



The Online Revolution: Education for Everyone

Daphne Koller
Stanford University & Coursera

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Human-Computer Interaction
University of California, San Diego, Oct 7th



Securing Digital Democracy
University of Michigan, Oct 7th

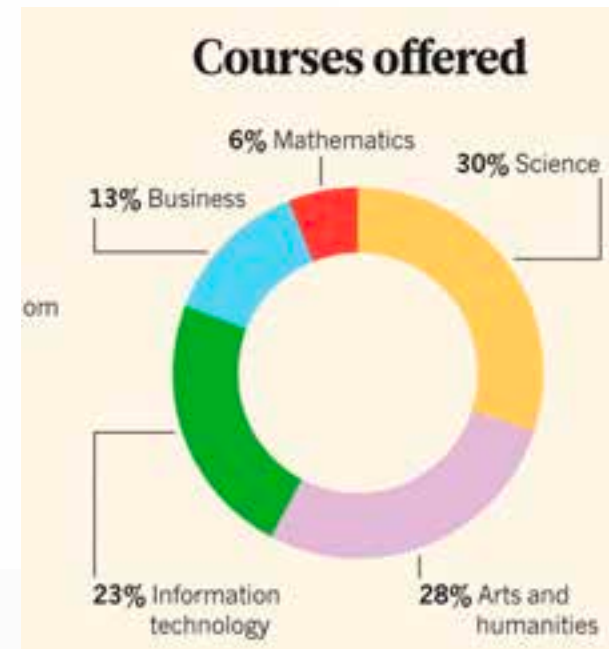


Sustainable Agricultural Land Management
University of Florida, Oct 7th



35 of the top 60 universities worldwide, including the #1 or #2 ranked university in 15 countries.

	<p>UNIVERSITY OF MARYLAND, COLLEGE PARK</p> <p>E-learning and Digital Cultures Jeremy Knox, Sian Boyne, Harriah Macleod, Jen Ross, Christine Sinclair</p>	<p>Jan 28th 2013 5 weeks long</p>
	<p>UNIVERSITY OF EDINBURGH</p> <p>Introduction to Philosophy Dove Ward, Duncan Pritchard, Michela Massimi, Sullin Lavelle, Matthew Chrisman, Allan Hazlett, Alexander Richmond</p>	<p>Jan 28th 2013 7 weeks long</p>
	<p>UNIVERSITY OF EDINBURGH</p> <p>The Social Context of Mental Health and Illness Charmaine Williams</p>	<p>Jan 28th 2013 8 weeks long</p>
	<p>UNIVERSITY OF TORONTO</p> <p>Critical Thinking in Global Challenges Celine Coqueneau, Mayank Dutta</p>	<p>Jan 28th 2013 5 weeks long</p>
	<p>UNIVERSITY OF EDINBURGH</p> <p>Introduction to Computer Networks Arvind Krishnamurthy, David Wetherell, John Zahorjan</p>	<p>Jan 28th 2013 10 weeks long</p>
	<p>UNIVERSITY OF WASHINGTON</p> <p>Grow to Greatness: Smart Growth for Private Businesses, Part I Edward D. Hess</p>	<p>Jan 28th 2013 5 weeks long</p>



The Humanities, Sciences, Engineering, Business,

	<p>GEORGIA INSTITUTE OF TECHNOLOGY</p> <p>Astrobiology and the Search for Extraterrestrial Life Charles Cockell</p>	<p>Jan 28th 2013 5 weeks long</p>
	<p>UNIVERSITY OF EDINBURGH</p> <p>Financial Engineering and Risk Management</p>	<p>February 2013</p>



I was devastated as I had left my job and was finding out new directions in life. I wanted to go back to academics and could not find a way to do so. One of my friend recommended Coursera and it was like a new life to me. I was thrilled to see so many courses and so many ways of learning. Thanks to Coursera, I got admission into one of the premier schools in my country and I could continue my academics. (Aarti, India)

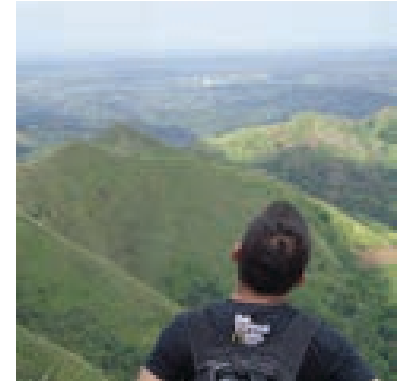
Two years ago I felt incredibly miserable. I am coming from a traditional family - so I married young and all my life I was either pregnant, breastfeeding or both.

I knew that I am talented, but all I had in life was cleaning, feeding, cleaning, feeding, working part time... I wanted very much to study like my classmates ... but it was very hard to find time. I started and left, started and left. I was deeply depressed. There was a moment ... when I tried to kill myself. But we - humans are very tenacious of life and I survived.

At that time I found Coursera. My first course called the "game theory" expelled the depression and the desire to die once and forever. I feel happy and I enjoy my life and my family much more. In the last two years I have taken about 40 courses (I am



I grew a lot from answering the longer quizzes and wrestling with the complex essay grading rubrics... you are not only allowing autistic people to learn, but actually diminishing the severity of the illness itself. (*Daniel Bergmann, USA*)



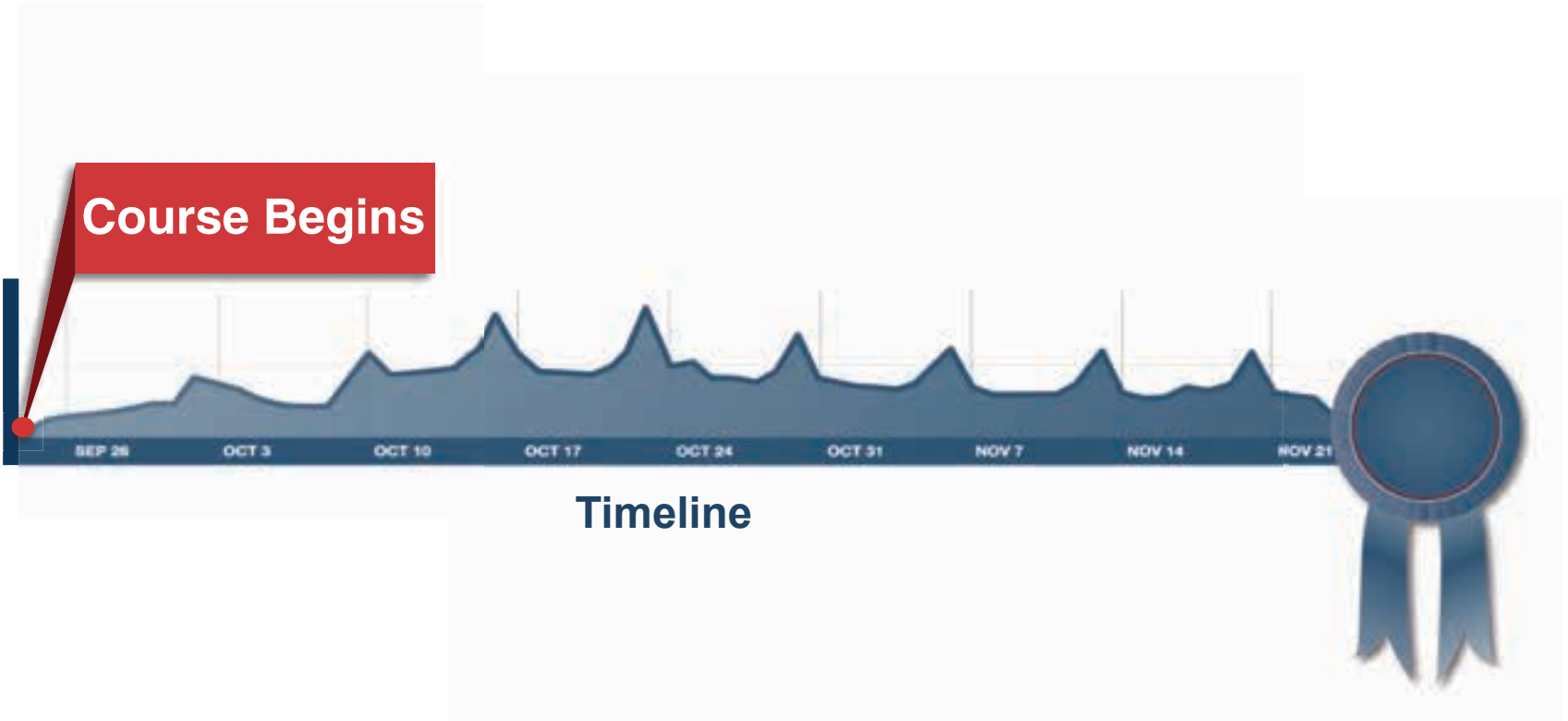
I took the class on Experimental Genome Science... The course was very, very challenging, I had to do some of the coursework during lunch at work ... There's a different kind of commitment needed in taking online courses. There is a stronger sense of personal integrity required for it... I got into an interview for a job I really desire, and I mentioned that I was taking the Experimental Genome Science course. Now, I have a new job evaluating genomic research proposals. Funny how that works. *(Jose, Philippines)*

The Student Experience

users on site

100K
50K

Course Begins



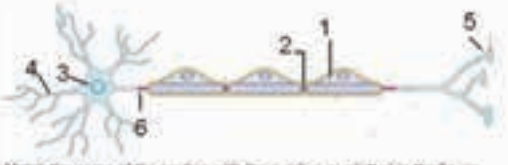
Timeline

Real Course



Multiple choice

Question 1



Match the name of the section with the number as plotted in the figure

AIS – Axon Initial Segment

Short answer (regular expression)

Who discovered the theory of general relativity?

Submit

Computer programs

```
image = new SimpleImage("puzzle-copper.png");  
  
for (pixel: image) {  
    // your code here  
    pixel.setRed(0);  
    pixel.setGreen(pixel.getGreen() * 100);  
    pixel.setBlue(pixel.getBlue() * 100);  
}  
  
print(image);
```

Run

Math expressions

Question 1

What is the derivative of $\frac{\sin(x)}{x}$ w.r.t. x ?

Preview

Your submission is equivalent to: $\frac{x \cos(x) - \sin(x)}{x^2}$

Autograded Homeworks and Exercises



Introductory Physics I with Laboratory
by Dr. Michael F. Schatz

Online Labs

An Introduction to Interactive Programming in Python

by Joe Warren, John Greiner, Stephen Wong, Scott Rixner



The image shows a web browser window with two main panels. The left panel is a code editor displaying Python code for a game. The code includes class definitions for a player and a planet, and a main function that initializes the game. The right panel is a game window titled "AstroBlox" showing a space-themed scene with several blue planets and a score of 0. The game window also has a "Lives" counter showing 2. Below the game window, there are two input fields: "Key Up" and "Mouse Click 540, 478".

Share and run code in the browser

- Home
- Discussion Forums
- Video Lectures
- Problem Sets
- Programming Questions
- Theory Problems
- Syllabus
- Course Logistics
- Final Exam

Feedback — Problem Set-1

You submitted this quiz on **Thu 8 Aug 2013 12:51 PM PDT (UTC -0700)**. You got a score of **6.90** out of **8.00**. You can attempt again in **1 minutes**.

Question 1

3-way Merge Sort: Suppose that instead of dividing in half at each step of Merge Sort, you divide into thirds, sort each third, and finally combine all of them using a three-way merge subroutine. What is the overall asymptotic running time of this algorithm? (Hint: Note that the merge step can still be implemented in $O(n)$ time.)

Your Answer	Score	Explanation
$n \log(n)^2$		
$n^2 \log(n)$		
$n \log(n)$		
<input checked="" type="radio"/> n	3.00	How many levels of recursion are there? How much work is done at each level?
Total	3.00 / 1.00	

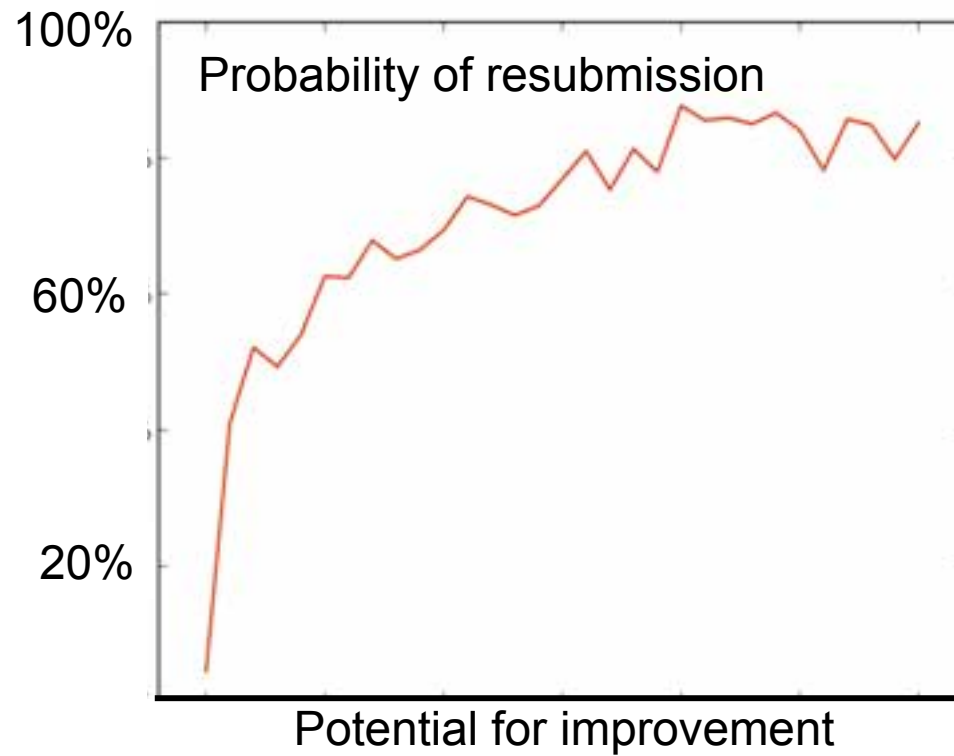
Question 2

You are given functions f and g such that $f(n) = O(g(n))$ is $f(n) = \log_2(O(n)^c) = O(g(n) + \log_2(O(n)^c))$ (Here c is some positive constant.) You should assume that f and g are nondecreasing and always bigger than 1.

Your Answer	Score	Explanation
Sometimes yes, sometimes no, depending on the constant c .		
False		
True		



Instant feedback



Students who engage in mastery-based learning do better on the exam

Self-Induced Mastery

Evaluation criteria & Grading rubric

Grade value 40 points

Grading questions	0-25 points	26-35 points
Did you make external prototypes of two ideas? Points off if the prototype is too formal, like a rough rule of thumb, a detail-oriented computer mock-up or too formal. (max. 20)	From 1 to 2 prototypes, informal prototypes, consistently formally.	Two prototypes, created rapidly.
Did you test your prototype with at least 5 (5) if the activity is long, users testing in a real test? (max. 20)	0-7 Not ready	Yes. With real users who were testing in a real test.

Photos of your prototypes



Evaluation

Did the student make external prototypes of two ideas? Points off if the prototype is too formal, like a rough rule of thumb, a detail-oriented computer mock-up or too formal. (max. 20)

- 0-25 points: From 1 to 2 prototypes, informal prototypes, consistently formally.
- 26-35 points: Two prototypes, created rapidly.

Comments

Photos of your prototypes



Evaluation

Did the student make external prototypes of two ideas? Points off if the prototype is too formal, like a rough rule of thumb, a detail-oriented computer mock-up or too formal. (max. 20)

Aggregate score: 27.5

Comments:

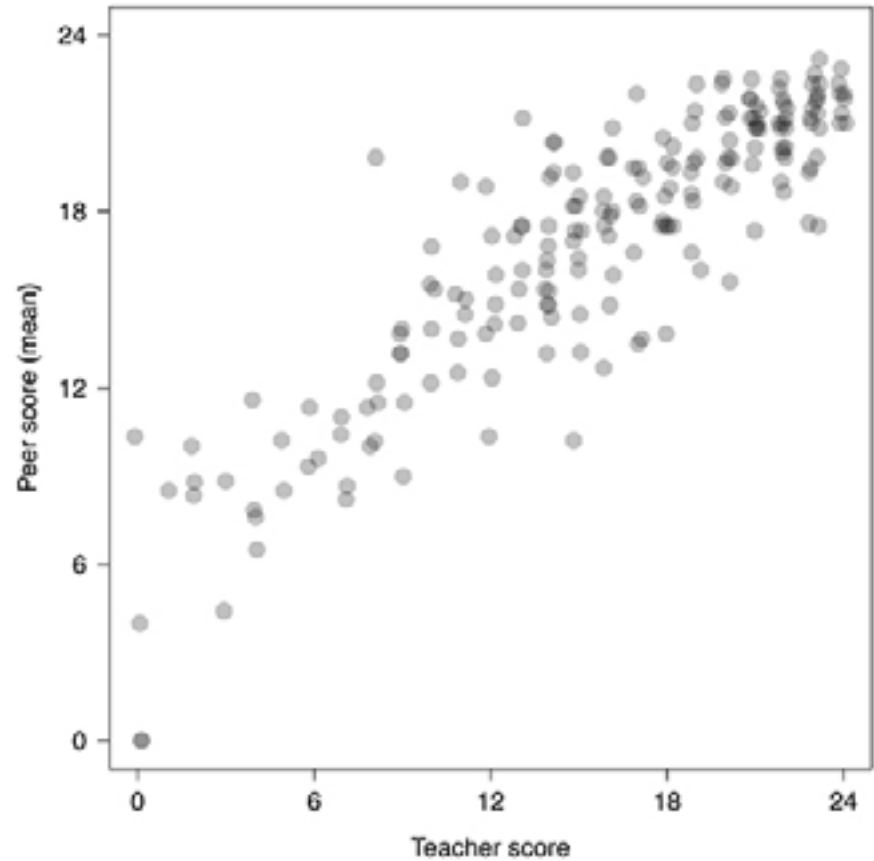
- student1:** Your prototypes were at the right level of formality.
- student2:** I'm glad you chose to highlight the navigation buttons and de-emphasized the less important actions.
- student3:** You clearly put a lot of effort, but the assignment asked a high-level prototype, and your submission had too much detail.
- student4:** pretty good
- student5:** I was a bit confused about which parts of your 2nd prototype to focus on. The professor said a good external prototype doesn't show details for views that don't impact the flow of the UI.

Peer Grading



Mitch Duneier
Princeton

Analysis by:
Matthew Salganik & Mitch Duneier
Princeton University Sociology Dept.



Peer Grading



Karl Ulrich



LaPtabel
laptop table



Ramaswamy Venkatachalam
Gujarat, India

DuoSlim
portable device holder



Aranzazu Hurtado Ruiz
Madrid, Spain

Neo-WD
space-efficient workdesk



Paul Mendoza
Manila, Philippines

From Knowledge to Action



Synapses, Neurons and Brains

by Idan Segev,



Home

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Information storage

Subscribe for email updates.

Sort replies by: **Oldest first** Newest first Most popular

No tags yet. + Add Tag

Student 1

The problem summary:

How is the information stored in our brain? As in computers we use potentials, or magnetization for example to make an array of binary code (1 or 0), what is the analogous in the brain?

Steps to rep

-We have w
real time, pe

-The questi
would be the
memories? S
and where in

Actually
accurate
really ju

Comments:

Thank you so much. S
this topic or is some

Student 2

Student 3

Student 4

Maybe i
really do
may cha

https://
said, but
maybe I'm
activated,
female th

Perhaps

Within the huma

I'm also curious h

each one and tes

Anonymous - 20 hours ago

- 5 minutes ago

I've already worked a lot on this before starting with this course (nonetheless I learned a lot of details in the course). One of the most interesting papers I found is that information is represented feature based <http://www.cs.rochester.edu/users/faculty/idan/tahtaj.pdf>. I've already tried around building some small information processing algorithms based on this. If you are interested we could probably talk a bit about it.

James Tremblay - 1 day ago

Maybe information is NOT stored in the brain. It certainly isn't stored in the same way that a computer stores information. Researchers really don't know the details of memory, and as has been shown with many experiments, there are lots of ways in which our memories may change (over time, according to how they are allocated in the first place, etc.). Memories may be figuratively "stored" in a distributed network that is more about the connections between particular groups of neurons and what kinds of inputs cause those networks to be excited.

Actually my master's thesis was in part about working memory and how the idea of it now seems outdated and doesn't seem very

Community

ok, so new tags won't appear immediately in this page


COURSERA

The Hebrew University of Jerusalem

Synapses, Neurons and Brains
by Idan Segev

Synapses, Neurons and Brains Students Map

Tag yourself in our map here: <http://goo.gl/maps/XaCWD>



Note that we update this map every week, so new tags won't appear immediately in this page

[Instructor Help Articles](#)

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Earn a Verified Certificate

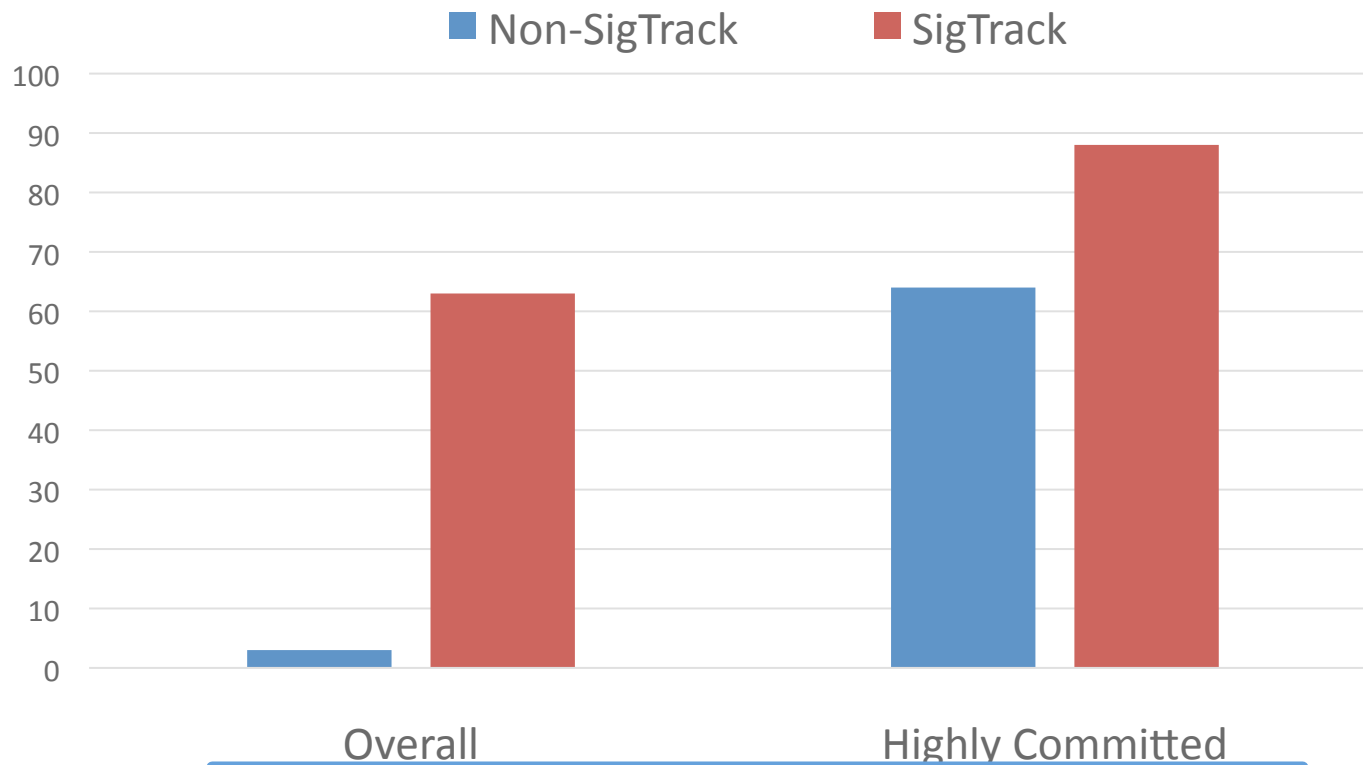
Earn official recognition from Duke University and Coursera for your accomplishment with a verifiable electronic certificate.



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Signature Track

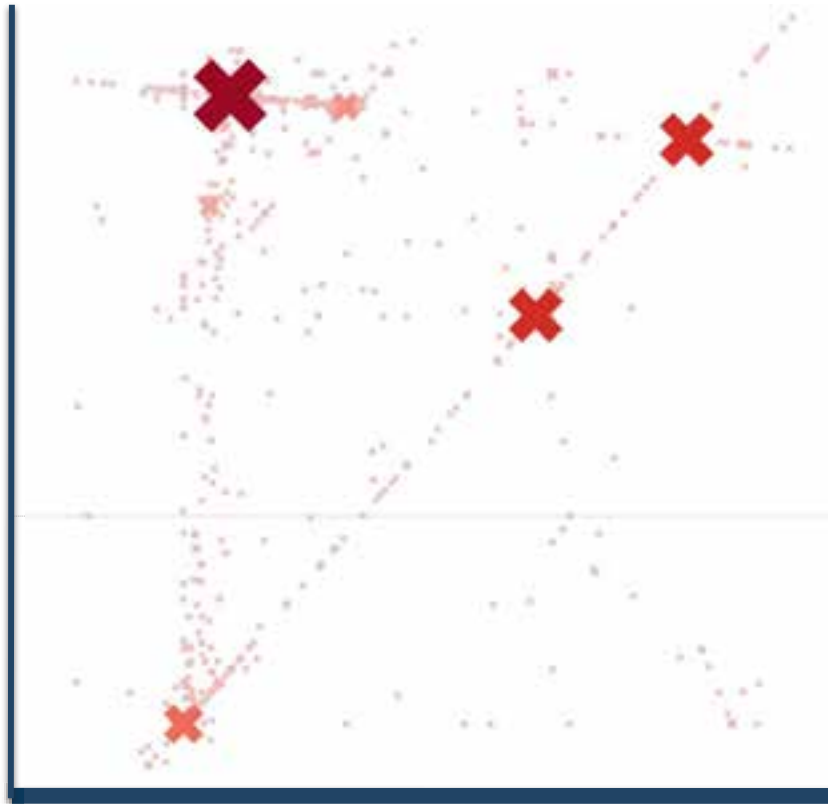


Over 690K course completions so far

Signature Track & Retention

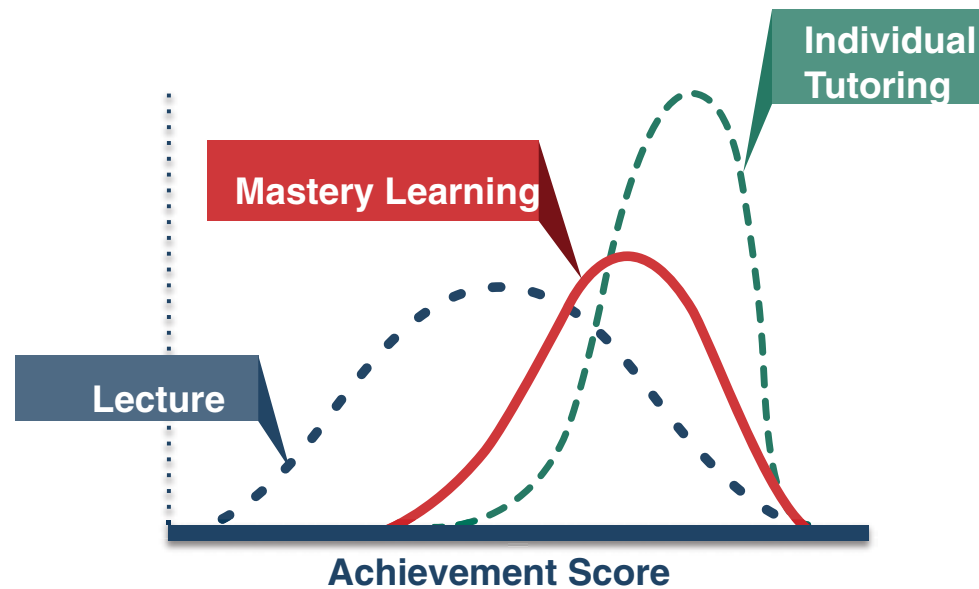
Improving Learning

Wrong student answers



New Window into Human Learning

"The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring." *B. Bloom, Educational Researcher (1984).*



The 2 Sigma Problem

“

College is a place where a professor's lecture notes go straight to the students' lecture notes, without passing through the brains of either.

”

—Edwin Emery Slosson





- High-quality online content
- Produced locally or adopted from another institution



- High-touch interaction with local instructor
- Active learning, problem solving, personal attention to students

The Best of Both Worlds

Scott Rixner and Joe Warren, Rice:

“I will never, ever, ever, teach a class any other way as far as I can tell... This is so much better- I had so much more fun teaching and the students learned so much more, I will never get up here and lecture. I just don't see the point anymore. I can do better this way.”



Adrienne Williams, UCI:

“This was more fun to teach than a traditional course...students were awake, asking questions, and much more engaged.”

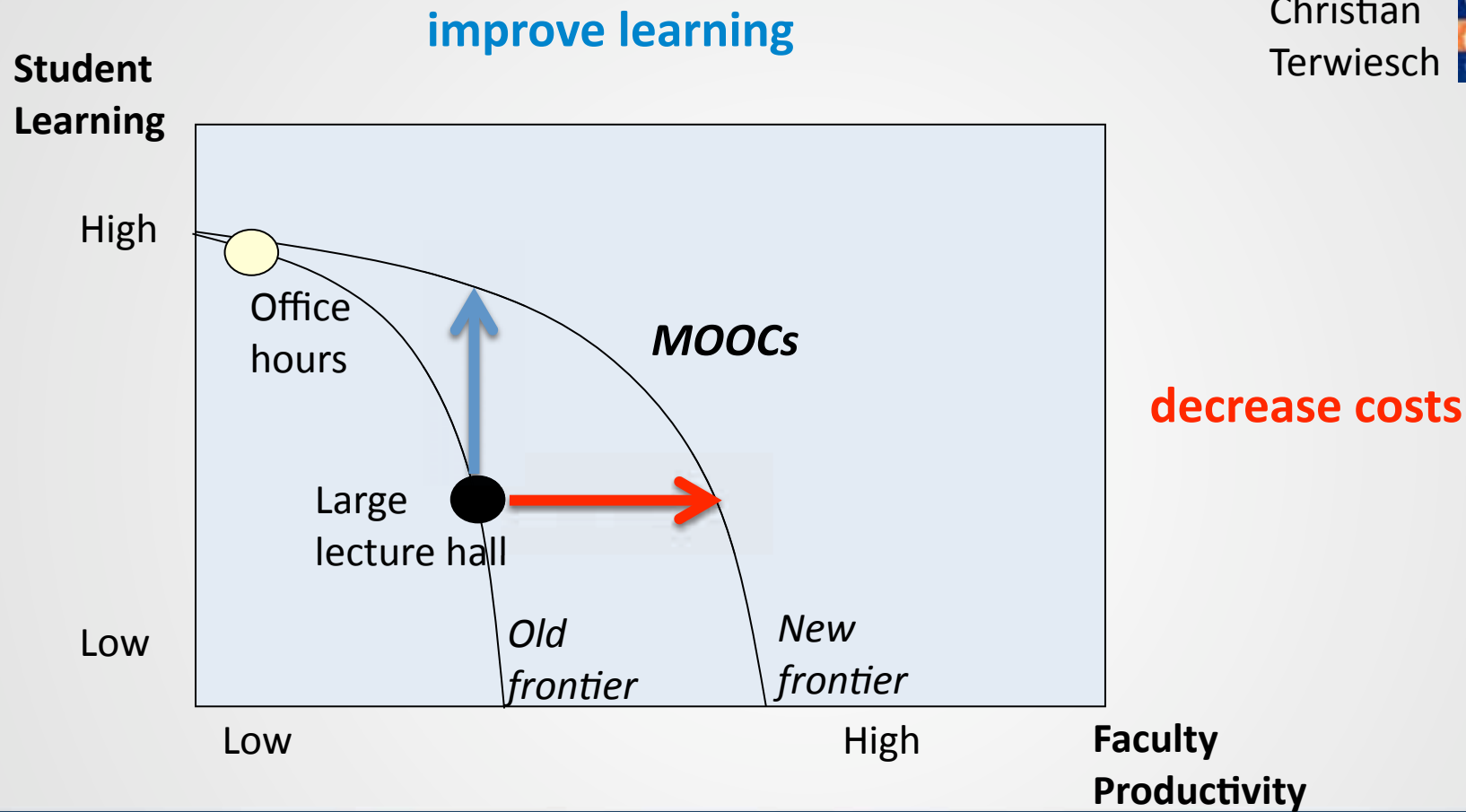


Kristin Sainani, Stanford:

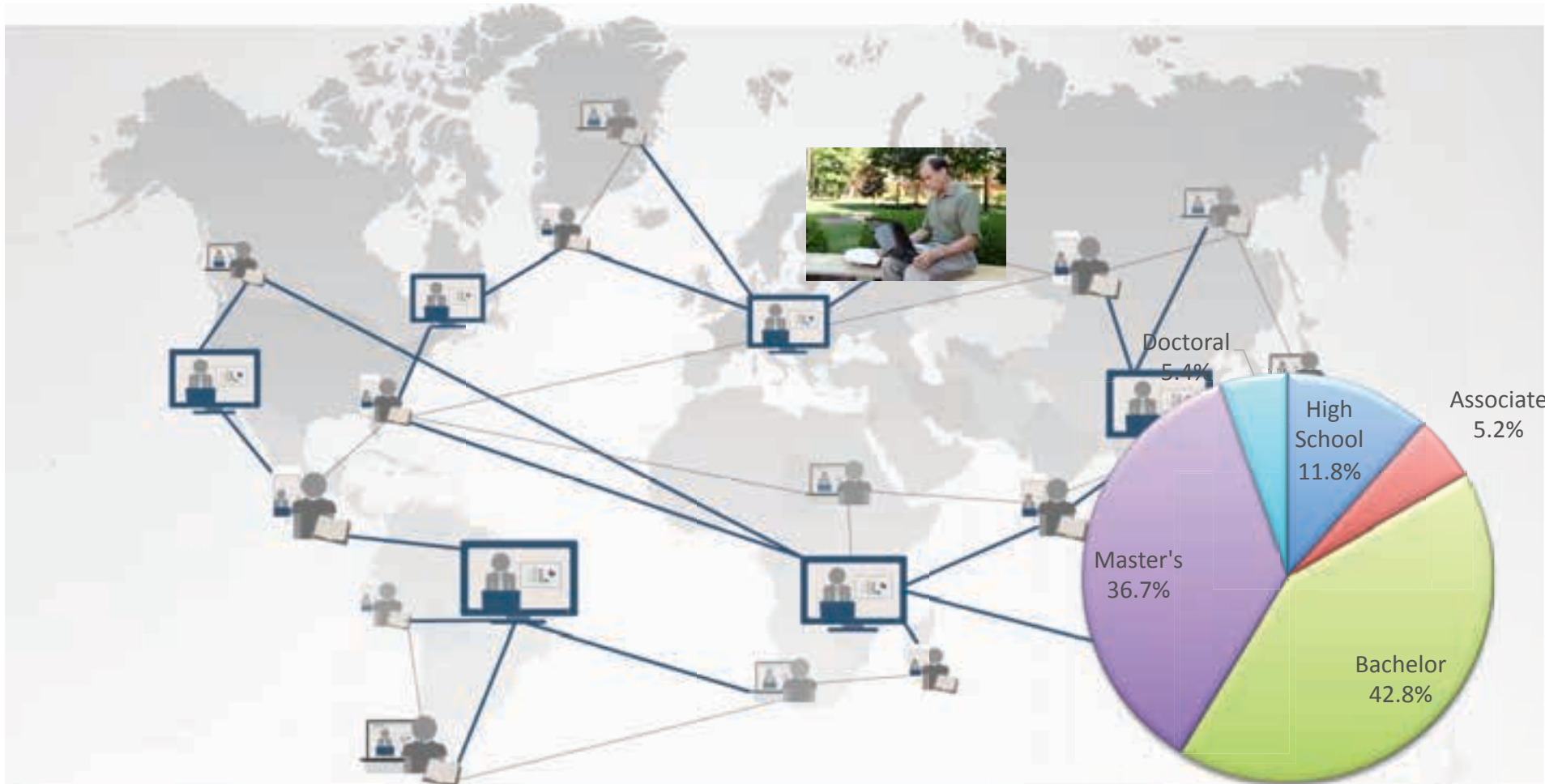
“As the instructor, I definitely preferred engaging in interactive discussions and exercises with the students rather than lecturing at them...my lectures used to take up nearly all the class time and I'd be rushing just to get through them.”



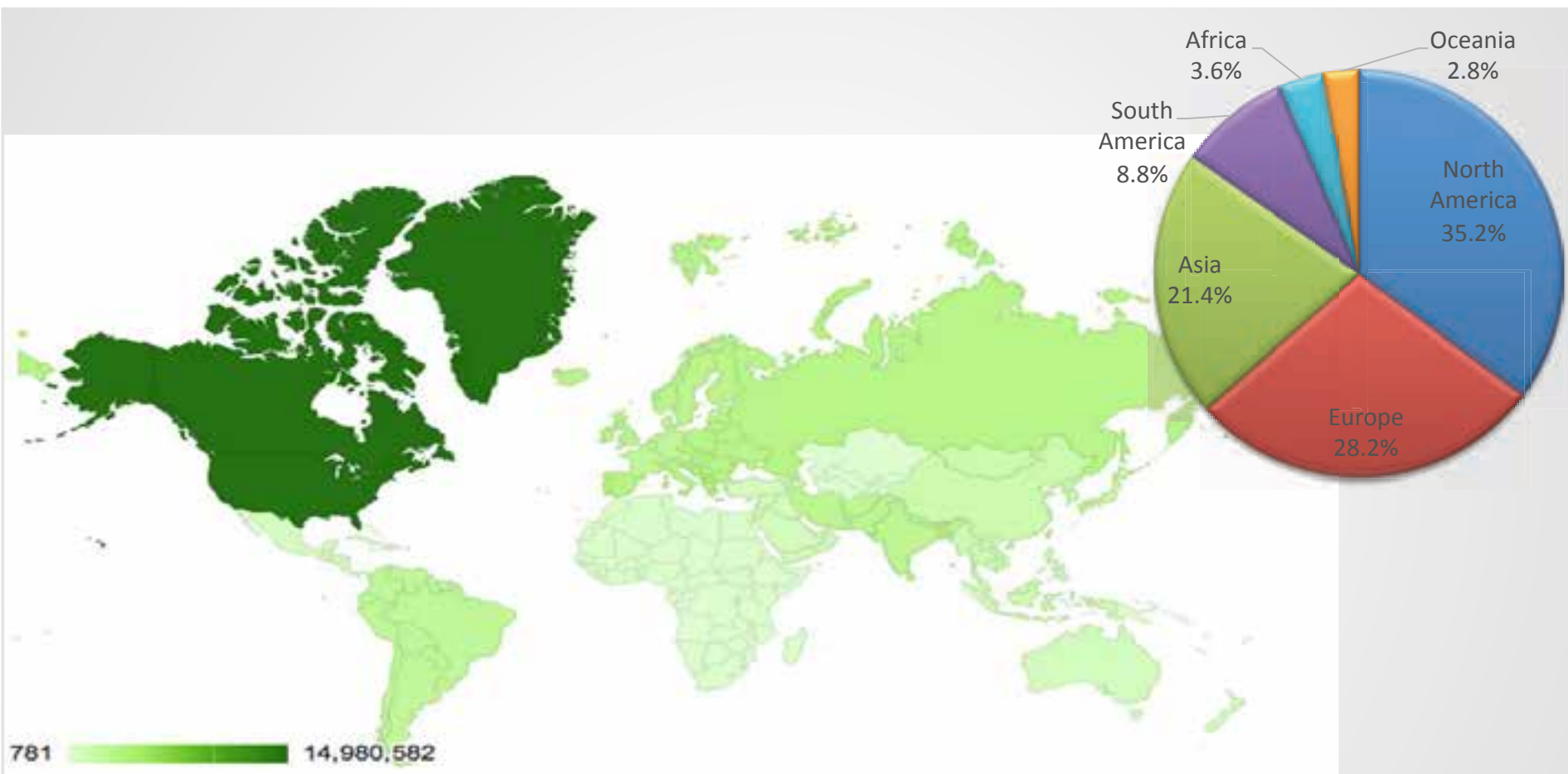
Flipped Classroom Teaching



A New Frontier for Education



Lifelong Learning



Education for Everyone