Infrastructure and Innovation

John Mitchell
Topics (from Rajeev Alur’s email)

• Experience from wide-scale deployment of courses and tools

• Survey of relevant initiatives by
  – Govt agencies
  – MOOC providers
  – Universities

• Collaboration with industry

• Access to data, privacy
Plan

(1) Experience from wide-scale deployment of courses and tools
   • Survey of relevant initiatives by
     - Govt agencies
     - MOOC providers
     - Universities

(2) Thoughts on structuring a research prog
   • Collaboration with industry

(3) Access to data, privacy
VPOL: 446 Projects over 3 Years

Number of Projects by Calendar Year | Winter 2012 — Fall 2014

- **Repeat**
- **Revised**
- **First Run**

<table>
<thead>
<tr>
<th>Year</th>
<th>Repeat</th>
<th>Revised</th>
<th>First Run</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10</td>
<td>6</td>
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<td>44</td>
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<td>2013</td>
<td>30</td>
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<td>2014</td>
<td>120</td>
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</table>
Lytics Lab

Teach Course

Collect Data

Analyze Data

Refine Learning models
Clustered patterns of engagement

- Very Involved
- Dropped Out
- Audited
- Explored

Not to mention those who enrolled and never watched a video or did a quiz.

[Kizilcec, Piech, Schneider]
One student is highlighted

- student she graded
- student who graded her

[Huang and Piech]
Some students were getting very erroneous grades.

Corrections involve weighting reliable graders and additive correction for bias.

99% within 10pp
• Attrition and Achievement Gaps in Online Learning
  – René F. Kizilcec, Sherif Halawa

• PeerStudio: Rapid Peer Feedback Emphasizes Revision and Improves Performance
  – Chinmay E. Kulkarni, Michael S. Bernstein, Scott R. Klemmer

• Autonomously Generating Hints by Inferring Problem Solving Policies
  – Chris Piech, Mehran Sahami, Jonathan Huang, Leonidas Guibas
Building a research community

- Very significant progress through
  - L@S, ...
  - This workshop ....
  - Annual meetings by Coursera, edX

- How are we doing overall?
  - Grand challenge problems
  - Community building
  - Collaboration plan(s)
  - Constructive competition

- What will universities look like in the future?
Institute for the Future of Higher Education

- **Foundations**: Educational psychology, “educational social interaction”, neuroscience, …
- **Learning science**: research and development
- **Economics and public policy**
- **Computer science**: data modeling, machine learning, social network analysis, sentiment analysis, …, open-source software tools and systems
- Wild new educational experiments
- Some transition paths for successful experiments
Some tensions

Collaboration across institutions: data sharing, privacy