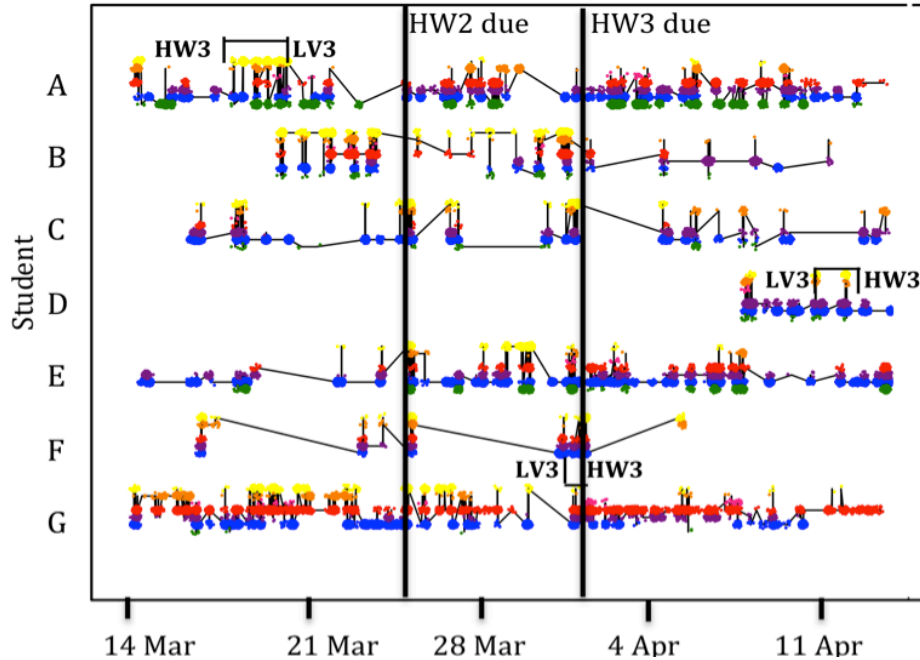# MOOC Research

What we know and what we would like to find out

A presentation for the International Symposium
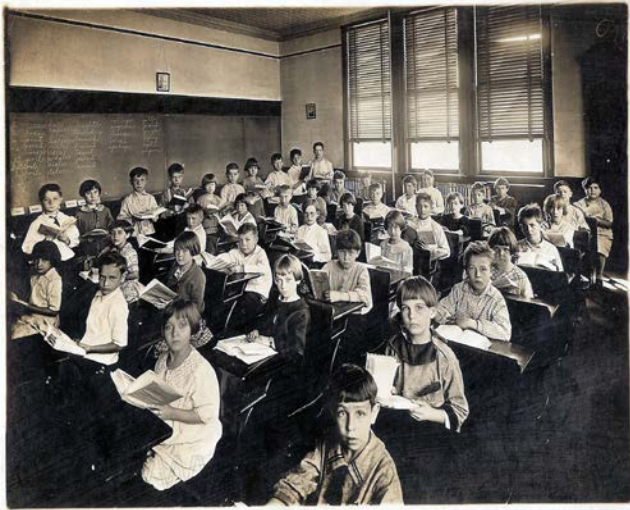*Emerging Models of Learning and Teaching in Higher Education:*
From Books to MOOCs?

Dr. Lori Breslow
MIT Teaching and Learning Laboratory

Graph courtesy of Professor Jennifer DeBoer, Purdue University

The book changed . . .

The computer changed . . .

More information, coming faster, from a more diverse group of people

+

= ?

From 154,000+ registrants to 7,000+ certificate earners in 6.002x (spring '12)

8,240
Took the Final

7,157
Certified

9,318
Passed the Mid-Term

10,547
Made it the Mid-Term

26,349
Tried the First Problem Set

154,763

Registered for 6.002x: Circuits and Electronics
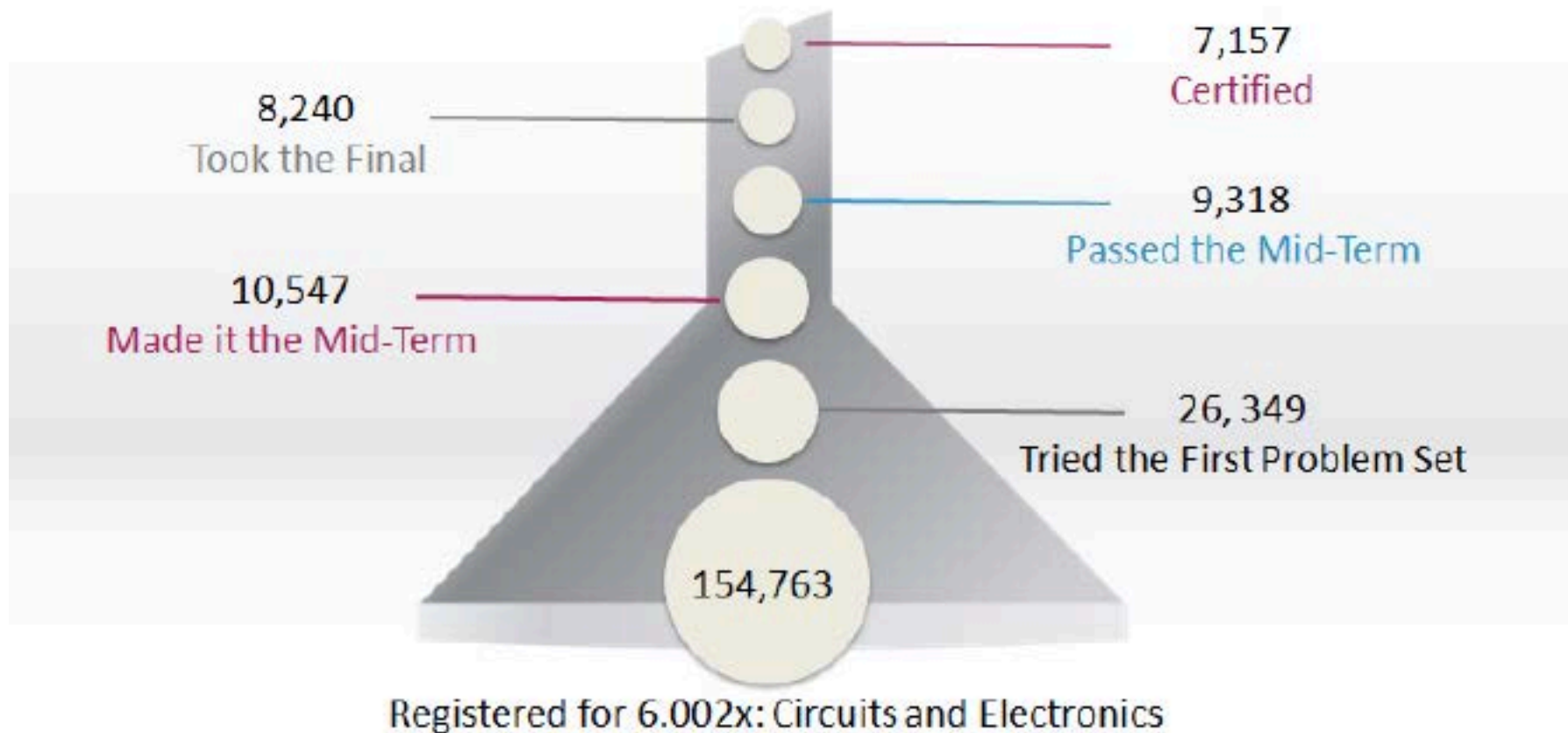
Source: edX

Most survey respondents reported being in their 20s or 30s
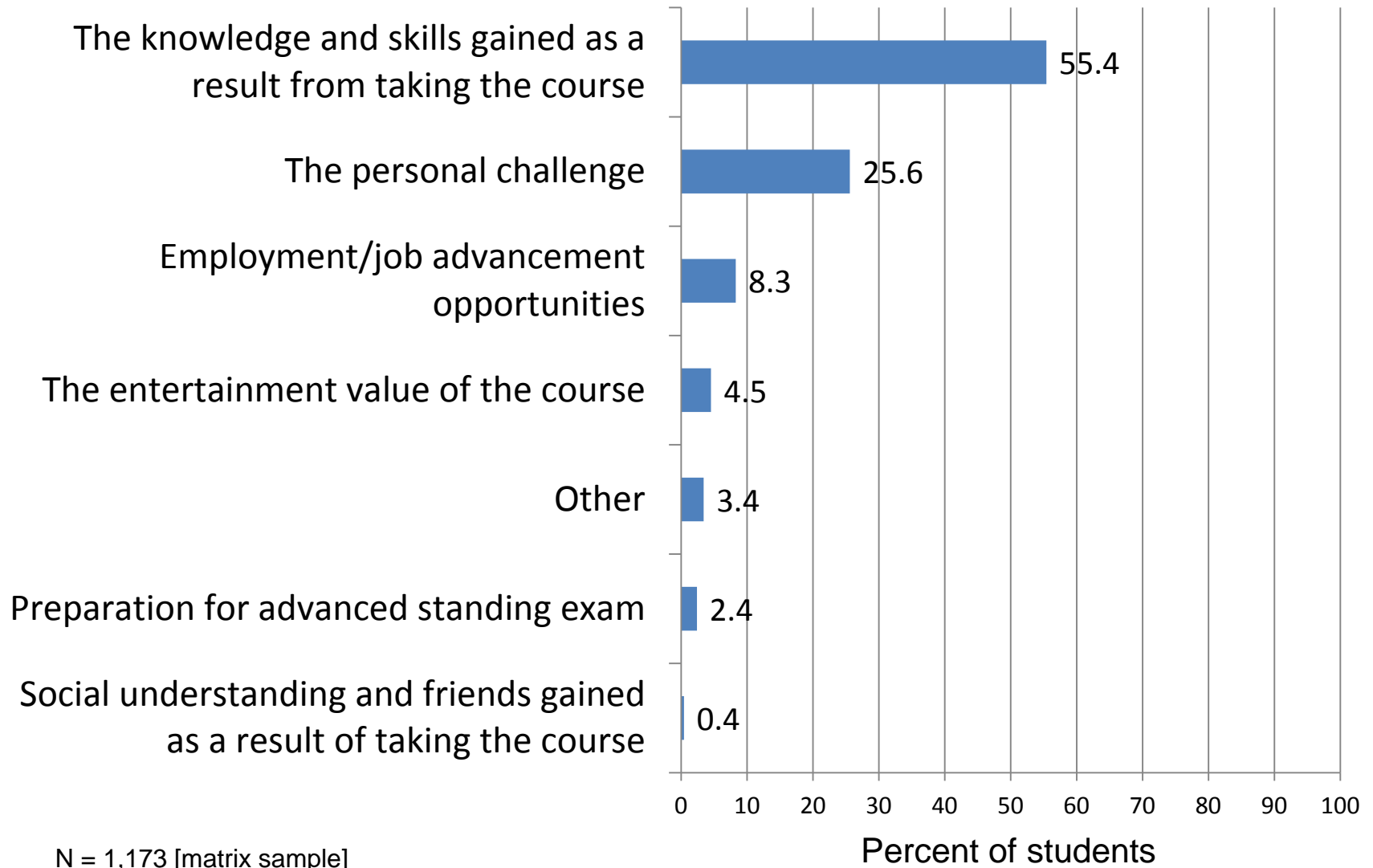
88% were male
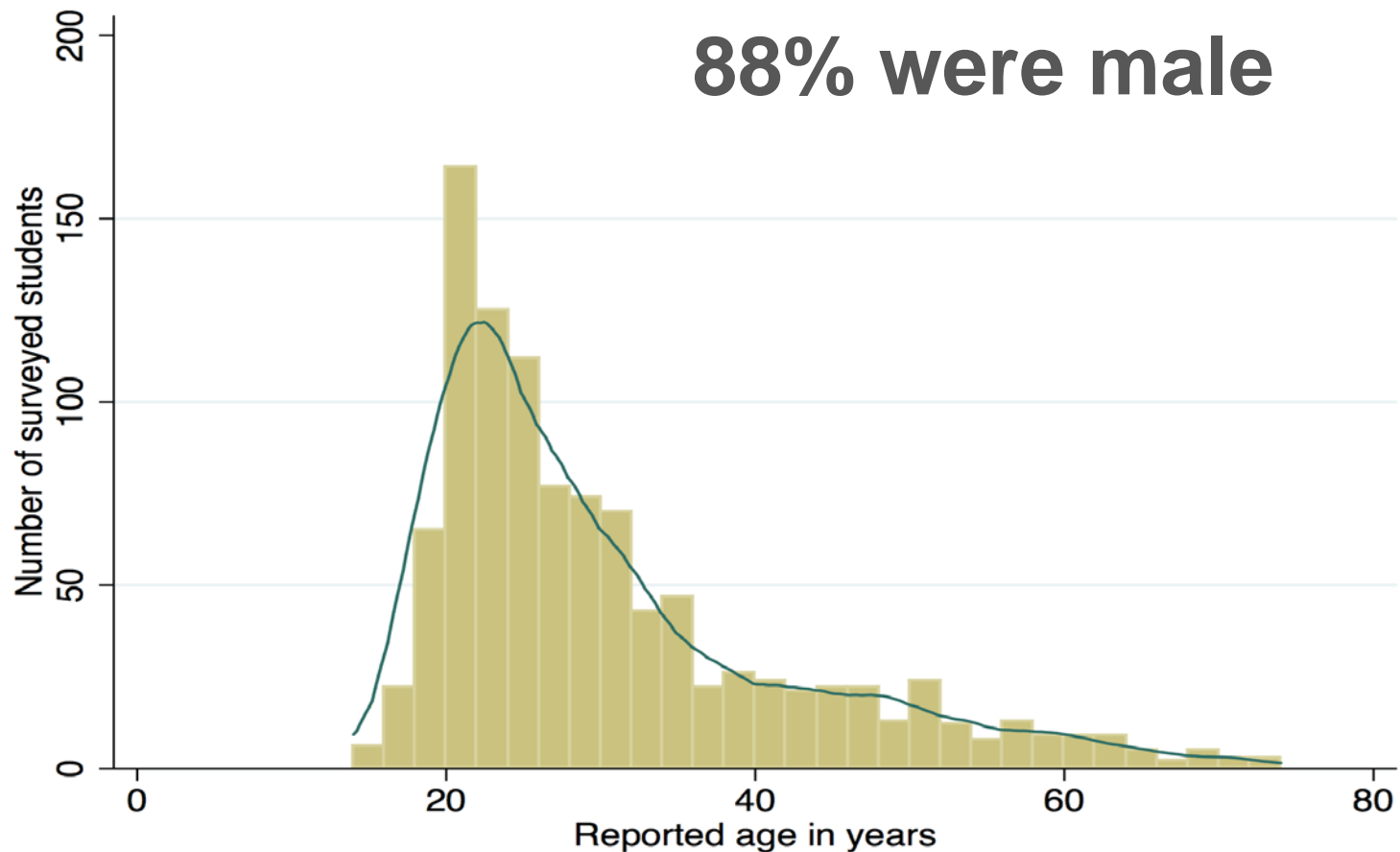
N = 1,116

Analysis by Dr. Jennifer DeBoer

Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. T. (2013). Studying learning in the worldwide classroom. *Journal of Research and Practice in Assessment,* http://www.rpajournal.com

Primary reason for enrolling

The knowledge and skills gained as a result from taking the course — 55.4

The personal challenge — 25.6

Employment/job advancement opportunities — 8.3

The entertainment value of the course — 4.5

Other — 3.4

Preparation for advanced standing exam — 2.4

Social understanding and friends gained as a result of taking the course — 0.4

Percent of students

N = 1,173 [matrix sample]

Analysis by Dr. Jennifer DeBoer
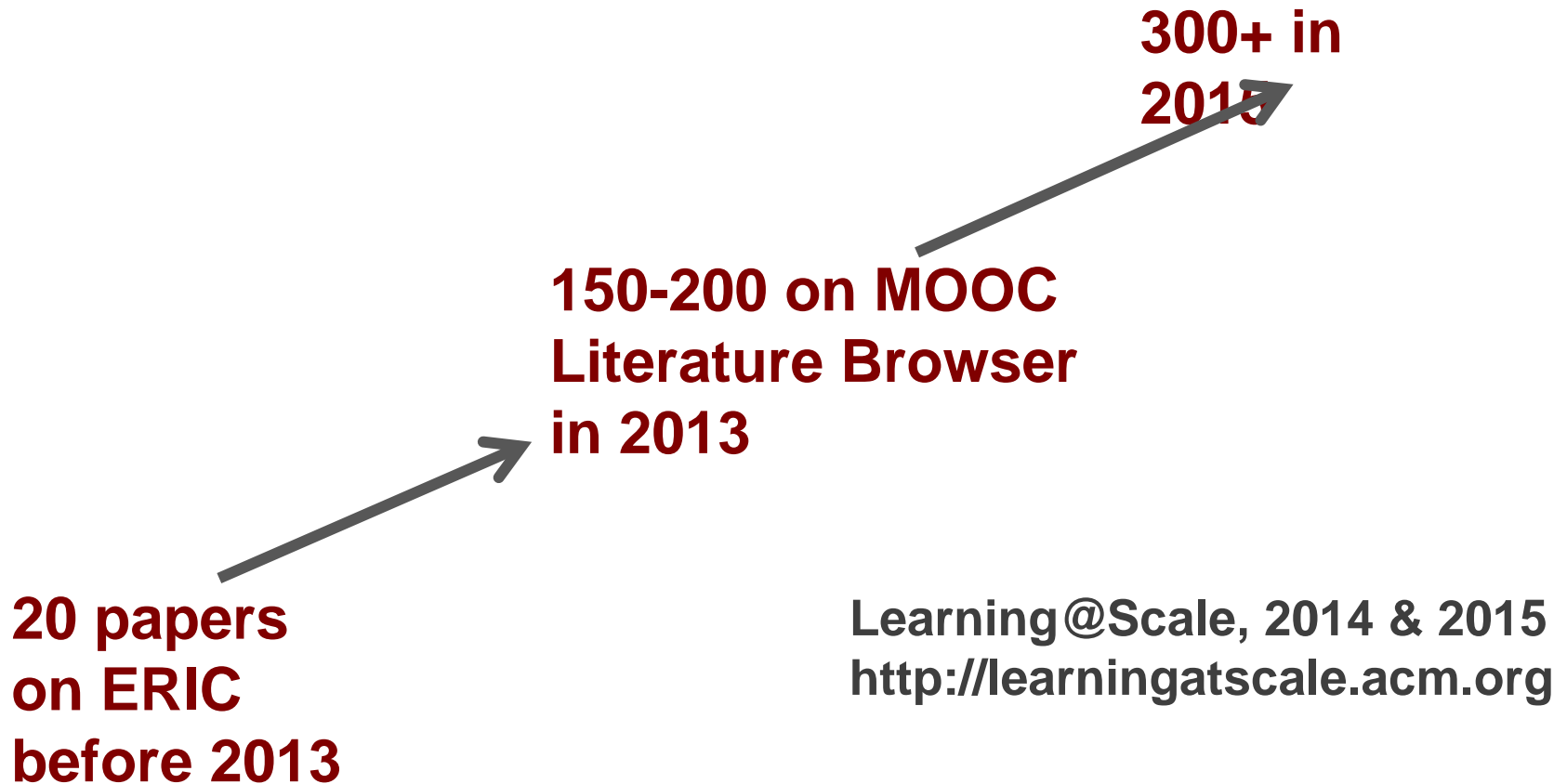
Relations between background and achievement in full-points model

- **Reason for enrolling**   **None**

- **Age**   **None**

- **Gender**   **None**

- **Parental/home background**   **None**

- **Degree level**   **Marginal**

- **Level of calculus**   **Positive**

* **Work off line with someone else**   **Positive**

Analysis by Dr. Jennifer DeBoer

An outpouring of research

300+ in 2015

150-200 on MOOC Literature Browser in 2013

20 papers on ERIC before 2013

Learning@Scale, 2014 & 2015
http://learningatscale.acm.org

MRI Classification

- Student engagement & learning success

- MOOC design & curriculum

- Self-regulated learning & social learning

- Social network analysis & networked learning

- Motivation, attitude & success criteria

Gašević, G. Kovanović, V., Joksimović, S., & Siemens, G. (2014). Where is research on Massive Open Online Courses Headed? A Data Analysis of the MOOC Research Initiative. *The International Review of Research in Open and Distributed Learning* 5(15), http:http://www.irrodl.org/index.php/irrodl/article/viewFile/1954/3111.
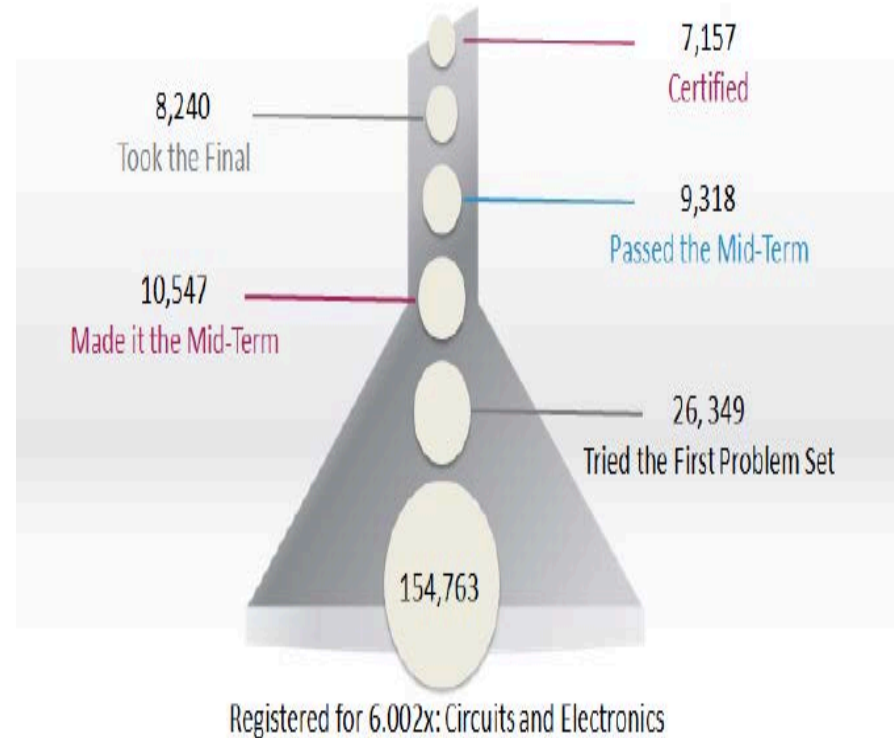
Breslow & DeBoer Classification

- **Persistence**

- **Pedagogy**

- **Discussion forums**

- **Analytics/methodologies**

- **The MOOC phenomena itself**

DeBoer, J. & Breslow, L. (2015). Understanding the general utility of online resources for achievement in a MOOC, forthcoming.

Persistence

By a conventional understanding . . .

MISERABLE

− But what's the denominator?
− Isn't 7,157 still pretty impressive?

7,157
Certified

8,240
Took the Final

9,318
Passed the Mid-Term

10,547
Made it the Mid-Term

26,349
Tried the First Problem Set

154,763

Registered for 6.002x: Circuits and Electronics

Source: edX spring 2013

See DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing "course": Reconceptualizing educational variables for massive open online courses. *Educational Researcher*, *43*(2), 74-84; and Koller, D., Ng, A., Do, C., & Chen, Z. (2013). Retention and intention in massive open online courses: In depth. *Educause Review*, *48*(3), 62-63.

Pedagogy

Most studies have been in the service of persistence:

- Assign students to small groups based on correct answers **(Hearst, *et al*.)**

- Intervene when students disappear **(Krumm, *et al*.)**

- Crowd source coding assignments **(O'Reilly, *et al*.)**

- Form co-located study groups **(Li & Dillenbourg)**

- Send messages to increase "stickiness" **(Kotturi, *et al*.)**

Discussion Forums

- **What's on them? (Cui & Wise)**

- **Who uses them? (Enyon, *et al*.)**

- **To what effect? (Huang, *et al*.; Shillair & Walsh)**

- **How can they be used to their best advantage? (Stump, *et al*.; Ertmer, *et al*.)**

Analytics

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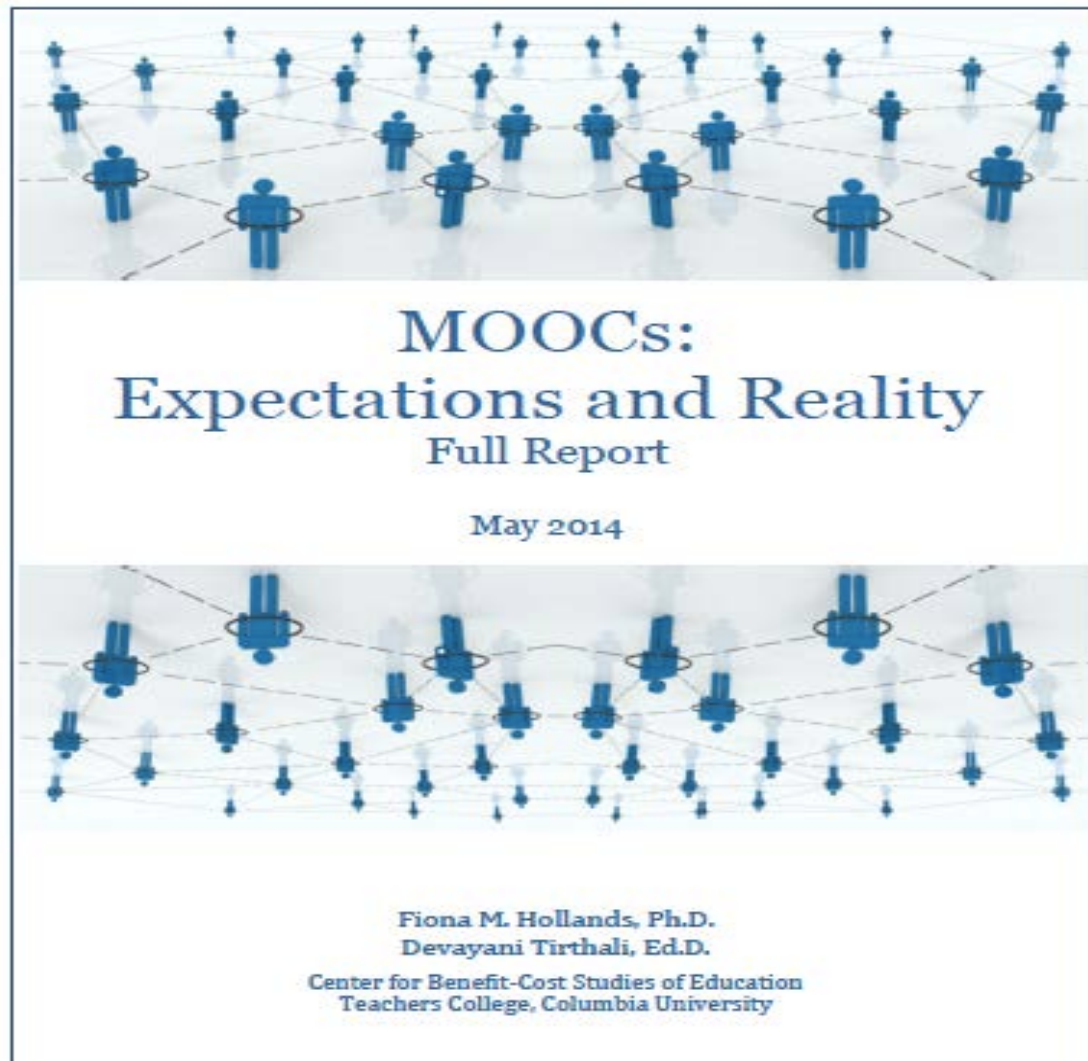
Tracking log courtesy of Xin Chen

Emerging Models of Learning and Teaching in Higher Education   **May 2015**

Analytics/Methodology

- Predicting student success from
  - Demographics **(Brooks, *et al*.)**
  - Wheel-spinning **(Gong & Beck)**
  - Navigation/activity patterns **(Guo)**
  - Discussion forums **(Yang, *et al*.)**
- Methods include
  - Structural Topic Model **(Reich)**
  - Latent Dirichlet Allocation **(Coleman, *et al*.)**
  - A/B testing **(Tomkin & Charlevoix)**
  - Text & graphic clustering **(Yang & Rose)**

The MOOC Phenomenon

MOOCs:
Expectations and Reality
Full Report

May 2014

Fiona M. Hollands, Ph.D.
Devayani Tirthali, Ed.D.

Center for Benefit-Cost Studies of Education
Teachers College, Columbia University

What should we know?

Will MOOCs, as originally conceived, be viable in the future?

What should we know?

- ## If yes
  - How do we increase persistence?
  - How do we know what/if students are learning?
  - How can we make better use of technological affordances?

- ## If no, data can still tell us about
  - What are common misconceptions (in specific fields) & ways of addressing them?
  - How can we link concepts in different contexts?
  - What rhetorical moves can instructors & students make to improve social learning?

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