually exclusive.
†Medical students (n = 43), dental students (n = 1), and nursing students (n = 1).
‡Intermediate medicine (n = 18), emergency medicine (n = 1), surgery (n = 3), obstetrics/gynecology (n = 3), pediatrics (n = 1), and family medicine (n = 8) residents.
§Nurses (n = 7), physical therapists (n = 1), researchers (n = 1), and not specified (n = 6).

Emergence of Domains for assessment

**EBP Knowledge**
- Ask
- Acquire
- Appraise
- Apply

**EBP attitudes**

**EBP behaviours**

Shaneyfelt et al, 2006
EBP in postgraduate healthcare education

BACKGROUND:
Systematic review of studies that assessed the effectiveness of EBP teaching & description of instruments available to evaluate EBP teaching.

RESULTS:
15 outcomes within 10 studies for which effect size (E-S) could be calculated
Studies assessing skills, behavior and/or attitudes had "small to moderate" Effect sizes.

CONCLUSION:
Small improvements in knowledge, skills, attitudes or behavior are noted when measured alone.
A large improvement in skills and knowledge in EBP is noted when measured together in a total test score.
Very few studies used validated measures, tests.

BMC Health Serv Res. 2007 Jul 26;7:119.
Evidence based practice in postgraduate healthcare education: a systematic review.
Flores-Mateo G, Argimon JM.

<table>
<thead>
<tr>
<th>1st author, year</th>
<th>Ca/NC</th>
<th>Effect Size (95% CI)</th>
<th>Effect Size (95% CI)</th>
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<tr>
<td>Knowledge</td>
<td></td>
<td></td>
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<tr>
<td>Fu 1999</td>
<td>12 / 12</td>
<td>0.43 (-0.04, 0.90)</td>
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</tr>
<tr>
<td>Forsetlund 2003</td>
<td>73 / 75</td>
<td>0.57 (0.32, 0.82)</td>
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<tr>
<td>Skills</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Munson 1996</td>
<td>107 / 107</td>
<td>0.41 (0.32, 0.51)</td>
<td></td>
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<tr>
<td>Fu 2003</td>
<td>13 / 13</td>
<td>0.30 (0.14, 0.46)</td>
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<tr>
<td>Smith 2000</td>
<td>17 / 27</td>
<td>0.21 (0.07, 0.36)</td>
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<tr>
<td>Taylor 2002</td>
<td>73 / 72</td>
<td>0.39 (0.15, 0.64)</td>
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<tr>
<td>Baum 2003</td>
<td>73 / 73</td>
<td>0.36 (0.15, 0.57)</td>
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<tr>
<td>Behaviour</td>
<td></td>
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<tr>
<td>Taylor 2000</td>
<td>73 / 72</td>
<td>0.01 (-0.07, 0.09)</td>
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</tr>
<tr>
<td>Forsetlund 2003</td>
<td>73 / 75</td>
<td>0.26 (0.07, 0.46)</td>
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<tr>
<td>Attitudes</td>
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</tr>
<tr>
<td>Bauman 2003</td>
<td>73 / 73</td>
<td>0.34 (0.04, 0.64)</td>
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<tr>
<td>Forsetlund 2003</td>
<td>73 / 75</td>
<td>0.07 (-0.06, 0.06)</td>
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<tr>
<td>Mean score</td>
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</tr>
<tr>
<td>Bazarian 1999</td>
<td>18 / 16</td>
<td>0.41 (0.16, 0.66)</td>
<td></td>
</tr>
<tr>
<td>Forsetlund 2003</td>
<td>73 / 75</td>
<td>1.38 (-1.11, 1.65)</td>
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<tr>
<td>Akl 2004</td>
<td>20 / 22</td>
<td>0.20 (-0.16, 0.56)</td>
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</tr>
<tr>
<td>McCluskey 2005</td>
<td>114 / 114</td>
<td>0.91 (0.56, 1.27)</td>
<td></td>
</tr>
</tbody>
</table>
What do you need to review in your evaluation of your teaching?

Evaluation of Education in Evidence-Based Practice

- What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review: Coomarasamy & Khan, 2004
- Instruments for Evaluating Education in Evidence-Based Practice A Systematic Review: Shaneyfelt et al, 2006

Education as a complex intervention

- Education = built up of a number of components which may act independently and interdependently

- Positive result
  - Educational Intervention had a positive effect

- Negative Result
  - Was the educational intervention delivered as planned?
  - What the intervention ineffective?

Check MRC guidance Craig et al, 2008
Why is education effective?

Importance of theory

- Theory = explanatory black box of why intervention works

- Useful theories
  - Adult learning theory
  - Self-directed learning
  - Social cognitive theory (Self-efficacy)
  - Reflective practice
Adult Learning Theory
Knowles, 1978

- Establish a climate where learners feel safe and comfortable expressing themselves
- Involve learners in planning content and methods of what is taught
- Involve learners in diagnosing their own learning needs and formulating learning goals
- Encourage learners to identify relevant resources and learning strategies
- Support learners in practically solving problems
- Involve learners in evaluating their own learning

Social Cognitive Theory: Bandura, 1977

- **self-efficacy** = belief in one’s capabilities to organise & act to succeed in particular situations
  - influences the way tasks are approached, effort invested, persistence, confidence

- individual self-efficacy developed from
  - personal attainments
  - social modelling, observation
  - verbal persuasion (from a credible source)
  - internal emotional and physiological states
    - *Success builds self-efficacy while failure lowers it.*
How do you use theories to support your teaching?

- Theory = explanatory black box of why intervention works
- Useful theories
  - Adult learning theory
  - Self-directed learning
  - Social cognitive theory (Self-efficacy)
  - Reflective practice

Evaluating learning?
Kirkpatrick’s model for learning

CREATE: A practical framework

- Consensus statement from International Conference EBHC Teachers and Developers, Sicily, 2009 = experience + evidence
- Aim to provide guidance for classification and development of EBP assessment tools
- Useful for designing assessment
- Validation ongoing mixed methods study
Promoting physical therapists’ use of research evidence to inform clinical practice: part 2 - a mixed methods evaluation of the PEAK program

<table>
<thead>
<tr>
<th>Assessment Category</th>
<th>Example Qualitative Questions</th>
<th>Quantitative Outcomes Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Benefit to Patients</td>
<td>Do you think patients have benefited?</td>
<td>EBP Implementation Scale</td>
</tr>
<tr>
<td>6 Behaviors</td>
<td>What about your skills and behaviors has changed?</td>
<td>Modified Fresno Test</td>
</tr>
<tr>
<td>5 Skills</td>
<td>What have you learned?</td>
<td>EBP Self-Efficacy Scale</td>
</tr>
<tr>
<td>4 Knowledge</td>
<td>How do you use and view EBP? (indirect)</td>
<td>EBP Beliefs Scale</td>
</tr>
<tr>
<td>3 Self-efficacy</td>
<td></td>
<td></td>
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<tr>
<td>2 Attitudes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Reaction to the</td>
<td></td>
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<tr>
<td>Educational Experience</td>
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</tbody>
</table>

CREATE
The Classification Rubric for EBP Assessment Tools in Education

Multifaceted Educational Program

Mixed methods evaluation of the PEAK program

RESULTS

- Fellows had universally positive attitudes about EBP and felt that it was essential to good patient management.
  "I definitely think that evidence-based practice is a very essential component of patient management. I think it’s the gold standard of patient care and so something I do take seriously, and I understand the importance of it."

- Fellows reported a substantial increase in self-efficacy for accurately and efficiently searching for research evidence.
  "And I feel like I can better access the literature very efficiently with patients. I’ll do it on my phone or very, very quickly. And so I feel like I do that more because I’m more efficient. Whereas before I would go, oh well, that might take me a little while."

- Fellows identified the Fellowship as a way to extend knowledge from their graduate education. They valued training in searching and appraisal but desired more information about understanding statistics.
  "I would say honestly in regards to the statistical aspect, I haven’t changed much from when we started to now."

- Fellows reported using new strategies and databases for searching, thinking about and discussing the literature.
  "In between patient treatments, if I have a question, I can quickly go on an examiner, look up and get very basic general information. I’m not going to do a super-detailed search... I’m not saying I do it all the time, but I do feel like I have the opportunity."
Comparative changes in self-efficacy: the PEAK program

Top Tips Summary

1. Plan – design learning outcomes to meet needs of learners in their context
   – aim for positive reaction to learning experience
2. Use interactive learning experiences
   – engage via individual’s use, views of EBP (attitudes, self-efficacy, confidence)
3. Include new knowledge, resources
4. Provide opportunity to develop skills
   – eg searching, critical appraisal
5. Integrate learning with clinical practice
   – practice new behaviours
6. Identify potential benefits for patients
7. PLAN TO EVALUATE EACH STAGE!!!