



31 July 2014

**Nonstandard Deviation: Making the Global
Local**

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PH207X Health in Numbers : Quantitative Methods in Clinical Public Health Research

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and

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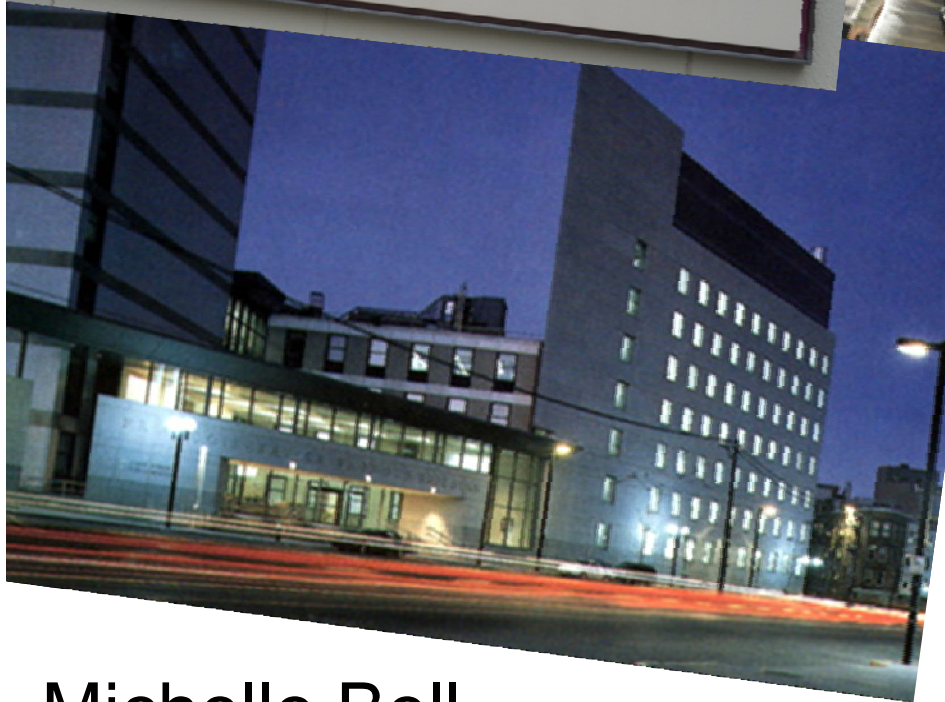
Elizabeth Mostofsky

Brian Sharkey

Pamela Rist

Harvard University School of Public Health

HARVARD UNIVERSITY
SCHOOL OF PUBLIC HEALTH



John Hess
Clayton Hainsworth
Alex Sachs
Piotr Mitros
Alex Krykليا
Valera Rozuvan
Ian Drummond
Andy Kim

Michelle Bell
Chris Riley
Cameos
Study Critiquers
Denis Agniel
Karen Han



Anna Eliot Ticknor
1823 – 1896

Society to Encourage Studies at Home



Professori senza frontiere

Le più prestigiose università statunitensi hanno deciso di offrire gratuitamente su internet i loro corsi. Una rivoluzione che potrebbe segnare la fine della vecchia accademia

OPINION | October 2, 2012, 7:01 p.m. ET

What Campuses Can Learn From Online Teaching

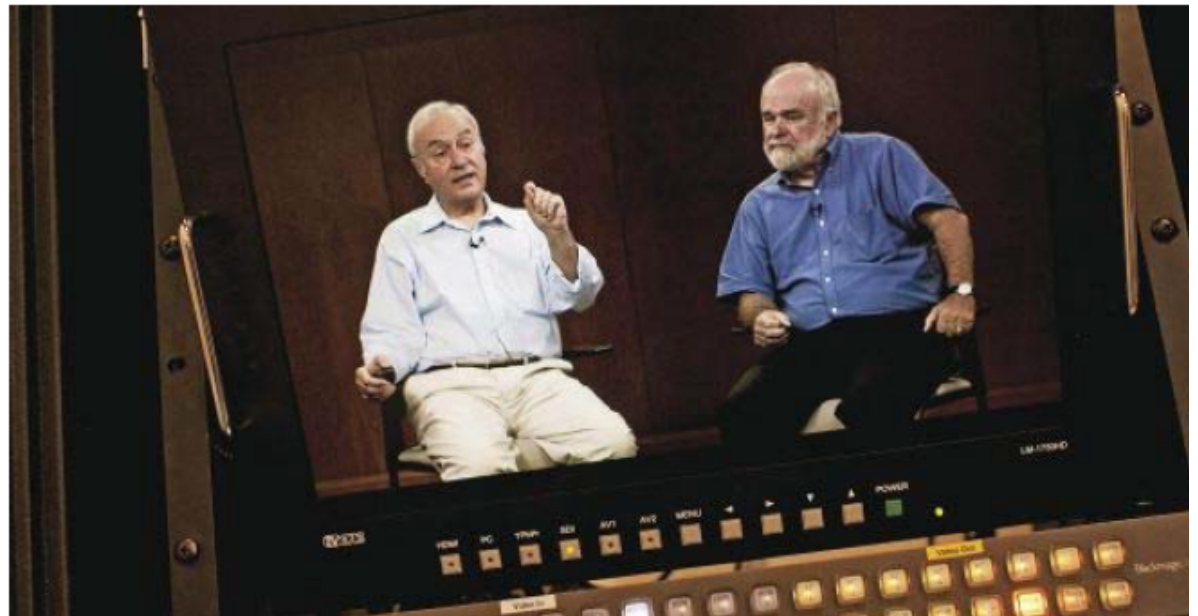
October 1, 2012

5 Ways That edX Could Change Education

By Marc Parry

Cambridge, Mass.

Harvard Online: A Worldwide Hit
By Kathleen Struck, Senior Editor, MedPage Today
Published: March 18, 2013



Kelvin Ma for the Chronicle



Campus 2.0

Massive open online courses are transforming higher education – and providing fodder for scientific research.

160 | NATURE | VOL 495 | 14 MARCH 2013

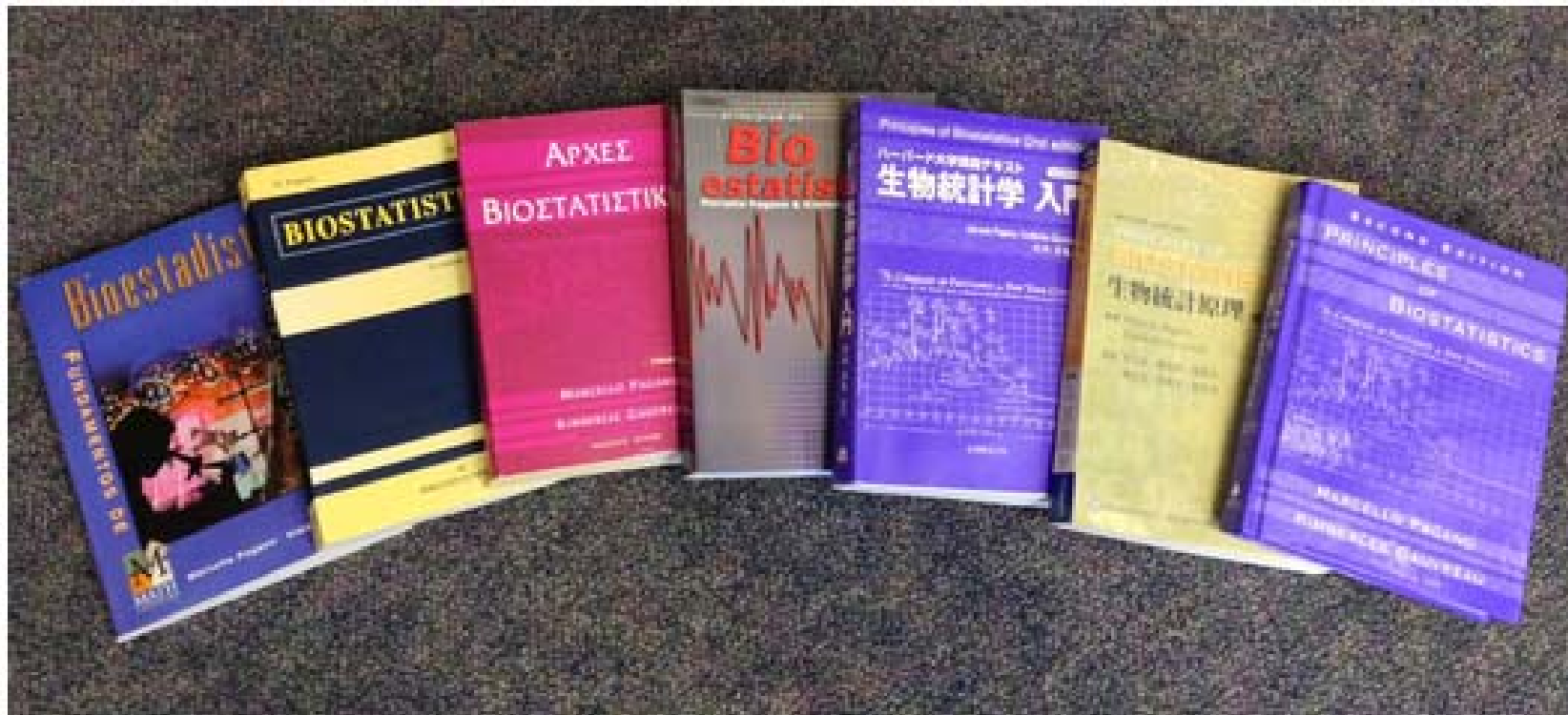
6



PH207X Health in Numbers

Pagano M. Gauvreau K. *Principles of Biostatistics –
Second Edition. Duxbury Press 2000*

Αρχές Βιοστατιστικής



PH207X Health in Numbers



Pagano M. Gauvreau K. Principles of Biostatistics –
Second Edition. Duxbury Press 2000

Αρχές Βιοστατιστικής

Data Presentation

Numerical Summary Measures

Rates and Standardization

Life Tables

Probability

Theoretical Probability Distributions

Sampling Distribution of the Mean

Confidence Intervals

Hypothesis Testing

Comparison of Two Means

Analysis of Variance

Nonparametric Methods

Inference on Proportions

Contingency Tables

Correlation

Linear Regression

Logistic Regression

Sampling Theory

PH207X Health in Numbers



Epidemiology component

Prevalence

Incidence

Measures of Association

Case Reports

Experimental Studies

Causal Inference

Cohort Study Design

Confounding

Case Control Studies

Stratification

Mantel-Haenszel

Estimation

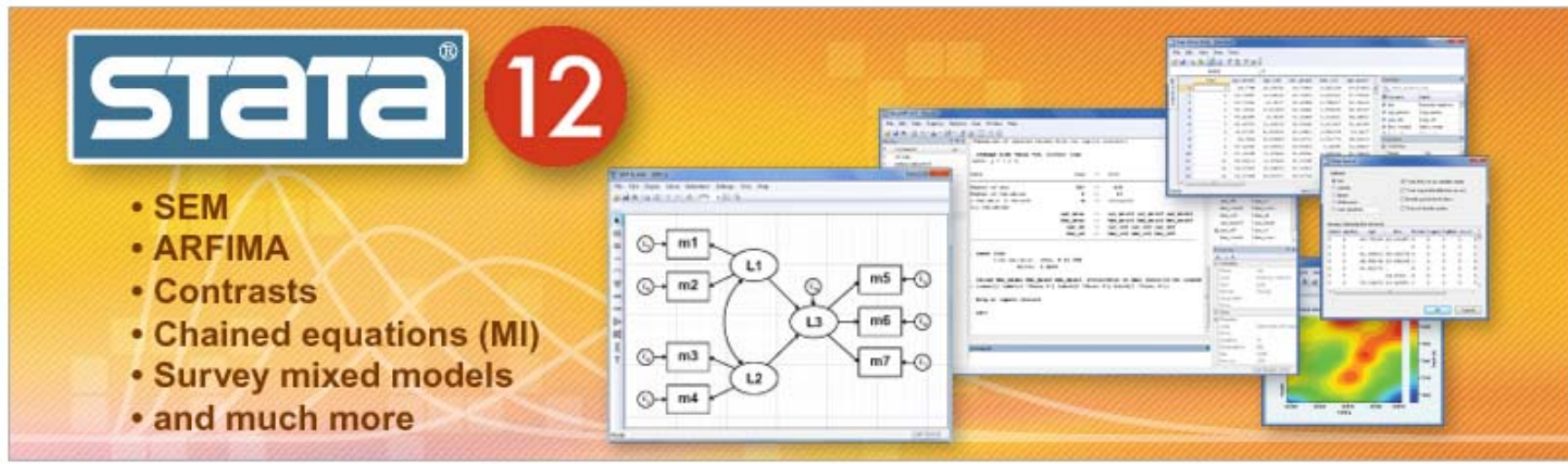
Matching

Regression Coefficients

Propensity Scores

Screening

Software



STATA 12

- SEM
- ARFIMA
- Contrasts
- Chained equations (MI)
- Survey mixed models
- and much more

The banner features several overlapping windows from the STATA 12 software interface. One window displays a path diagram with latent variables L1, L2, and L3, and manifest variables m1 through m7. Other windows show data tables, a regression output window with coefficients, and a heatmap visualization.

FiveThirtyEight

Nate Silver's Political Calculus

January 8, 2013, 11:58 pm | 10 Comments

Transcript of Nate Silver's 'Ask Me Anything' on Reddit

By THE NEW YORK TIMES



Barack Obama

Mitt Romney

313.0

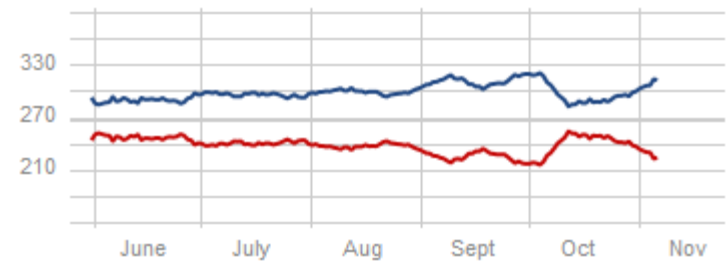
+14.0 since Oct. 30

Electoral
vote

225.0

-14.0 since Oct. 30

270 to win



Q.

What software do you use to analyze your data?

— *tab1901*

A.

I use Stata for anything hardcore and Excel for the rest.



FRAMINGHAM HEART STUDY

A Project of the National Heart, Lung and Blood Institute and Boston University

About FHS

Participants

FHS Investigators

Risk Score Profiles

FHS Bibliography

For Researchers



Three generations of participants.

The dedication of our thousands of participants has made, and continues to make, our rigorous epidemiologic research possible.



William B. Kannel, MD

Pioneer in Cardiovascular Epidemiology, 1923-2011

William B. Kannel, MD, died Aug. 20, 2011. He is survived by his wife, four children, 12 grandchildren and 23 great-grandchildren.

Dr. Kannel was born in 1923 in New York, where he attended high school, and then graduated from the Medical College of Georgia in Augusta in 1949. He was trained in internal medicine in the US Public Health Service at Staten Island, New York, and was a fellow of the American Heart Association, the American College of Cardiology, the American Epidemiology Society



William B. Kannel, MD, Director of the Framingham Heart Study, 1966-1979

Testing Treatments in a Tube: Induced Pluripotent Stem Cell Research (iPSC) is a recently developed method of changing ordinary white blood cells from individual blood samples so that they behave in the laboratory like cells from other organs. The first step reduces the specific functionality of the white cells, resulting in cells called iPSC's. The second step transforms the iPSC to imitate the function of another specific cell type such as liver, kidney or nerve cells. Since the iPSC testing is conducted in a laboratory after blood samples are drawn, the donor is not personally exposed to any tests or treatments.



Contains data from C:\Users\Marcello\Documents\edX\fhs.dta

obs: 4,434

vars: 74

size: 922,272

9 Aug 2012 09:42

variable name	storage type	display format	value label	variable label
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death	byte	%12.0g		Death indicator
angina	byte	%12.0g		Incident Angina Pectoris
hospmi	byte	%12.0g		Incident Hospitalized MI
mi_fchd	byte	%12.0g		Incident Hosp MI-Fatal CHD
anychd	byte	%12.0g		Incident Hosp MI, AP, CI, Fatal CHD
stroke	byte	%12.0g		Incident Stroke Fatal/non-fatal
cvd	byte	%12.0g		Incident Hosp MI or Stroke, Fatal or Non
hyperten	byte	%12.0g		Incident Hypertension
timeap	double	%12.0g		Days Baseline-Inc Angina
timemi	double	%12.0g		Days Baseline-Inc Hosp MI
timemifc	double	%12.0g		Days Baseline-Inc MI-Fatal CHD
timechd	double	%12.0g		Days Baseline-Inc Any CHD
timestrk	double	%12.0g		Days Baseline-Inc Stroke
timecvd	int	%12.0g		Days Baseline-Inc CVD
timedth	double	%12.0g		Days Baseline-Death
timehyp	double	%12.0g		Days Baseline-Inc Hypertension
sex1	byte	%12.0g		
totchol1	int	%12.0g		
age1	byte	%12.0g		



sex1	byte	%12.0g
totchol1	int	%12.0g
age1	byte	%12.0g
sysbp1	double	%12.0g
diabp1	double	%12.0g
cursmoke1	byte	%12.0g
cigpday1	byte	%12.0g
bmi1	double	%12.0g
diabetes1	byte	%12.0g
bpmeds1	byte	%12.0g
heartrtel	int	%12.0g
glucose1	int	%12.0g
prevchd1	byte	%12.0g
prevap1	byte	%12.0g
prevmil	byte	%12.0g
prevstrk1	byte	%12.0g
prevhyp1	byte	%12.0g
hdlc1	byte	%12.0g
ldlc1	byte	%12.0g
sex2	byte	%12.0g



Courseware Course Info Textbook Software Data Sets Discussion Wiki Progress FAQ Instructor

Welcome and Administrivia


edx introduction

Introduction to PH207x
Video Sequence

- Week 1
- Week 2
- Week 3
- Week 4
- Week 5
- Week 6
- Week 7
- Week 8

edX TOP LEVEL NAVIGATION

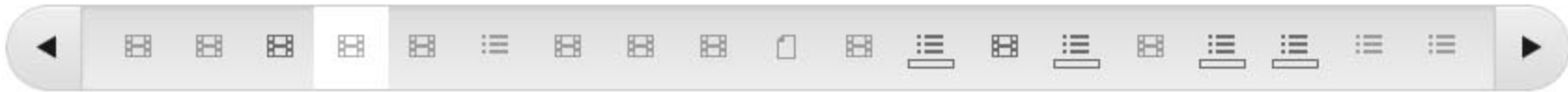
edX-FA12-cware-3_100



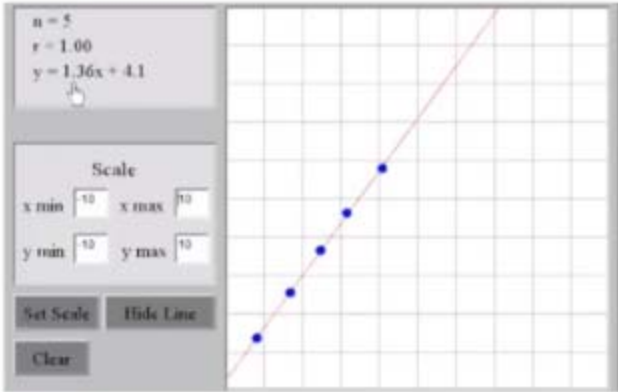
1:10 / 1:11 SPEED 1.0x HD CC

You should also be able to change your personal information from this dashboard. The next several videos will go into more depth on Discussion Forum usage, Wiki usage, and any course-specific **features that you may need.**

Course



LEAST SQUARES DEMO



The interface shows a graph with five blue data points and a red line of best fit. The control panel on the left displays the following statistics:

- $n = 5$
- $r = 1.00$
- $y = 1.36x + 4.1$

The Scale section includes input fields for x min, x max, y min, and y max, all set to 10. Buttons for 'Set Scale', 'Hide Line', and 'Clear' are also present.

Instructions:
To add a data point click in the white area.
Hold down shift and click on a point to drag that point to a new location.
In order to remove a point hold down control and click on the point.
Be sure that the circle around the point is showing before you click or drag a point that is already on the graph. The origin is at the center of the grid, but will move if you change the scale.

<http://illuminations.nctm.org/LessonDetail.aspx?id=L455>

edX

There's another point.
And then you can say, show the line.
So this line is the least squares line through those five points.
And we see that it's almost a perfect fit.
R is equal to 1 with an intercept of 4.1 and a slope of 1.36.
Now the question to ask is, what happens if a pointer or two gets shifted around.
Well if we go here and we shift this point around, move to there, look at that.

0:53 / 3:45 SPEED 1.50x HD CC

Download video [here](#)



Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

OR=2.11

What is your sex?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
Female	2,378 60.91 55.87	1,526 39.09 37.46	3,904 100.00 46.87
Male	1,878 42.43 44.13	2,548 57.57 62.54	4,426 100.00 53.13
Total	4,256 51.09 100.00	4,074 48.91 100.00	8,330 100.00 100.00

Pearson chi2(1) = 283.5208 Pr = 0.000



Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

$$OR=0.67$$

$$1/OR = 1.48$$

Do you consider your hair to be long?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
No	2,649 47.79 62.02	2,894 52.21 70.78	5,543 100.00 66.30
Yes	1,622 57.58 37.98	1,195 42.42 29.22	2,817 100.00 33.70
Total	4,271 51.09 100.00	4,089 48.91 100.00	8,360 100.00 100.00

Pearson chi2(1) = 71.6252 Pr = 0.000

-> Doyouconsideryourhairtobe = Yes



Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

OR=2.4

What is your sex?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
Female	1,418 61.41 87.86	891 38.59 75.13	2,309 100.00 82.46
Male	196 39.92 12.14	295 60.08 24.87	491 100.00 17.54
Total	1,614 57.64 100.00	1,186 42.36 100.00	2,800 100.00 100.00

Pearson chi2(1) = 76.6095 Pr = 0.000

-> Doyouconsideryourhairtobe = No

Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

OR=2.0

What is your sex?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
Female	958 60.14 36.32	635 39.86 22.03	1,593 100.00 28.85
Male	1,680 42.77 63.68	2,248 57.23 77.97	3,928 100.00 71.15
Total	2,638 47.78 100.00	2,883 52.22 100.00	5,521 100.00 100.00

Pearson chi2(1) = 137.0243 Pr = 0.000

-> Whatisyoursex = Female



Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

OR=0.95

Do you consider your hair to be long?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
No	958	635	1,593
	60.14	39.86	100.00
	40.32	41.61	40.83
Yes	1,418	891	2,309
	61.41	38.59	100.00
	59.68	58.39	59.17
Total	2,376	1,526	3,902
	60.89	39.11	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 0.6422 Pr = 0.423

-> Whatisyoursex = Male

Key
<i>frequency</i>
<i>row percentage</i>
<i>column percentage</i>

OR=1.1

Do you consider your hair to be long?	When you wash your hair in the shower, do you...		Total
	Face away	Face the	
No	1,680	2,248	3,928
	42.77	57.23	100.00
	89.55	88.40	88.89
Yes	196	295	491
	39.92	60.08	100.00
	10.45	11.60	11.11
Total	1,876	2,543	4,419
	42.45	57.55	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 1.4524 Pr = 0.228



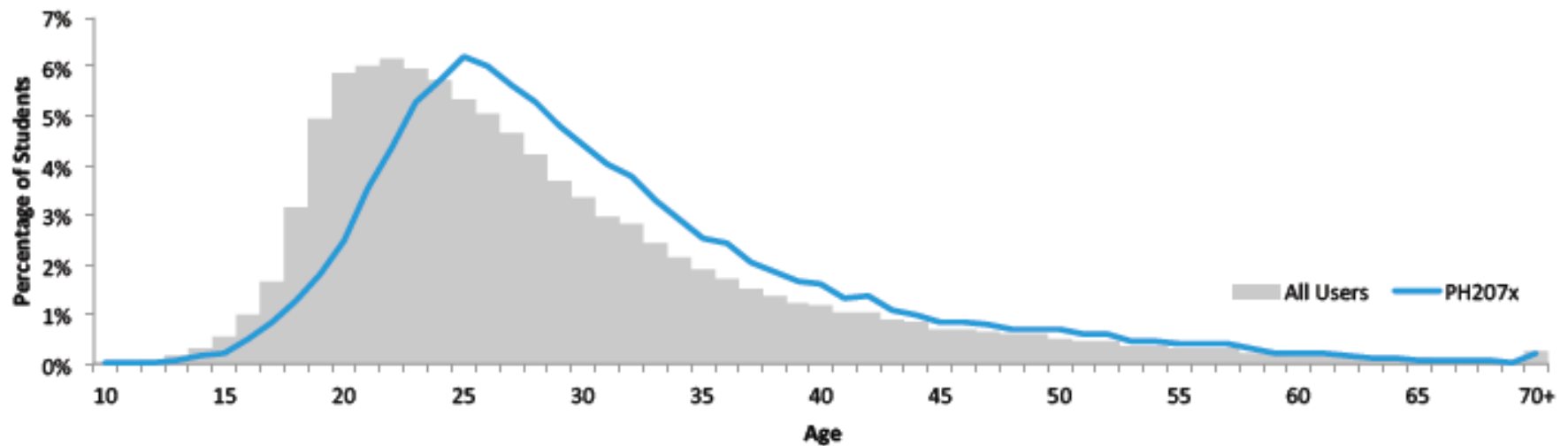
level_of_education	Freq.	Percent
	1,431	5.36
bachelors	8,784	32.91
Elementary	33	0.12
High school	2,722	10.20
Junior High School	237	0.89
Masters	9,737	36.48
None	86	0.32
Other	687	2.57
Doc in Sc Engin	1,173	4.39
Doc other	1,802	6.75
Total	26,692	100.00



gender	Freq.	Percent
	1,356	5.08
f	11,543	43.25
m	13,759	51.55
o	34	0.13
Total	26,692	100.00



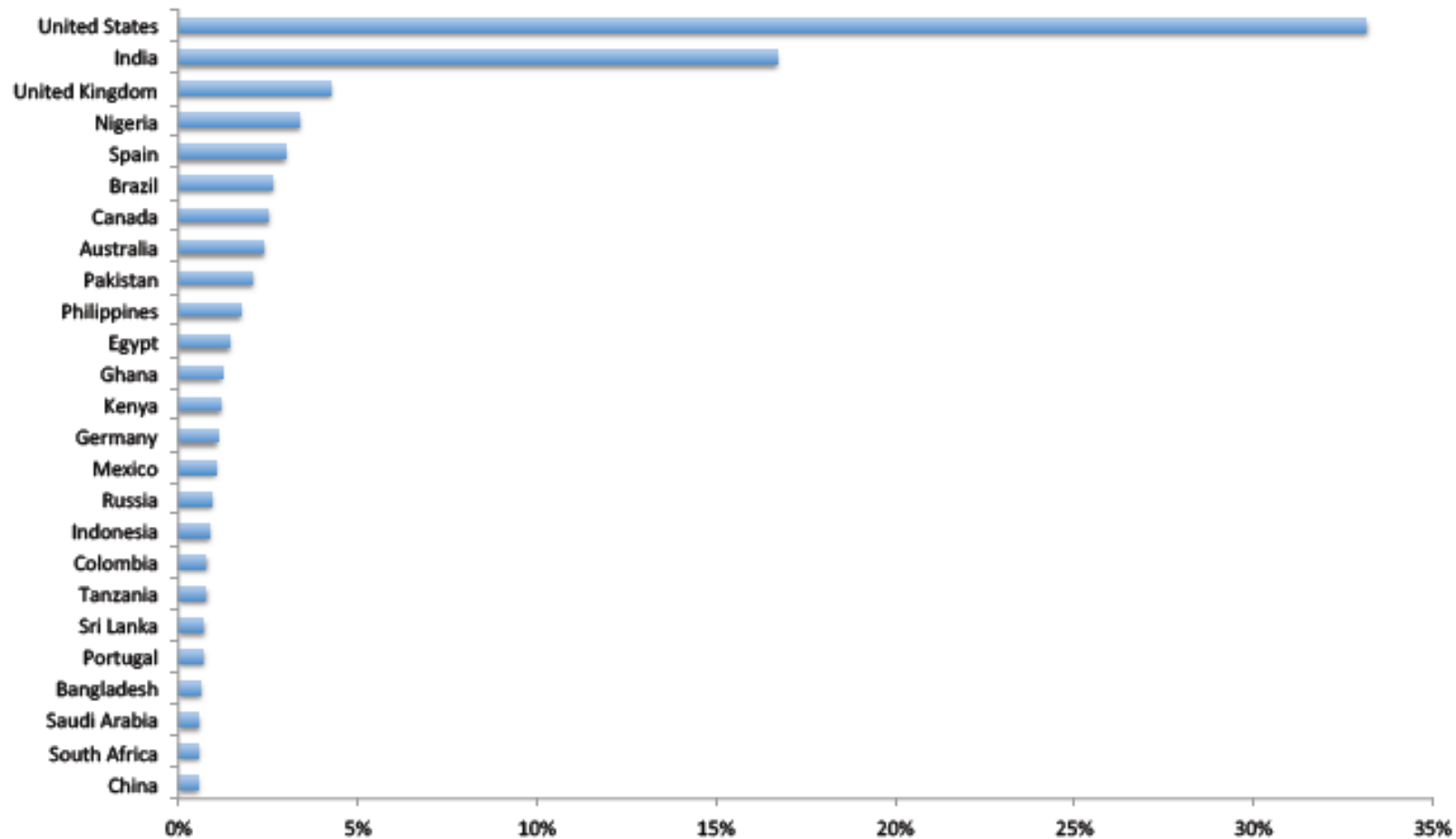
Ages of PH207x Students Compared to edX Totals



PH207x enrolled a substantially larger number of older students compared with other edX courses. Enrollments were more gender balanced than edX as a whole and generally better educated.

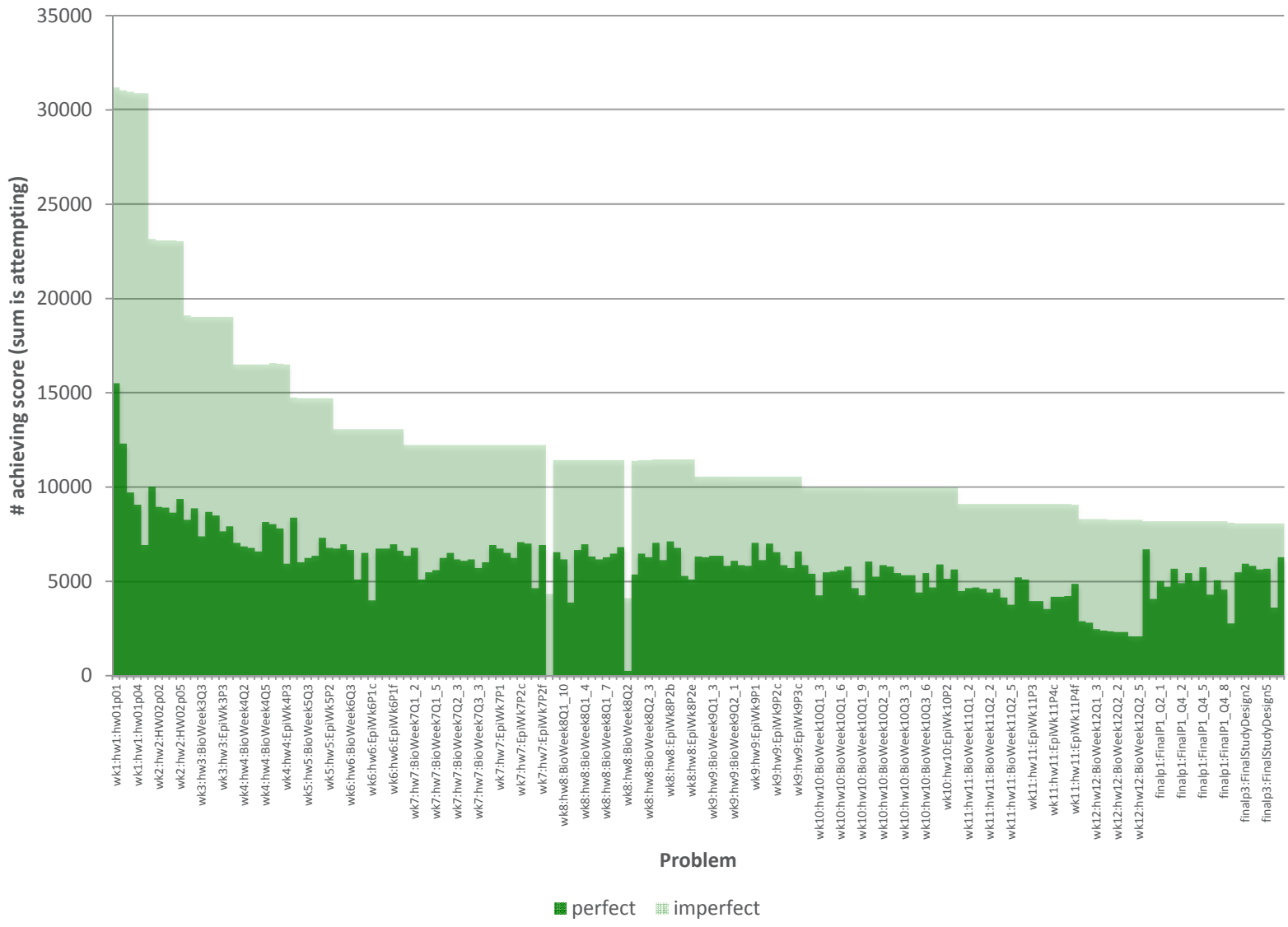
Geographic Distribution of PH207x Students, Fall 2012 (Top 25 Countries)

Note: This analysis is based on self-reported addresses. Only about 50% of PH207x students provided an address.



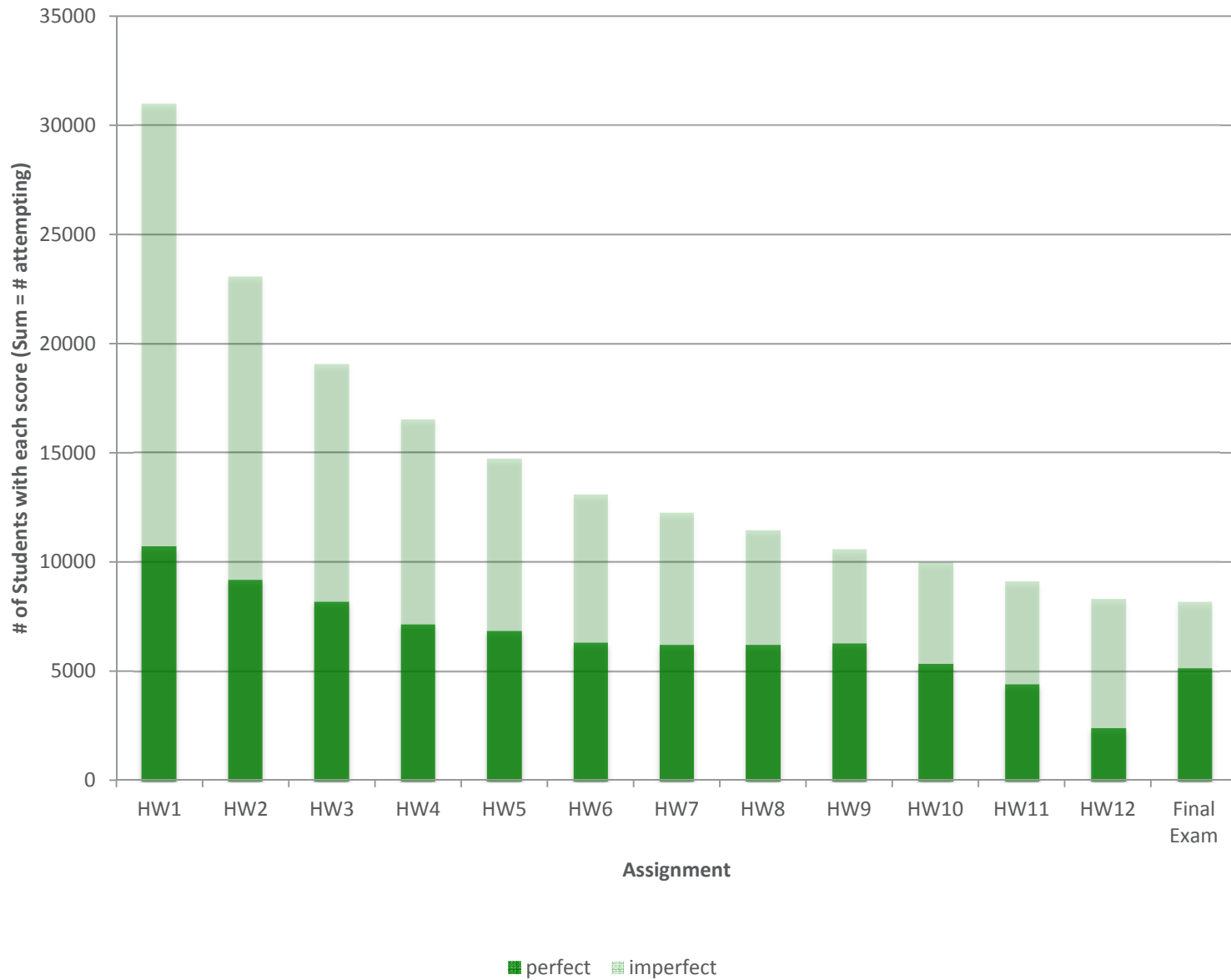
Top 25 Countries by enrollments in PH207x

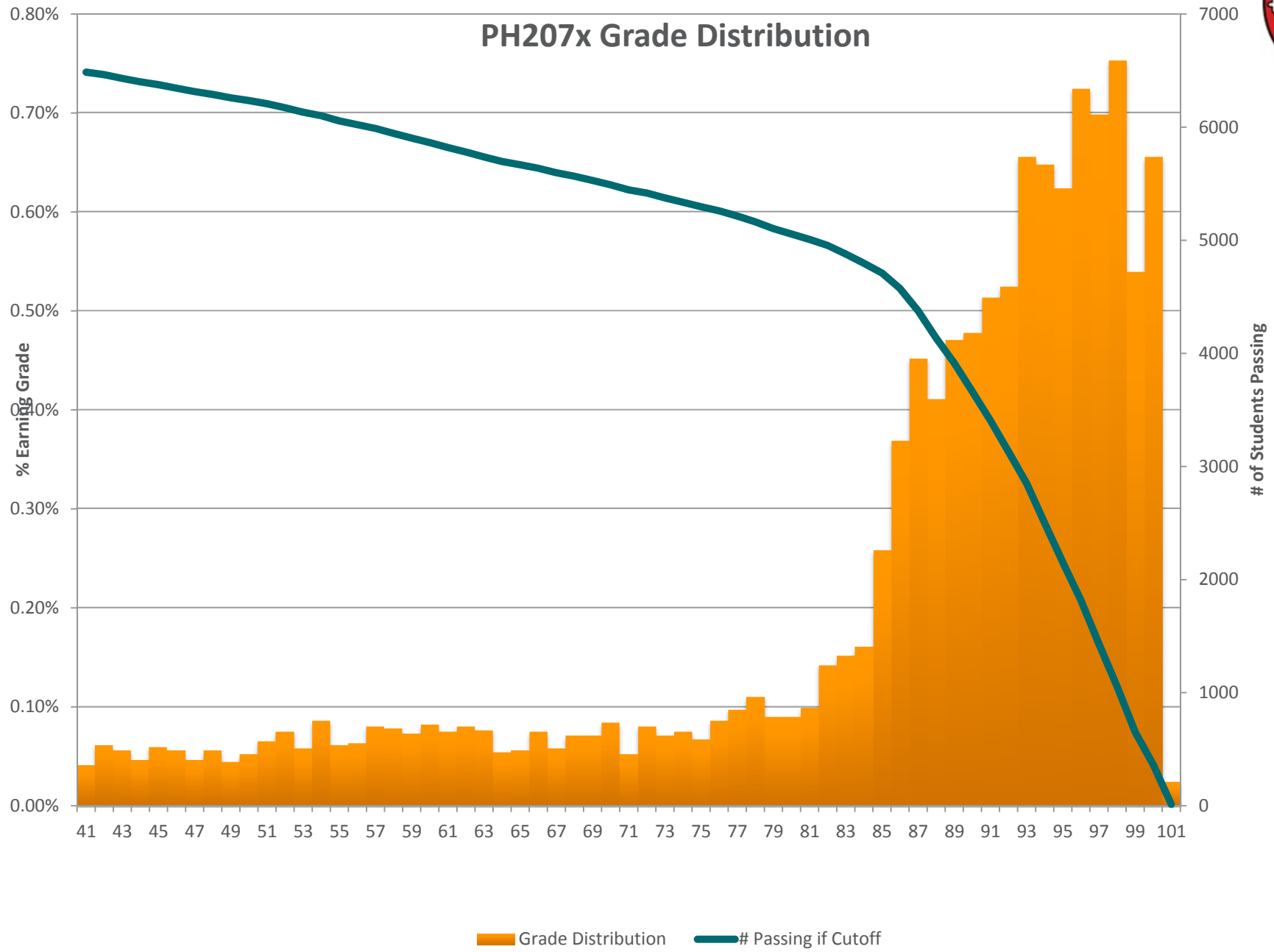
Ignoring the cohort which never attempted a single problem and those who registered after the first homework assignment was due (leaving 19,311 students in this analysis), 33% of students remained engaged enough to attempt the final exam and...





Perfect and Imperfect Responses (average over all questions in each assignment)







HARVARD
UNIVERSITY

CERTIFICATE
Issued Feb. 1st, 2013

This is to certify that

Hrafnhildur Halldórsdóttir

successfully completed

***PH207x: Health in Numbers: Quantitative Methods in
Clinical Public Health Research***

a course of study offered by **HarvardX**, an online learning
initiative of **Harvard University** through **edX**.

Marcello Pagano
Professor of Statistical Computing
Harvard School of Public Health

E. Francis Cook
Professor of Epidemiology
Harvard School of Public Health
Harvard Medical School

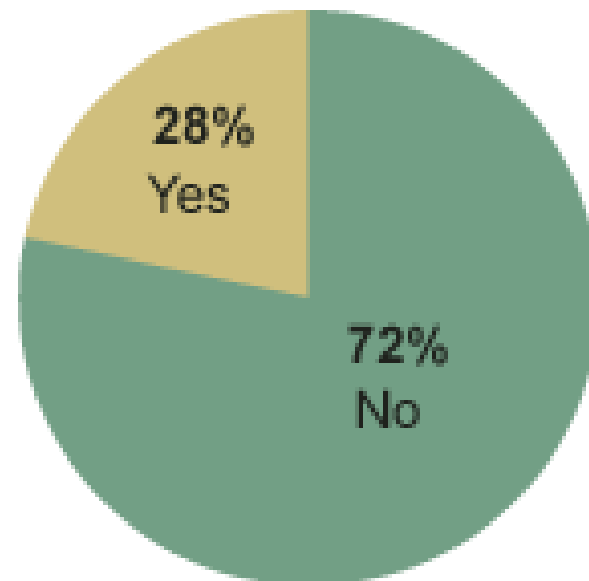
HONOR CODE CERTIFICATE

*Authenticity of this certificate can be verified at <https://verify.edx.org/cert/b7cfdc2704a430a962d60c3a7909723>



103/184

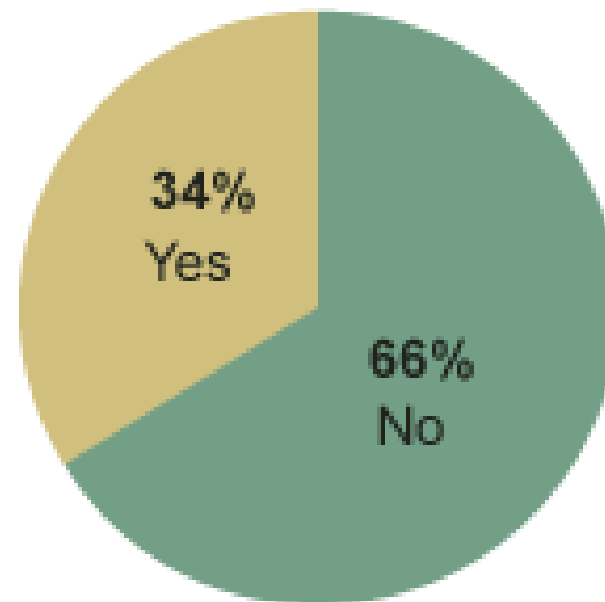
Do you believe students who succeed in your MOOC deserve formal credit from your home institution?





103/184

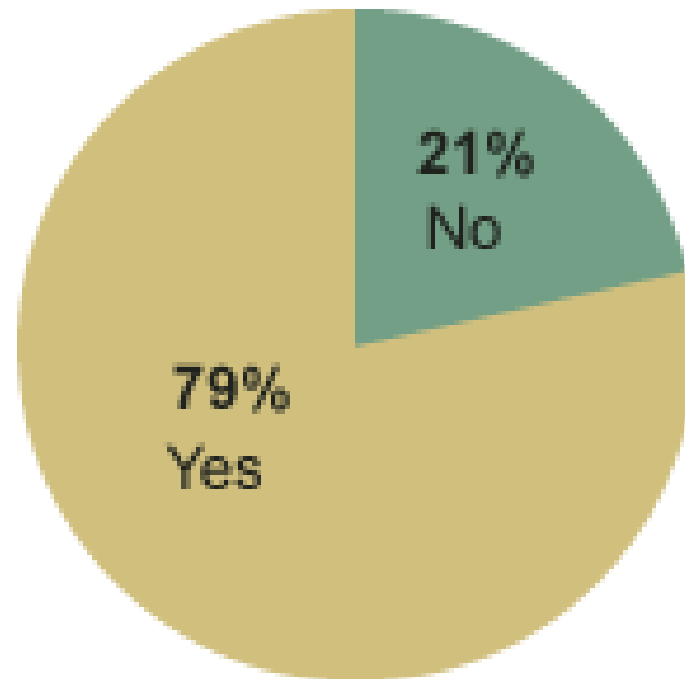
Do you believe your home institution will eventually grant formal credit to students who succeed in your MOOC?

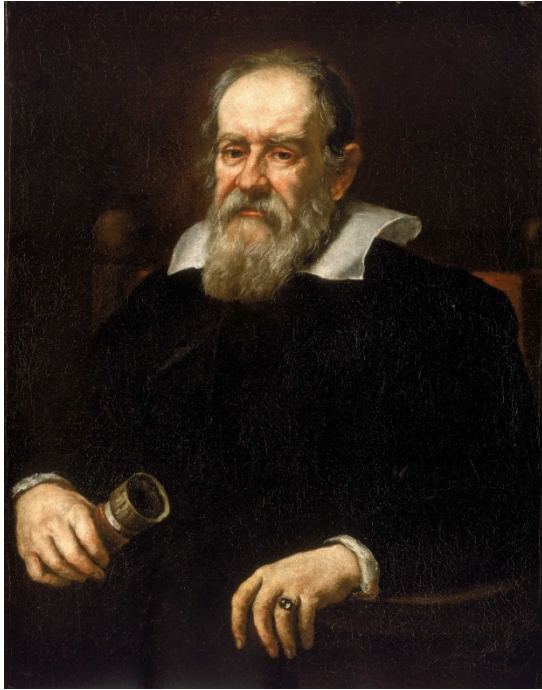




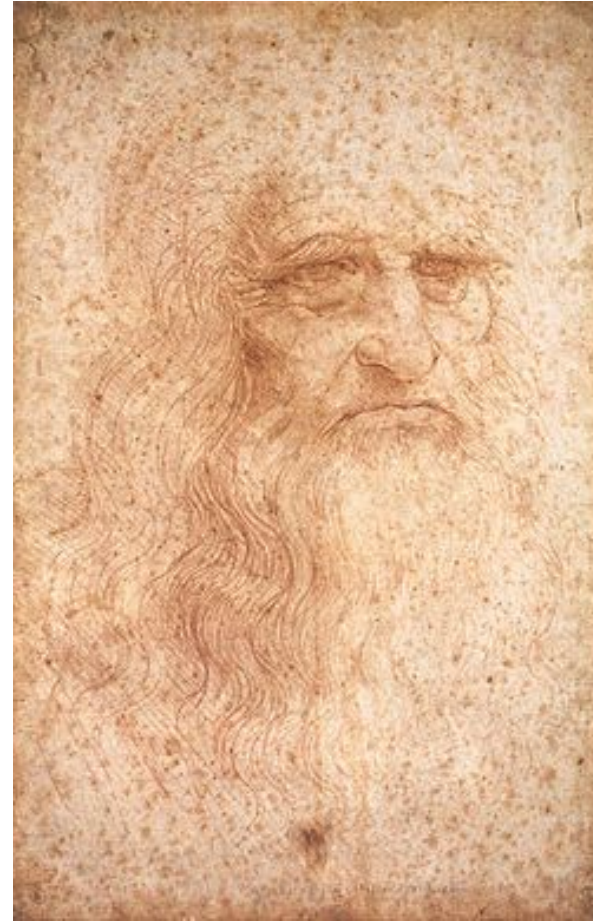
103/184

**Over all, do you believe
MOOCs are worth
the hype?**





Galileo Galilei
1564 – 1642



Leonardo da Vinci
1452 – 1519



Non puoi insegnare nulla ad un uomo,
puoi solo aiutarlo a scoprire ciò che ha dentro di sé.

12/28/2012

Print | E-Mail | Feedback



The Miracle of Wenchi

Ethiopian Kids Using Tablets to Teach Themselves

By *Fiona Ehlers*



Tim Freccia/ DER SPIEGEL

Matt
Keller

A US aid organization has handed children in the remote Ethiopian village of Wenchi tablet computers in an experiment aimed at enabling them to teach themselves. They are now speaking their first words of English -- without ever having encountered a teacher.



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Features

Can MOOCs Replace Traditional Textbooks?

MOOC content can be a valuable addition to course materials, but more experimentation is needed.

[More](#)

