Evaluating the Inverted Classroom

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Flipped Classroom Conference
Harvey Mudd College
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Introductions

- Name
- Institution
- Discipline
- What do you want to get from this workshop?
Agenda

• Research/ Evaluation of Flipped Classrooms
• Evaluation Results from Harvey Mudd Study
• General Evaluation Concepts
• Logic Model Development
• Exercise in Developing Framework for Flipped Classroom Evaluation
Trends in Flipped Classroom Research

• Most research focused on student attitudes
  – Bruff, Fisher, McEwen, & Smith, 2013; Foertsch, Moses, Strikwerda, & Litzkow, 2002; Lage & Platte, 2000; Lage, Platt, & Treglia, 2000

• Examples of student attitudes assessed:
  – If students (dis)liked the flipped classroom format
  – Student opinions regarding self-paced learning
  – Course structure elements students found challenging
  – Ease of using technology
  – Perceived quality of lectures
  – Professor responsiveness
Trends in Flipped Classroom Research

• Day & Foley (2006) study demonstrated positive student outcomes for students in an inverted classroom
  – Grades, homework, exam scores, etc.

• Mason, Shuman, & Cook (2013) study showed positive effects on student learning in inverted classroom
  – Inverted class also covered more material than traditional

• Current HMC project: controlled study
Evaluation Questions

• Do students in inverted classrooms *spend additional time actively working with instructors on meaningful tasks* in comparison to those students in control classrooms?
• Do students in inverted classrooms *actively participate and prepare for class* through the videos and other materials?
• Do students in inverted classrooms show *higher learning gains* as compared to students in traditional classrooms?
• Do students in inverted classrooms demonstrate an increased ability to *apply material in new situations* as compared to students in traditional classrooms?
• Do students in inverted classrooms demonstrate increased *metacognitive gains* as compared to students in traditional classrooms?
• What are *faculty experiences* when teaching inverted course sections?
Methods & Measures

• Implementation measures
  – Student participation & preparation measures

• Outcome measures
  – Student learning/content measures
  – Transfer of knowledge measures
  – Metacognition measures
  – Student attitude & satisfaction measures
  – Faculty satisfaction measures
Evaluation Results

• No consistent significant differences between flipped and traditional classes

• Why?
  – Students are high achieving across groups
  – Indistinct condition groups
  – Importance of active learning
  – Students may benefit most from a strong hybrid model
Evaluation 101

• Evaluation is the “…process of determining the merit, worth, or value of something, or the product of that process…” (Scriven, 1991)

• Importance of Evaluation
• Difference between Research & Evaluation
• Basic Designs & Methods
The Importance of Evaluation

• Why include evaluation
  – Especially from the beginning of the program plan
• What should I expect to gain from evaluation
• Choosing an evaluator
• Stakeholders & audience
• Differentiating evaluation, assessment, measurement, etc.
Research

Seek to generate new knowledge
Researcher-focused
Hypotheses

Make research Recommendations
Publish Results

Evaluation

Information for decision-making
Stakeholder-focused
Evaluation questions

ANALYSIS

Recommendations based on key questions
Report to Stakeholders

METHODS
Defining Some Evaluation Terms:
Evaluation 101

• Evaluation Designs
  – Experimental (e.g., RCT)
  – Quasi-experimental (e.g., Time Series)
  – Non-experimental (e.g., Case Studies)

• Evaluation Methods Examples
  – Quantitative: Surveys, Assessments
  – Qualitative: Observations, Focus Groups, Individual Interviews
  – Mixed methods
Types of Evaluation and Terms

• Formative
• Summative
• Process
• Outcome
• Impact

More information is available at the American Evaluation Association website: eval.org
Process for Designing an Evaluation

- Identify Need
- Base Planned Program / Intervention Activities on Need
- Develop Evaluation Questions
- Establish Evaluation Methods (Quant and/or Qual)
- Determine Evaluation Design (including timeline) and Level of Evidence Needed
- Estimate Analysis Plan
- Develop Logic Model
Logic Models

• One tool for assisting in development of program activities and evaluation of those activities
Using Logic Models in the Program Development Stage

- Help to communicate a program’s theory of change and help determine evaluation focus
- Test the logical relationships between what you do and what you expect to see as a result of what you do
- Communicate how your program/intervention operates to others
- Reveal data needs and provide a framework for interpreting results
Logic Models

• What is a logic model?
• Common elements in a logic model:
  • Inputs
  • Activities
  • Outputs
  • Outcomes
  • Assumptions
  • External Factors

Logic Model Resources

- University of Wisconsin – Extension: templates, examples
  http://www.uwex.edu/ces/pdande/evaluation/evallogicmodel.html

- W. K. Kellogg Foundation: development guide
Logic Model: Simplest Form

HEADACHE

INPUTS
Get Pills

OUTPUTS
Take Pills

OUTCOMES
Feel Better

Situation
What needs are we addressing?

Students lack experiences outside the classroom that prepare them for the world of work
What resources do we need for the program?

Staff, building, materials, etc.
What activities are planned to address the needs?

Who will participate?

Students attend internships 10 hours/week for 12 weeks
What are the short-term and long-term changes we expect to see in participants?

Students acquire technical skills & networking (short-term)

Students find employment (long-term)
What beliefs do we have about the program?

*Internships are a necessary part of the student experience*

What is the environment in which the program exists?

*Poor economy, high unemployment*
Clarifying Outputs vs. Outcomes

• Number of patients discharged from state mental hospital is an output.

• Percentage of discharged who are capable of living independently is an outcome.

Not how many worms the bird feeds its young, but how well the fledgling flies (United Way of America, 1999)
### Outputs vs. Outcomes Examples

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<thead>
<tr>
<th>Crime Control</th>
<th>Highway Construction</th>
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<tbody>
<tr>
<td>- Hrs of patrol</td>
<td>- Project designs</td>
</tr>
<tr>
<td>- # responses to calls</td>
<td>- Highway miles constructed</td>
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<tr>
<td>- # crimes investigated</td>
<td>- Highway miles reconstructed</td>
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<tr>
<td>- Arrests made</td>
<td>- Capacity increases</td>
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<td></td>
<td>- Improved traffic flow</td>
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<td>- Reduced travel times</td>
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<td>- Reduction in accidents and injuries</td>
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<td>- Reduction in crimes committed</td>
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<td>- Reduction in deaths and injuries resulting from crime</td>
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<tr>
<td></td>
<td>- Less property damaged or lost due to crime</td>
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*From Poister, 2003*
Creating a Logic Model for Your Evaluand

1. Start with a Need
2. List your Evaluand (e.g., Program) and provide a brief description
3. Identify one activity (Outputs)
   • Specify how much of that activity needs to happen to address the need (Activities)
   • Establish who will be reached by the activity and what is required of their participation (Participation)
4. What resources are required? (Inputs)
5. What is your goal for meeting the needs? (Outcomes)
   • List at least one short-term and one long-term outcome
6. List Assumptions & External Factors about your Evaluand
Evaluation Q & A
Keep in Touch!

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