Understanding Massive Open Online Courses as a Pathway to Employment for Low-Income Populations

Tawanna Dillahunt and Stephanie Teasley

Bingxin Chen, Michelle Fiesta

Thursday, December 5

3:30 – 4:00

MOOC Research Initiative Conference

Motivation

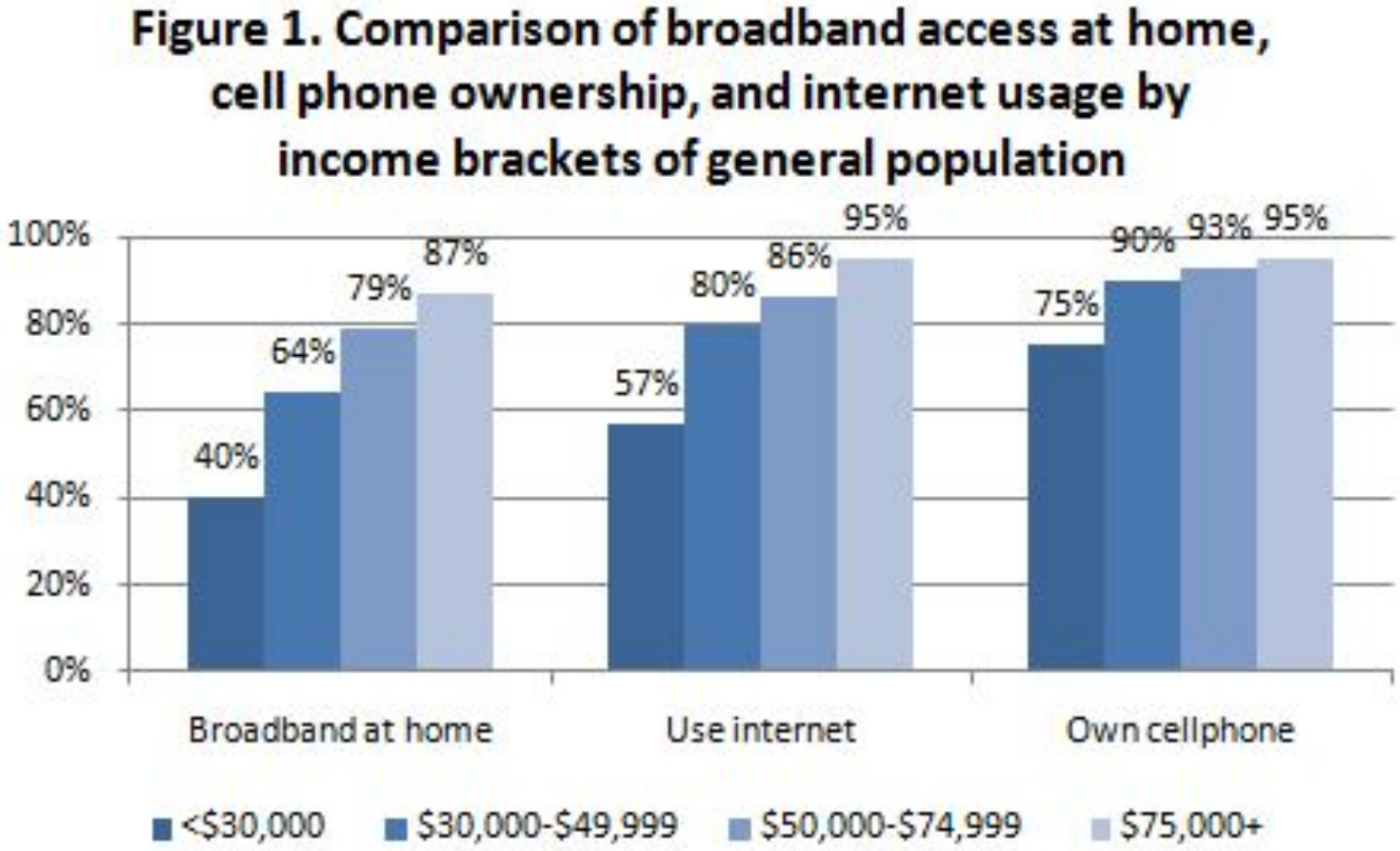
Education is the key to "get ahead" according to 30 "downwardly mobile" Detroiters interviewed in a pilot study conducted in 2013

Image from: http://www.mlive.com/business/west-michigan/index.ssf/2009/12/michigan_grants_two-month_exte.html

Massive **O**pen **O**nline **C**ourse

Image from: http://www.clarity-innovations.com/blog/lfisher/move-moocs

Narrowing Digital Divide



Source: Pew Research Center's Internet & American Life Project, August 9-September 13, 2010. Tracking Survey. N= 3,001 adults and the margin of error is +/-2.5 percentage points

THE CHRONICLE OF HIGHER EDUCATION
December 2, 2013

Wired Campus
The latest on tech and education.

November 20, 2013 by Steve Kolowich

Comments (44)

MOOCs Are Largely Reaching Privileged Learners, Survey Finds

Most people who take massive open online courses already hold a degree from a traditional institution, according to a new paper from the University of Pennsylvania.

The paper is based on a survey of 34,779 students worldwide who took 24 courses offered by Penn professors on the Coursera platform. The findings—among the first from outside researchers, rather than MOOC providers—reinforce the truism that most people who take MOOCs are already well educated.

The Penn researchers sent the survey to students who had registered for a MOOC and viewed at least one video lecture. More than 80 percent of the respondents had a two- or four-year degree, and 44 percent had some graduate education.

The pattern was true not only of MOOC students in the United States but also learners in other countries. In some foreign countries where MOOCs are popular, such as Brazil, China, India, Russia, and South Africa, "80 percent of MOOC students come from the wealthiest and most well educated 6 percent of the population," according to the paper.

Wired Campus Bloggers

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@jryoung

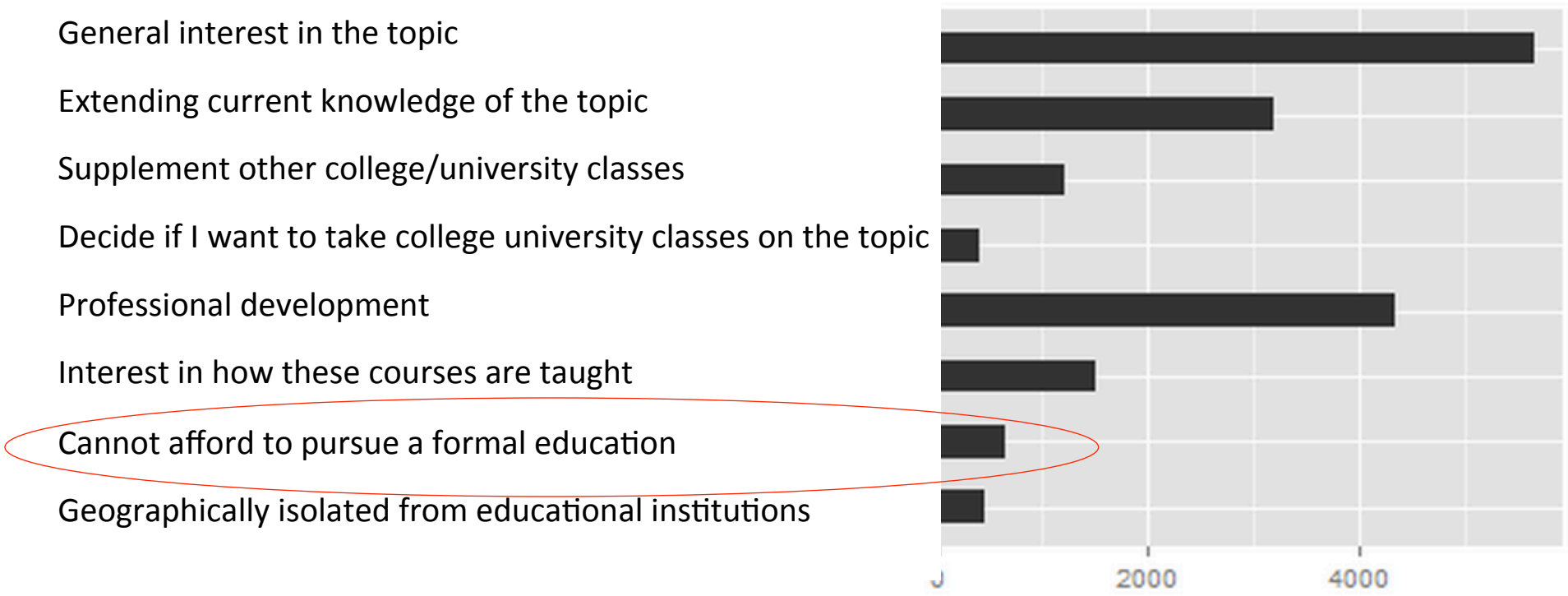
"The individuals the MOOC revolution is supposed to help the most—those without access to higher education in developing countries—are underrepresented among the early adopters"

[Christensen, Steinmetz, Alcorn, Bennett, Woods, Emanuel, 2013]

Few studies examine *how* populations with the most to gain leverage these resources

Who is our target population?

Q7: Which options best describe your motivations for taking this class? (please check all that apply)



Two groups

Group 1:	Group 2:
Those that cannot afford a formal education	Other
Target	**Comparison**

Our goals

- To understand details about our target population, and how they compared to others (i.e. to the comparison group)

- To understand if MOOCs could be a platform for economic mobility among low-income, or economically distressed populations

Research Questions

1. How do students unable to afford a formal education compare to and/or contrast demographically to other students?
2. How do students unable to afford a formal education perform in comparison to other students?
3. How might students leverage these courses to find employment?
   - What types of courses are needed to increase student employment opportunities?

Approach

- Use descriptive statistics to compare and contrast two groups
  - Demographics
  - Current employment
  - Highest level of education achieved
  - Motivation
  - Performance and engagement

- Conduct interviews (qualitative analysis) to understand how students are using courses for employment and how courses could be used to support economic mobility

Limitations

- University of Michigan (UM) Coursera Courses

- Preliminary analysis done for a single class only
  - Model Thinking

Model Thinking (Winter 2013)

- 10-week long course
- 4-8 hours per week
- Attracts students with a wide variety of educational backgrounds
- No textbooks and no prerequisites required
- Taught in English with Chinese, English, and Ukrainian subtitles

Instructor: Scott E. Page
UM Professor of Complex Systems, Political Science, and Economics

Data Types

- UM post-course survey data
  - Demographics
  - Motivations for taking the course
- Online activities and course performance
  - Course materials viewed
  - Videos watched
  - Forum engagement

Image from: http://sws.canterbury.ac.uk/so138/surveypost.html

Image from: http://coursera.org

Preliminary Results | Demographics

Out of 38,411 registered students	Total N	% response
1. What is your gender? (open ended)	8,977	23.3%
2. What is your age? ☐ Under 18 ☐18-24 ☐ 25-34 ☐ 35-44 ☐45-54 ☐ 55+ ☐ I prefer not to answer	7,750	20%
3. What is your highest level of education achieved? ☐ Some high school ☐High school ☐ Associate's degree (2 years college) ☐ Bachelor's degree (BA/BS4 years college) ☐ Doctoral degree ☐ Professional degree (MD, JD)	6,708	17.4%
4. What is your current occupation? Select all that apply. ☐ Student ☐Teacher ☐ Other	7,977	20.8%

Our target population

Out of 6,708 respondents	Total N	% response
Target group (not able to afford a formal education)	650	9.7%
Comparison group (all others)	6,058	90.3%

Demographics | Gender

Out of 8,977 respondents	Total N	% response
Male	4,648	69.6%
Female	4,329	30.4%

Out of 6,728 respondents	Target	Comparison
Male	69.7% (N=453)	69%(N=4194)
Female	28.8% (N=187)	30.3% (N=1844)

Key Takeaway: Gender representation relatively the same across groups

Demographics | Age

Out of 6,717 respondents	Total N	% response
25-34	2,777	41.34%
18-24	1553	23%

	Target	Comparison
25-34	303 (46.6%)	2474 (40.9%)
18-24	142 (21.9%)	1411 (23.26%)

Key Takeaway: 25-34 year olds make up the majority age group across both groups

Demographics | Employment

Out of 2,786 respondents	Total N	% response
Students	1895	68%
Non-Students (Other)	891	32%

	Target	Comparison
Students	18.8% (N=122)	29% (N=1773)
Non-Students (Other)	22% (N=145)	12%(N=746)

Key Takeaway: Target population less likely to be students than comparison group

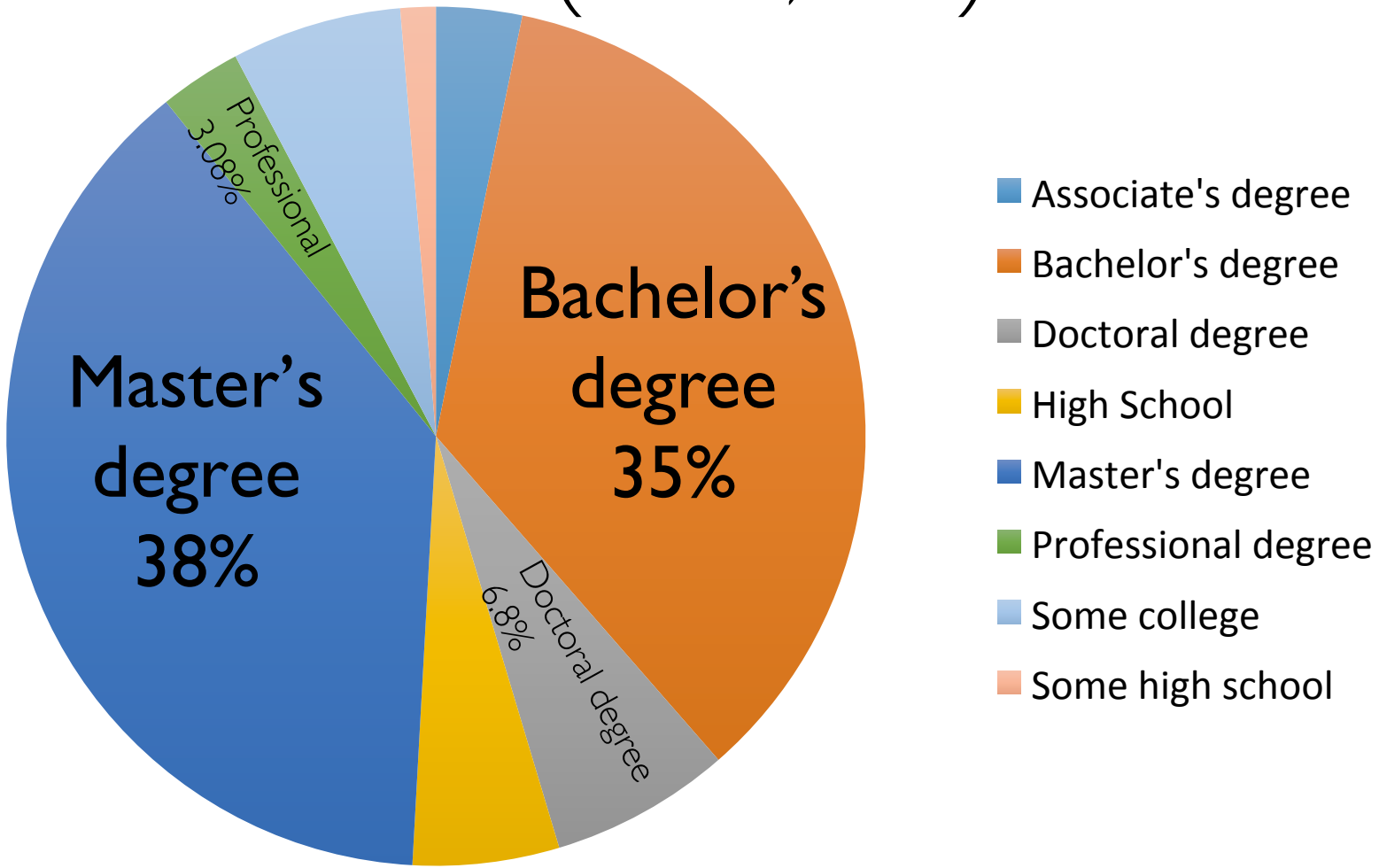
Similarity in findings

"In addition to being highly educated [79.4% have a Bachelor's degree or higher], the Coursera student population tends to be young [over 40% of MOOC students are under 30 years of age], male, and employed…"

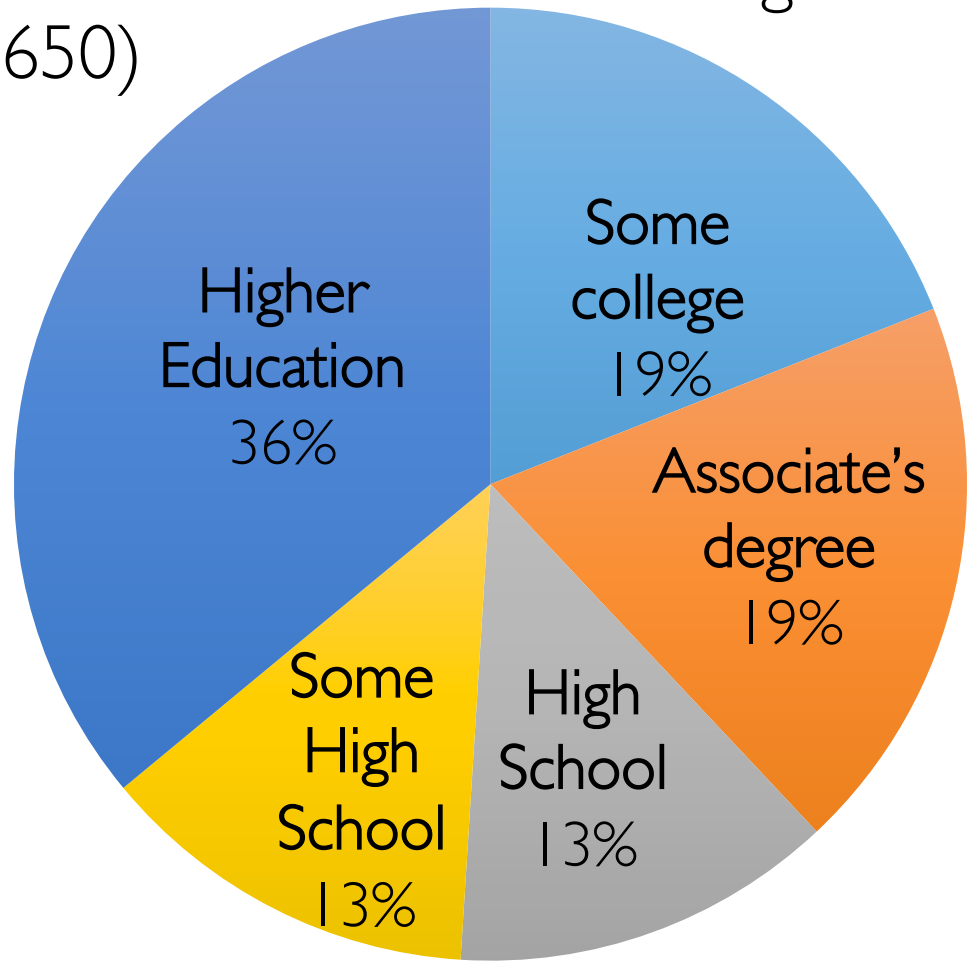
[Christensen, Steinmetz, Alcorn, Bennett, Woods, Emanuel, Working Paper 2013]

Demographics | Highest Degree Achieved Breakdown of all Students (N=6,708)

Over 70% of all students have a Bachelor's or Master's degree

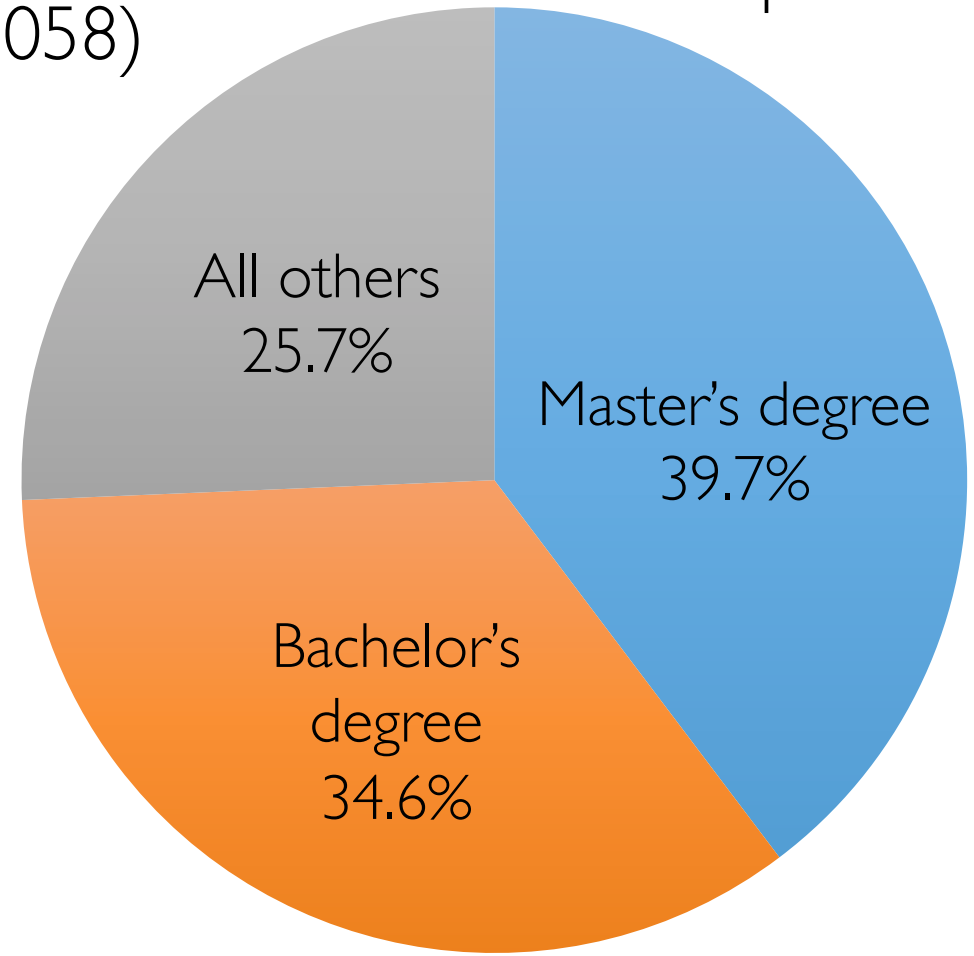


Educational breakdown of target (N=650)



Key takeaway: 64% of students that cannot afford a formal education have less than a 4-year college degree

Educational breakdown of comparison (N=6,058)



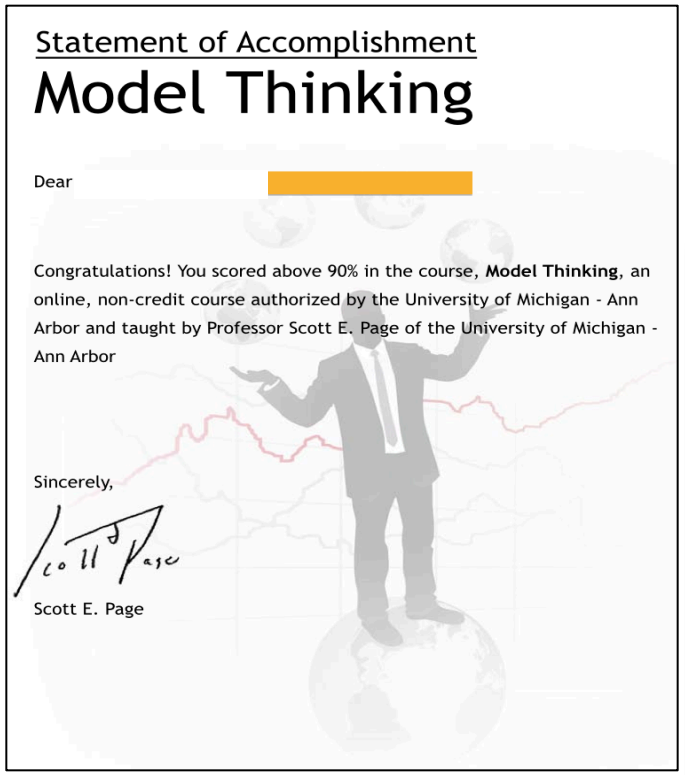
Over 70% of our comparison group have a Bachelor's or Master's degree

Motivations among our Target Population

Motivation of taking Model Thinking	Total N	% of target
1. General interest in the topic	571	87.5%
2. Professional development	460	70.55%
3. Extending current knowledge of the topic	330	50.77%
4. Interest in how these courses are taught	200	30.77%
5. Supplement other college /university courses	145	22.31%
6. Geographically isolated from educational institutions	137	21.08%
7.Decide if I want to take college/university classes	83	12.77%

Switched among comparison group

Performance and engagement



Statement of Accomplishment

Model Thinking

Dear

Congratulations! You scored above 90% in the course, **Model Thinking**, an online, non-credit course authorized by the University of Michigan - Ann Arbor and taught by Professor Scott E. Page of the University of Michigan - Ann Arbor

Sincerely,

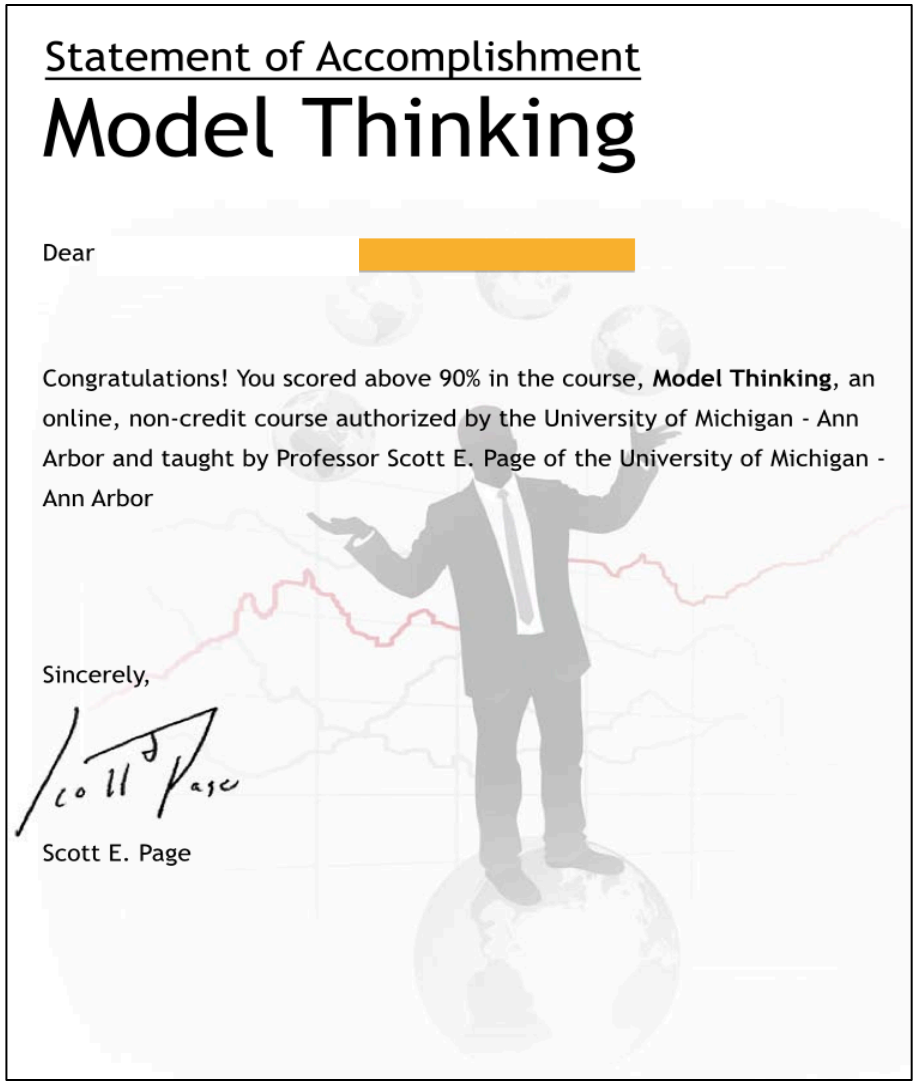
Scott E. Page

Image from: http://www.coursepad.org/

Student Performance

Out of the 38,411 registered students,

5.7% (N=2,176) completed the course and earned a statement of accomplishment



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Performance | Percentage earning a certificate by degree by degree

Degree type	Target	Comparison
Some high school	41.7% (N=5)	23.4% (N=18)
High school	32.7% (N=16)	30.3% (N=96)
Some college	22.5% (N=18)	23.9% (N=83)
Associate's degree (2 years of college)	26.2% (N=11)	28.7% (N=50)
Bachelor's degree (BA/BS, 4 years of college)	29.8% (N=81)	29.9% (N=626)
Master's degree	33.9% (N=56)	36.9% (N=884)
Professional degree (MD, JD)	10% (N=1)	23% (N=45)
Doctoral degree	47.2% (N=8)	37.9% (N=165)
Average	30.3%	32.6%

Engagement

No statistically significant differences between target and comparison groups

- Video viewing
- Forum participation
  - Threads
  - Posts
  - Comments

Image from: http://www.coursepad.org/

Summary of key points

- Demographics
- Current employment
- Highest level of education achieved
- Motivation
- Performance and engagement

Summary of key points

- Demographics
  - More likely to be male (70%)
  - More likely ages 25-34 (41%)
- Current employment
  - Less likely to be students
- Highest level of education achieved
- Motivation
- Performance and engagement

Summary of key points

- Demographics
  - More likely to be male (70%)
  - More likely ages 25-34 (41%)
- Current employment
  - Less likely to be students
- Highest level of education achieved
  - 64% of target group have less than a 4-year college degree
- Motivation
- Performance and engagement

Summary of key points

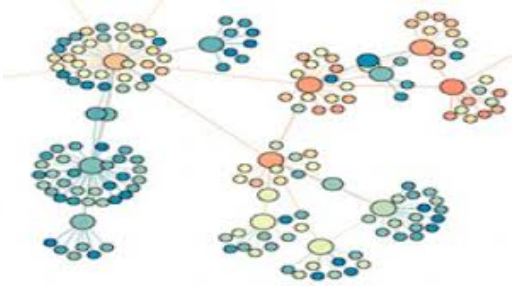
- Demographics
  - More likely to be male (70%)
  - More likely ages 25-34 (41%)
- Current employment
  - Less likely to be students
- Highest level of education achieved
  - 64% of target group have less than a 4-year college degree
- Motivation
  - No difference in groups' motivation
- Performance and engagement
  - 41.7% of those with some high school likely to receive a certificate of completion
  - No difference in course engagement between groups

Next steps

Repeat analysis for remaining UM

Coursera classes

- Introduction to Finance
- Social Networking Analysis
- Internet History, Technology, and Security
- Securing Digital Democracy
- Fantasy and Science Fiction



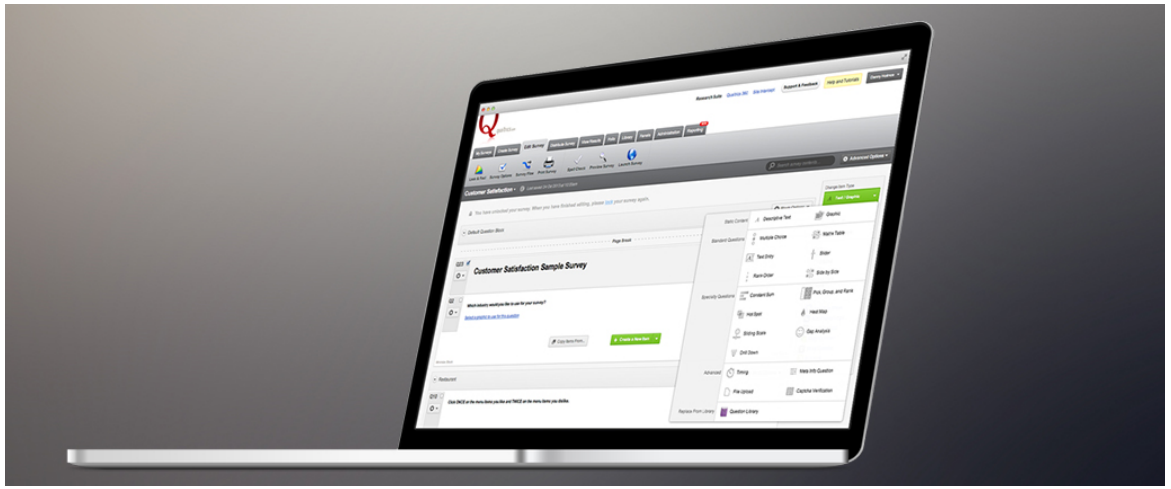
Next steps

Conduct interviews to understand if and how MOOCs are a platform for economic mobility among our target population

- Recruit participants (done)
- Identify eligible participants (done)
- Schedule interviews (in progress)

Participant Recruiting

- 3-minute survey
- Additional questions of motivation
  - Employment purposes
  - Training
  - Unable to afford a formal education
- Demographics
  - Income
  - Zip code
  - Race
  - Ethnicity
  - Disability
  - Age
  - Occupation



Survey Results

State	Surveys Sent	Current Responses	Current volunteers
Michigan, Ohio, Indiana	997	69 (6.8%)	27 (24.6%)
Pennsylvania, Kentucky, West Virginia, Illinois, Wisconsin, Iowa, Missouri, Kansas	5174	270 (5.2%)	92 (34%)
Total	6171	339	119 (35.1%)

What training do MOOCs provide that help you develop professionally?

"…My last finance class was over ten years ago. I need a refresher. MOOC provides that type of training for me."

"I think reading and critical thinking are skill that are developed in almost every course, and those skills seem universally helpful in most careers. There are a few specific courses that can also help me with my professional development."

"My school district is giving me 1 college credit for the courses which will advance me in the salary scale."

Why do you think that MOOCs **will** or **will not** help you in your future employment?

"I can put the skills learned on my resume."

"It shows self-motivation and positive use of time while unemployed."

"Employers value skills and knowledge. A piece of paper may get you in the door, but in a technical intereview, you still need to know what you are doing."

Do you have other motivations not listed above for enrolling in MOOCs?

"Attempt to re-take a class I've failed for credit, while learning the material without the penalty of a grade on my transcript."

"To see if the instructors at certain schools are good or not so that I might consider attending a school at that campus because of the quality of the instructors."

Interviews with individuals from Target group

- How have MOOC experiences affected employment or potential for employment?
- Are MOOCs resume boosters?
- What have been the most beneficial courses?
- How could MOOCs be more effective for employment?

Image from: http://www.nadinemuller.org.uk/the-new-academic-guides/academic-job-interviews/

Future work

- Analyze content of threads / comments for differences between groups
- Compare results across platforms (edX, Udacity, etc.)
- Understand ways to increase participation among our target population
  - Raised awareness (ways to leverage libraries, unemployment offices, radio, etc.)?
  - More offline and/or online groups?
- Which employers, if any, recognize employees taking MOOCs?

Acknowledgements

Contact information: tdillahu@umich.edu

- Chris Brooks
- Eric Koo
- Steve Lonn
- Tim O'Brien
- Martha Pollack

USE Lab
Digital Media Commons
www.umich.edu/~uselab

Athabasca University
CANADA'S OPEN UNIVERSITY

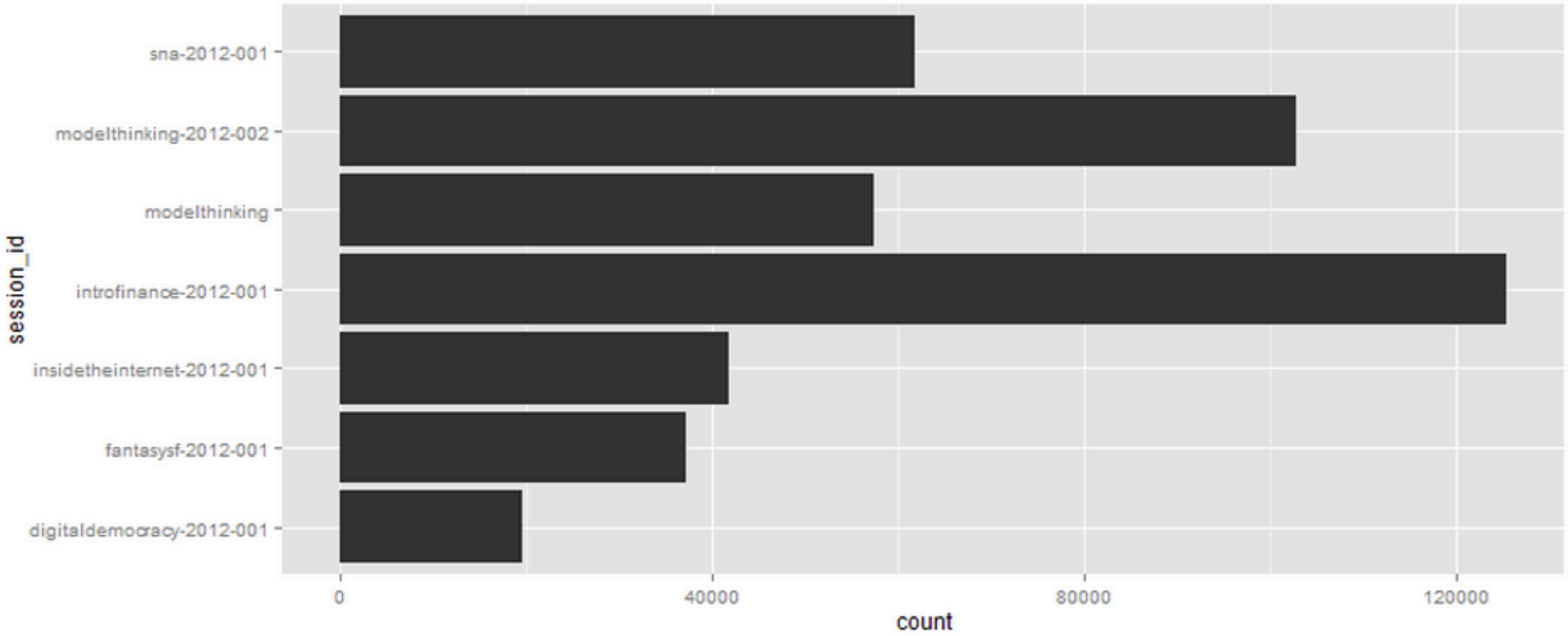
BILL & MELINDA GATES foundation

Questions, Feedback, Suggestions?

Contact information:
tdillahu@umich.edu
http://www.tawannadillahunt.com

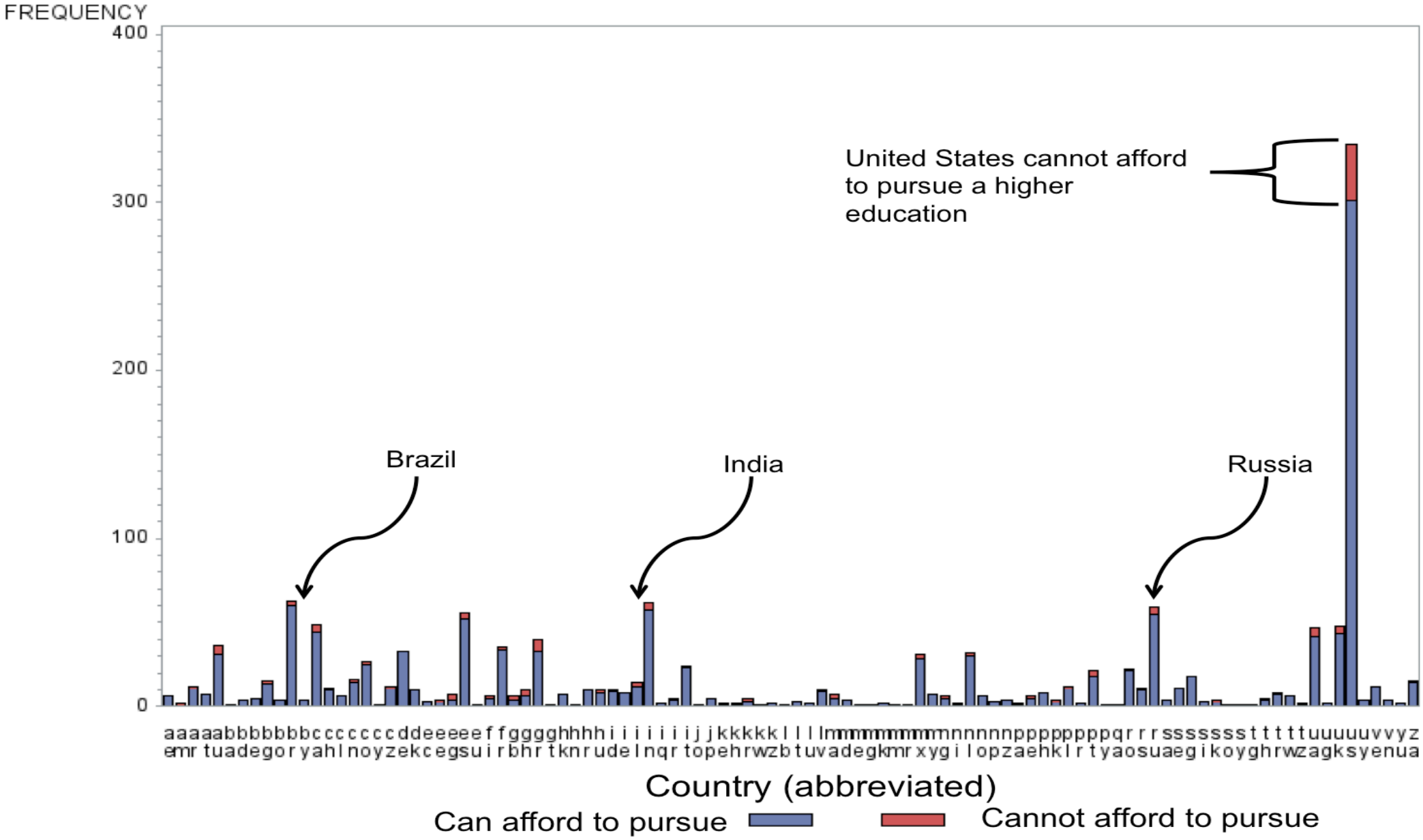
Backup slides

UM Enrollment Summary (2012 and 2013)

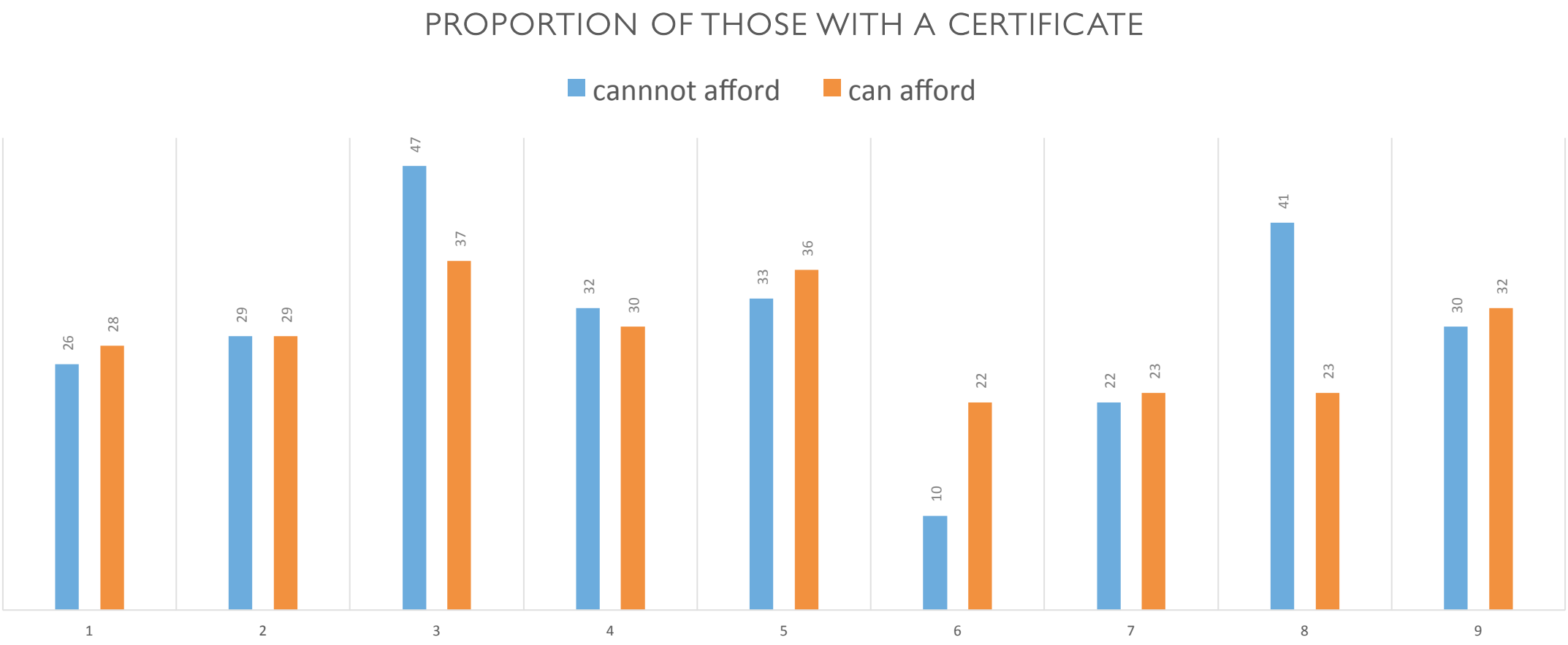


Education breakdown

a formal education)	Associate's degree (2 years of college)	Bachelor's degree (BA/BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school	Total
can afford	174 2.88	2093 34.63	437 7.23	320 5.29	2399 39.69	196 3.24	348 5.76	77 1.27	6044
cannot afford	42 6.49	272 42.04	17 2.63	49 7.57	165 25.5	10 1.55	80 12.36	12 1.85	647
Total	216 3.23	2365 35.35	454 6.79	369 5.51	2564 38.32	206 3.08	428 6.4	89 1.33	6691 100


FREQUENCY
400
300
200
100
0
United States cannot afford to pursue a higher education
Brazil
India
Russia
aaaaabbbbbbbcccccccddeeeeeffgggghhhhiiiiiiiijjkkkkkllllmmmmmmmmmnnnnnnpppppppppqrrrsssssssttttttuuuuuvvyz
emr tuadegoryahlnoyzekcegsuirbhrtknrudelnqrtopehrwzbtuvadegkmrxygilopzaehklrtyaosuaegikoyghrwzagksyenua
Country (abbreviated)
Can afford to pursue
Cannot afford to pursue

Percentage earning a certificate by degree



VIDEO VIEWING

- A table for the number of videos watched throughout the course
- Break down by whether lack finance and highest level of education
- "No response" stands for those who didn't answer a particular survey question, here it's either about their motivation taking modelthinking 2013 or their highest level of education.
- ANOVA test:

#of videos watched ~ cannot_pay+education+cannot_pay*education

Nothing is significant at the 5% level.

- But eyeball metrics seems to suggest more videos are watched in the group lacking financial resources.

Percentage of video viewing

	No Response	Associate's degree (2 years of college)	Bachelor's degree (BA/BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school
Can Afford	45.74%	35.87	41.26	49.78	37.67	46.64	41.26	34.98	2.24
Cannot Afford	9.42	40.36	40.81	50.22	43.05	49.33	26.01	34.09	41.70
No Response	29.60	NA	43.05	32.287	23.77	47.98	NA	NA	NA

Forum

- Threads: number of threads created
- Posts: number of posts made
- Comments: number of forum comments made
- ANOVA test for each of the three above is not significant at the 5% level
- Eyeball metrics do suggest some kind of difference in the amount of activities on the forum among groups.

Average Number of COMMENTS

	No Response	Associate's degree (2 years of college)	Bachelor's degree (BA/BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school	Subtotal
Can Afford	#N/A	1	2	2	1	3	3	2	1	15
Cannot Afford	#N/A	2	3	1	1	2	#N/A	4	1	15
No Response	#N/A	#N/A	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	

Average Number of Posts

	No Response	Associate's degree (2 years of college)	Bachelor's degree (BA/BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school	Subtotal
Can Afford	6	1	2	2	2	3	2	3	1	17
Cannot Afford	#N/A	3	2	3	2	4	2	5	5	26
No Response	#N/A	#N/A	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	

Average Number of Threads

	No Response	Associate's degree (2 years of college)	Bachelor's degree (BA/BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school	Subtotal
Can Afford	6	1	2	2	2	3	2	3	1	17
Cannot Afford	#N/A	3	2	3	2	4	2	5	5	26
No Response	#N/A	#N/A	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	

Do these findings generalize?

http://www.slate.com/articles/life/education/2013/11/sebastian_thrun_and_udacity_distance_learning_is_unsuccessful_for_most_students.html

NEW SLIDES ON COURSE COMPLETION

				can afford	cannot afford	no response	Subtotal	The chance of certificate(i.e. the proportion of those with a certificate for finishing the course), for each education degree group, given that you cannot afford a formal education	The chance of certificate, for each education degree group, given that you can afford a formal education
No Statement of Accomplishment		No Response		16	3	8	27		
		Associate's degree (2 years of college)		124	31	0	155		
		Bachelor's degree (BA/BS, 4 years of college)		1465	191	1	1657		
		Doctoral degree		270	9	1	280		
		High school		221	33	3	257		
		Master's degree		1511	109	3	1623		
		Professional degree (MD, JD)		151	9	0	160		
		Some college		264	62	1	327		
		Some high school		59	7	0	66		
		subtotal		4081	454	17	4552		
Statement of Accomplishment		No Response		10	0	0	10		
		Associate's degree (2 years of college)		50	11	0	61	0.261905	0.287356
		Bachelor's degree (BA/BS, 4 years of college)		626	81	1	708	0.297794	0.299378
		Doctoral degree		165	8	1	174	0.470588	0.37931
		High school		96	16	0	112	0.326531	0.302839
		Master's degree		884	56	1	941	0.339394	0.369102
		Professional degree (MD, JD)		45	1	0	46	0.1	0.229592
		Some college		83	18	0	101	0.225	0.239193
		Some high school		18	5	0	23	0.416667	0.233766
		subtotal1	(No response not included)	1967	196	3	2166	0.301538	0.325231
		subtotal2		6048	650	20	6718		

	No Response	Associate's degree (2 years of college)	Bachelor's degree (BA/ BS, 4 years of college)	Doctoral degree	High school	Master's degree	Professional degree (MD, JD)	Some college	Some high school
Can Afford	102	80	92	111	84	104	92	78	5
Cannot Afford	21	90	91	112	96	110	58	76	93
No Response	66	NA	96	72	53	107	NA	NA	NA