Monitoring MOOCs: Which Information Sources Do Instructors Value?

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Main Takeaways

• **Goal:** Information display for MOOC instructors

• **Survey:** What information MOOC instructors value?

• **Results:**
  • Quantitative information valued same as smaller online courses
    • Assignment grades, demographics, activity patterns
  • Qualitative information is important
    • Forums, student surveys
  • Visualization mockups useful while course running and for review
Prior Work: Data to Visualize

• **Performance**
  - Grades, cumulative concept performance

• **Access and Activity Patterns**
  - What, how much, how long, and when content opened
  - Path through content
  - Assignment status

• **Forum Discussions**
  - Student forum activity
  - Post meta data
  - Post structure

• **Student Demographics**
  - Location, age, learning style
  - Course goals
Prior Work: How Visualize Data

• **Standard Graphs**
  • Scatter plots, bar graphs, line graphs, pie charts, heat maps

• **Innovative Visualizations**
  • Node graphs, icons, 3D, timeline spiral graphs

• **Interactive Techniques**
  • Sorting
  • Filtering
  • Drill down
  • Clustering
Why need a survey?

• Prior work on
  • Long distance learning
  • Course management systems

“Small” Courses

• What about MOOCs?
  • Massive
  • Open enrollment
Survey Participants

- Recruit
  - Coursera
  - edX
  - Udacity

- 92 MOOC Instructors
  - 67 complete survey (73%)
Survey Participants

Number of MOOCs Created

- 95% Create 1 or more MOOCs

Number of MOOCs Run

- 94% Run 1 or more MOOCs
Survey Participants

Platforms used by Participants

<table>
<thead>
<tr>
<th>Platform</th>
<th>Number of Participants</th>
</tr>
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<tbody>
<tr>
<td>Coursera</td>
<td>70</td>
</tr>
<tr>
<td>edX</td>
<td>20</td>
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<tr>
<td>Blackboard</td>
<td>10</td>
</tr>
<tr>
<td>Moodle</td>
<td>5</td>
</tr>
<tr>
<td>Udacity</td>
<td>5</td>
</tr>
<tr>
<td>Piazza</td>
<td>5</td>
</tr>
<tr>
<td>WebCT</td>
<td>5</td>
</tr>
<tr>
<td>Canvas</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
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</tr>
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<td>N/A</td>
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## Survey Participants

<table>
<thead>
<tr>
<th></th>
<th>Students at Course End</th>
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<td>1,000s</td>
<td>10,000s</td>
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<tr>
<td>Other</td>
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<td>3</td>
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<td>11</td>
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<td>Total</td>
<td>7</td>
<td>46</td>
<td>34</td>
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Course Monitoring Goals

• During class
  • Assignment issues
  • Find trouble students and what struggle with
  • Gauge difficulty of exam problem
  • Course is appropriate difficulty level

• After class
  • Find most engaging content
  • Struggling parts of class
  • TA effectiveness
  • Improve topic presentation
  • Least interesting content
Information Sources

• Quantitative
  • Assignment grades
  • Student answers to problems
  • Student’s view pattern of online content
  • Number of times students attempt a problem
  • Grades for self-check questions

• Qualitative
  • Discussion forum
  • Class survey
  • Discussion with students
  • Ask the TA
  • Chat room logs
Cross: Goals X Info Sources

- Assignment issues
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Assignment grades
Student answers to problems
Student’s view pattern of online content
Number of times students attempt a problem
Grades for self-check questions
Discussion forum
Class survey
Discussion with students
Ask the TA
Chat room logs
## Cross: Goals X Info Sources

<table>
<thead>
<tr>
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<th>Use</th>
<th>Would use if available</th>
<th>Do not/Would not use</th>
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<tr>
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<td>Use</td>
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<tr>
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## Find trouble students and what struggle with

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Value of Information Sources: Across Goals

- Forum
- Class Survey
- Student Dis.
- Teaching Assist.
- Assign. Grade
- Prob. Answer
- View Patterns
- Prob. Attempts
- Self Check Q.
- Chat Logs

Legend:
- Not Use
- Skip
- Use/Would Use
Value of Information Sources: Across Goals

Not Use
Skip
Use/Would Use

0%
25%
50%
75%
100%

Forum
Class Survey
Student Dis.
Teaching Assist.
Assign. Grade
Prob. Answer
View Patterns
Prob. Attempts
Self Check Q.
Chat Logs

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Value of Information Sources: Across Goals

- Forum: 100%
- Class Survey: 100%
- Student Dis. Teaching Assist.: 100%
- Assign. Grade: 100%
- Prob. Answer: 100%
- View Patterns: 100%
- Prob. Attempts: 100%
- Self Check Q.: 100%
- Chat Logs: 100%

- Not Use
- Skip
- Use/Would Use
Value of Information Sources: Across Goals

- Forum: 100% Use/Would Use
- Class Survey: 100% Use/Would Use
- Student Dis. Teaching Assist.: 75% Use/Would Use
- Assign. Grade: 75% Use/Would Use
- Prob. Answer: 75% Use/Would Use
- View Patterns: 75% Use/Would Use
- Prob. Attempts: 75% Use/Would Use
- Self Check Q.: 75% Use/Would Use
- Chat Logs: 75% Use/Would Use

Legend:
- Red: Not Use
- Light Green: Skip
- Blue: Use/Would Use
Value of Information Sources: Across Goals

- Forum
- Class Survey
- Student Dis.
- Teaching Assist.
- Assign. Grade
- Prob. Answer
- View Patterns
- Prob. Attempts
- Self Check Q.

Categories:
- Not Use
- Skip
- Use/Would Use

Qualitative
Quantitative
Outlier
Value of Information Sources: By Goal

Assignment Issues

- Use/Would Use
- Skip
- Not Use
Value of Information Sources: By Goal

Assignment Issues

- Not Use
- Skip
- Use/Would Use
Value of Information Sources: By Goal

Assignment Issues

- Not Use
- Skip
- Use/Would Use
- Qualitative
- Quantitative
Value of Information Sources: By Goal

- Not Use
- Skip
- Use/Would Use
- Qualitative
- Quantitative
Value of Information Sources: By Goal

Qualitative + Quantitative

Qualitative + some View Patterns

No Agreement

- Not Use
- Skip
- Use/Would Use
- Qualitative
- Quantitative
What does qualitative mean?

- Qualitative Data:
  - Forums
  - Class Surveys
  - Student Discussions
  - Teaching Assistant

Student Voice

People
1. Useful
   a. (Likert response)

2. Easy to understand
   a. (Likert response)

3. When use it?
   a. While the course is running
   b. When preparing new material
   c. When preparing by reviewing past courses
Visualization Mockups

• Majority participants find useful and understandable

• Majority participants use
  • During class ⇧ All
  • Review ⇧ All, except (quantitative) forum
Limitations

• *Survey*
  
  • Some questions ask predict future behavior
    • (people not necessarily good at)
  
  • Instructors not experienced with all information sources

• *Forum*
  
  • Small sample of student body
Other Work: Metrics Tab

Section 2: Biochemistry 1

Count of Students Opened a Subsection

Grade Distribution per Problem

942 students opened Subsection 1: Photosynthesis

P3.4.1 Chemical bonds & Sun - 486 students (100.0%; 1/1 questions)

Attempt Distribution per Problem (Last updated: about 1 day ago)

P4.2.1 Free Radicals - 241 students had 2 attempt(s)

Stanford edX Branch
Summary

• **Goal:** Information display for MOOC instructors

• **Survey:** What information MOOC instructors value?

• **Results:**
  • Quantitative information valued same as smaller online courses
  • Qualitative information is important
  • Visualization mockups useful while course running and for review

• **Future work:**
  • More visualizations
  • Improve communication of student voice to instructor
Spare Slides
Mockup: Boxplot Grades Distribution

HW2: Basic Python
High: 96%  
75th: 79%  
Median: 50%  
Low: 23%  
25th: 42%
Mockup: Stacked Bar Grades Distribution

Problem Grade Distribution

Number of Students

P1 P2 P3 P4 P5

Problem

P3 Example Python Code:
Loops
Grade: 66%
Students: 342
Mockup: Stacked Bar Attempts Distribution

P3 Example Python Code: Loops
Attempts: 5 (10 allowed)
Students: 39
Mockup: Stacked Bar Views Distribution

Video 2: How to load the project sample code.
Views: 2
Students: 122
Mockup: Line Graph Forum

New Posts

Views

9/8/2013
New Posts: 7
Posts Viewed: 14
Question about HW3...
Get Project Sample Code...