Design research and intervention implementation: Horse versus cart?

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Educational Design Research Conference, Enschede, 23 May, 2012
What is educational design research?

“…a genre of research in which the iterative development of solutions to practical and complex educational problems also provides the context for empirical investigation, which yields theoretical understanding that can inform the work of others.”

- McKenney & Reeves, 2012
Also known as....

- Design-based research
- Development research
- Design experiments
- Formative research
- Educational design research
Goals of EDR

Solutions to real & complex problems
- Programs
- Processes
- Products
- Policies

Theoretical understanding
- Describe
- Explain
- Predict
- Prescribe
Literature on EDR often speaks of embedding:

- **Scientific inquiry** into intervention design
  - “By engaging in design on both a technical and a social level, we were able to arrive at valuable insights in how to foster computer-supported collaborative learning.”
    - Hoadley, 2004

- **Intervention design** into scientific inquiry
  - In design-based research, practitioners and researchers work together to produce meaningful change in contexts of practice (e.g., classrooms, after-school programs, teacher on-line communities).
    - DBRC, 2003
Today’s talk

- Of the quest for theoretical understanding and the development of an intervention, which is:
  - **Horse**: powering the initiative?
  - **Cart**: carrying precious cargo to the destination?
- And especially: **is this mindset productive?**
Which is horse and which is cart?

It’s all in the eye of the beholder…

- Researchers usually:
  - View research as the horse, powering a theoretically-driven initiative that can also bring an intervention to practice

- Practitioners/developers usually:
  - View intervention as the horse, powering a need-driven initiative that can also bring new insights to others

- Views with balanced research ⇔ practice interaction exist, but are more the exception than the rule
Is the horse/cart (H/C) mindset productive?

- Some facets of productive
  - Strategically
  - Quality of process
  - Quality of results

- How do these look
  - In the short term?
  - In the long term?
Potential advantages of the short term
H/C Mindset: **Strategic advantages in the short term**

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Developers</th>
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**Research funds**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Seeds of Science</th>
<th>Roots of Reading</th>
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<tbody>
<tr>
<td>Reading Comprehension</td>
<td>48.6%</td>
<td>22.5%</td>
</tr>
<tr>
<td>Science Vocabulary</td>
<td>48.6%</td>
<td>22.5%</td>
</tr>
<tr>
<td>Science Content Knowledge</td>
<td>69.1%</td>
<td>37.8%</td>
</tr>
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</table>

**Practice funds**

**Mathematics Assessment Project**

- **3D and 2D Views**
- **3D View:**
- **Top view – surface of water:**

**THE ADVENTURES OF JASPER**

**JUMP in**
H/C Mindset: **Process** advantages in the **short term**

- Ejersbo et al, 2008
H/C Mindset: Advantages for **results in the short term**

- Ease tensions between research & development
  - Important contrast with commercial R&D: serving different masters
- Different reward systems, timelines, habits of mind, e.g.
  - Researcher reward systems value methodical, detailed work
  - Developer reward systems value production
  - Varying expectations for documentation
Potential risks of the long term
H/C Mindset: **Strategic risks in the long term**

- **Research:**
  - Current accountability climate emphasizes *relevance of research*
  - If research agendas continue to drive interventions in practice without substantial practitioner involvement/ownership/backing, sources of funding may decrease

- **For practice:**
  - Current accountability climate requires *ability to use evidence*
  - Solutions not infused with the ability to self-criticize and reflect (served by research) are destined to break down
H/C Mindset: Process risks in the long term

- Single (even rich) one-off cases (for research and development)
  - Can be informative
  - But are insufficient for theory-building
  - Will not help interventions transplant or scale (much)

- For theory building and interventions that can have impact, we need integrated processes to enable:
  - Observation of complex interactions
  - Over time
  - Under varying conditions
H/C Mindset: Risks for **results** in the **long term**

Exacerbates tensions between differing goals

- **If research methodology** is privileged then:
  - Practice needs may be shortchanged; thereby
  - Limiting ecological validity and usefulness of the findings
- **If practice is privileged**, then:
  - Research methods could be so compromised that the findings are useless
  - Immediate practice settings may be served in ways that render the intervention/findings less meaningful elsewhere
How might such an integrated process be useful?

- **Strategic value**
  - Helps demonstrate added-value of EDR
  - To other researchers and to practitioners
- **For robust design & research processes**
  - Sensitizes researchers to practice realities
  - Inculcates practitioner ownership in recursive, reflective process
- **For meaningful results**
  - Guards ecological validity
  - Helps increase quality and therefore impact on practice
What might an integrated process look like?

Generic Model for Educational Design Research (McKenney & Reeves, 2012)

UNIVERSITY OF TWENTE.
How to facilitate an integrated process?

- Where to start?
- How to proceed?
- What else can we, as design research enthusiasts, do?
Start by identifying suitable problems:

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<tr>
<th>When is a problem..</th>
<th>Theoretically</th>
<th>Practically</th>
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<tbody>
<tr>
<td><strong>Legitimate</strong></td>
<td>Addresses a clear gap in existing literature</td>
<td>Addresses a real problem and not a symptom</td>
</tr>
<tr>
<td><strong>Researchable</strong></td>
<td>If existing methods allow it to be studied well-enough</td>
<td>Can be identified in accessible contexts</td>
</tr>
<tr>
<td><strong>Research-worthy</strong></td>
<td>Contribute to theory building related to widely-held concern</td>
<td>Severe enough that stakeholders care to invest in solving it</td>
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Proceed by planning for actual use

- “…What are the absolutely essential features that must be in place to cause change under conditions that one can reasonably hope to exist in normal school settings?”
  - Ann Brown, 1992

- Actual use can be humble
  - Modest scope (e.g. short timelines, few participants)
  - Poorly defined (may be the case often)
  - Temporary (only pilot testing can still be valuable)

- But strives toward designs that *could* take off, rendering both intervention and understanding relevant and useful.
What can we, design research enthusiasts, do?

- Lobby for integrated research funding
- Lobby for reward systems to acknowledge contributions
  - Researchers: Practitioner publications and high quality interventions should count
  - Practitioners: increase recognition and possibly incentives for evidence-informed work
- Demonstrate the added-value of this approach by generating:
  - Theoretical understanding that informs the work of others
  - Solutions to problems in practice that have real impact
- Come together as a community
Conclusions & caveats

- Separating research and development processes as implied by the horse and cart mindset:
  - May hold merit in the short term
  - Should change in the long term to embrace a more integrated approach

- But note:
  - This talk focused on overall processes only
  - Process integration ≠ dilution of R or D standards
    - e.g. rigor may not be compromised
    - e.g. challenge of multiple roles
Thank you!

Comments and further discussion welcome:

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