Scaling Expert* Feedback

Two Case Studies

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LEARNING AT SCALE

Number of students \uparrow \quad Staff per student \downarrow

Peer Feedback
Automated Feedback
Implicit Feedback
No Feedback
ENDORSEMENT

LEARNING

AT

SCALE
Why is a college endorsement valuable?

Knowledge: What they know
Diligence: What they can do
Experience: What they have received
Identity: Who they are
Automated Evaluation?  
Peer Evaluation?  
Implicit Evaluation?  
Human Evaluation?
7,500+ students

Human Evaluation?  ✔

15,000+ students
• Identical accreditation
• $510 per semester
• 5000 students, 1.5 classes per student per semester
• 30 classes, 175 TAs
• Up to 600 students/class
• 80% per-class retention
• Projected to increase MSCS graduates by 8%
Therefore, we hypothesized:

\[\times\] OMSCS students are unlikely to work as teaching assistants.
Compared to residential students, OMSCS students are...

- Older
- More educated
- More experienced
- More likely to be employed
- More likely to have families
- Paying less in tuition

Therefore:

4x as many OMSCS students apply to work as teaching assistants as we have capacity to hire.

Therefore:

OMSCS students are unlikely to work as teaching assistants.
Were there enough more traditional OMS students to supply our TAs?

Were our beliefs about all TAs’ motivations wrong?

Or are online students differently motivated than residential students?
Online vs. Residential TA Applicants

- % over 25 years old
- % over 34 years old
- % Native English Speakers
- % Employed Full-Time
- % with Children at Home
- % with Advanced Degree

Online: 90
Residential: 30

Online: 80
Residential: 40

Online: 60
Residential: 20

Online: 50
Residential: 10

Online: 40
Residential: 5

Online: 30
Residential: 1

Online: 20
Residential: 10

Online: 10
Residential: 0

Online: 0
Residential: 0

Online: 0
Residential: 0

Legend:
- Online
- Residential
Were there enough more traditional OMS students to supply our TAs?

Were our beliefs about all TAs’ motivations wrong?

Or are online students differently motivated than residential students?
<table>
<thead>
<tr>
<th>Motivation</th>
<th>Online</th>
<th></th>
<th>Residential</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
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<tr>
<td>To obtain a tuition waiver</td>
<td>0%</td>
<td>4%</td>
<td>53%</td>
<td>90%</td>
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<tr>
<td>To obtain a salary or stipend</td>
<td>9%</td>
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<td>To improve my resume</td>
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<td>1%</td>
<td>22%</td>
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<td>19%</td>
<td>64%</td>
<td>10%</td>
<td>56%</td>
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<tr>
<td>To help my classmates</td>
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Were there enough more traditional OMS students to supply our TAs?  

Were our beliefs about all TAs’ motivations wrong?  

Online students are differently motivated than residential students
The Georgia Tech OMSCS program can radically increase size while preserving student:expert interaction by relying on online students’ intrinsic and altruistic motivation to help.
Online Master of Science in Computer Science

Offered in collaboration with Udacity and AT&T

Machine Learning Nanodegree Program
• Vocational credential
• MOOC-based, with some expert-graded projects
• Monthly subscription
• $200/month

>15,000 students
13 Nanodegree programs with industry partners
5 Nanodegree programs with job guarantees
Forum Mentors: Paid per Contribution

Project Reviewers: Paid per Project Review
The Project Reviewer Network

Available On-Demand

Dynamically Allocated

Staffed by Professionals

Formative Feedback

Rapid Feedback

Multiple Iterations

Formative Assessment

etc.
Median Turnaround Time: 119 minutes

Student Satisfaction: 4.85 / 5.0

Projects Graded per Day: 1400

Top Reviewer Pay: $5,400/week
Udacity’s network model can dramatically increase volume, rapidity, and quality of student:expert interaction while also increasing size using a gig economy model.
Preserves student:expert interaction while scaling by combining the traditional teaching assistant model with intrinsically motivated, highly qualified online TAs.

Increases student:expert interaction while scaling through a dramatically different, on-demand model for questions and project evaluations.
Questions?

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