Coursera’s Introductory Human Physiology Course:

Factors that Characterize Successful Completion of a MOOC

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Introductory Human Physiology

Study based on data from the 1st session, February 2013 (4th session is running now)

Instructors:
Dr. Mimi Jakoi and Dr. Jennifer Carbrey, Department of Cell Biology (Medicine)

12 week course based on an intro grad course at Duke

2-8 videos a week, 7 to 40 minutes long

grade based on avg on 3 MCQ exams, passing – 70-84%, distinction 85-100%

Signature Track available

image by OCAL (modified), http://www.clker.com/clipart-26784.html, public domain
Course Statistics

33,738 students accessed the course
around 15,000 students responded to the pre-course survey

did not complete any exams – 84%
completed some exams but not all – 11%
completed all exams but did not pass – 1.8%
passed the course without distinction – 2.0%
passed the course with distinction – 1.0%

posted on the discussion forum – 6.5%
Planning the Analysis File

- First Coursera dataset built by Academic Affairs for use in quantitative research

- Sent inventory of available Coursera HP data to Jennifer

- Met with Jennifer and Deborah

- Developed a data plan
Building the Analysis File

- Using the data plan as I reference, I pulled a subset of variables for both sessions
  - Pre, post, demographics surveys
  - Grades
  - Forum posts
- Joined inputs into 3 analysis files
  - Session 1
  - Session 2
  - Both sessions
- Added constructed variables: number forum posts, took all tests, took some but not all tests
Data Analysis

• All variables categorical

• $X^2$ Goodness of Fit tests
  – Observed vs expected distribution of responses
  – $p \leq 0.05$
Please indicate your level of proficiency with the English language (non-native speakers)

<table>
<thead>
<tr>
<th></th>
<th>Took all exams, Did NOT Pass (n=173)</th>
<th>Took all exams, Earned DISTINCTION (n=111)</th>
<th>All Students (n=6537)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluent</td>
<td>33%</td>
<td>50%</td>
<td>43%</td>
</tr>
</tbody>
</table>
What is the highest level of education you have completed?

<table>
<thead>
<tr>
<th></th>
<th>Took all exams, PASSED (n=411)</th>
<th>Took all exams, Earned DISTINCTION (n=214)</th>
<th>All Students (n=14821)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some College</td>
<td>11%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Doctoral</td>
<td>10%</td>
<td>15%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Which of the following best describes your academic background?

<table>
<thead>
<tr>
<th></th>
<th>Took all exams, Earned DISTINCTION (n=174)</th>
<th>All Students (n=12419)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>33%</td>
<td>18%</td>
</tr>
</tbody>
</table>
What best describes your previous experience in the course’s subject area?

<table>
<thead>
<tr>
<th></th>
<th>Took all exams, PASSED (n=412)</th>
<th>Took all exams, Earned DISTINCTION (n=213)</th>
<th>All Students (n=15234)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some coursework/work experience</td>
<td>39%</td>
<td>48%</td>
<td>36%</td>
</tr>
<tr>
<td>Degree in field/Significant work experience</td>
<td>23%</td>
<td>18%</td>
<td>15%</td>
</tr>
</tbody>
</table>
How much of the course activities do you plan to complete?

<table>
<thead>
<tr>
<th></th>
<th>Took SOME exams (n=1716)</th>
<th>Took all exams, Did NOT pass (n=326)</th>
<th>Took all exams, PASSED (n=410)</th>
<th>Took all exams, Earned DISTINCTION (n=215)</th>
<th>All Students (n=15219)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Few</td>
<td>10%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>18%</td>
</tr>
<tr>
<td>All</td>
<td>56%</td>
<td>58%</td>
<td>58%</td>
<td>64%</td>
<td>45%</td>
</tr>
</tbody>
</table>
# of discussion forum posts

<table>
<thead>
<tr>
<th></th>
<th>Took all exams, Did NOT pass (n=620)</th>
<th>Took all exams, PASSED (n=696)</th>
<th>Took all exams, Earned DISTINCTION (n=338)</th>
<th>All Students (n=5430)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>70%</td>
<td>69%</td>
<td>62%</td>
<td>80%</td>
</tr>
<tr>
<td>&gt; 1 post</td>
<td>16%</td>
<td>16%</td>
<td>20%</td>
<td>9%</td>
</tr>
<tr>
<td>&gt; 10 posts</td>
<td>2%</td>
<td>2%</td>
<td>6%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Conclusions

Separation of students into 5 groups allowed us to look more closely at:
students who took all exams but did not pass
students who earned distinction

The composition of the 5 groups differed in a statistically significant manner with respect to most variables.

Our study, as well as studies from others (Breslow, 2013; Ho, 2014), have shown that student characteristics such as proficiency in English, highest level of education, and academic background can influence achievement.

although statistically significant, not large enough differences for characteristics to be predictive
Future Directions

Using what we have learned, how can we change our course to enable more students to complete? translations, more background material

What can we learn about the students who intended to complete our course but didn’t? post-course survey data – no dominant reason largest effects: reducing weekly time commitment, making course easier