

# CISE

DIRECTORATE FOR  
COMPUTER & INFORMATION  
SCIENCE & ENGINEERING



## CISE Broadening Participation and Education in Computing preK-20

Jan Cuny  
February 2018

# Diversity of CS & CSE PhD pipeline

78.4% Male	65.4% Nonresident Alien	} 97.4%
21.6% Female	32.0% White or Asian	

Women

African Americans

Hispanics

Native Americans

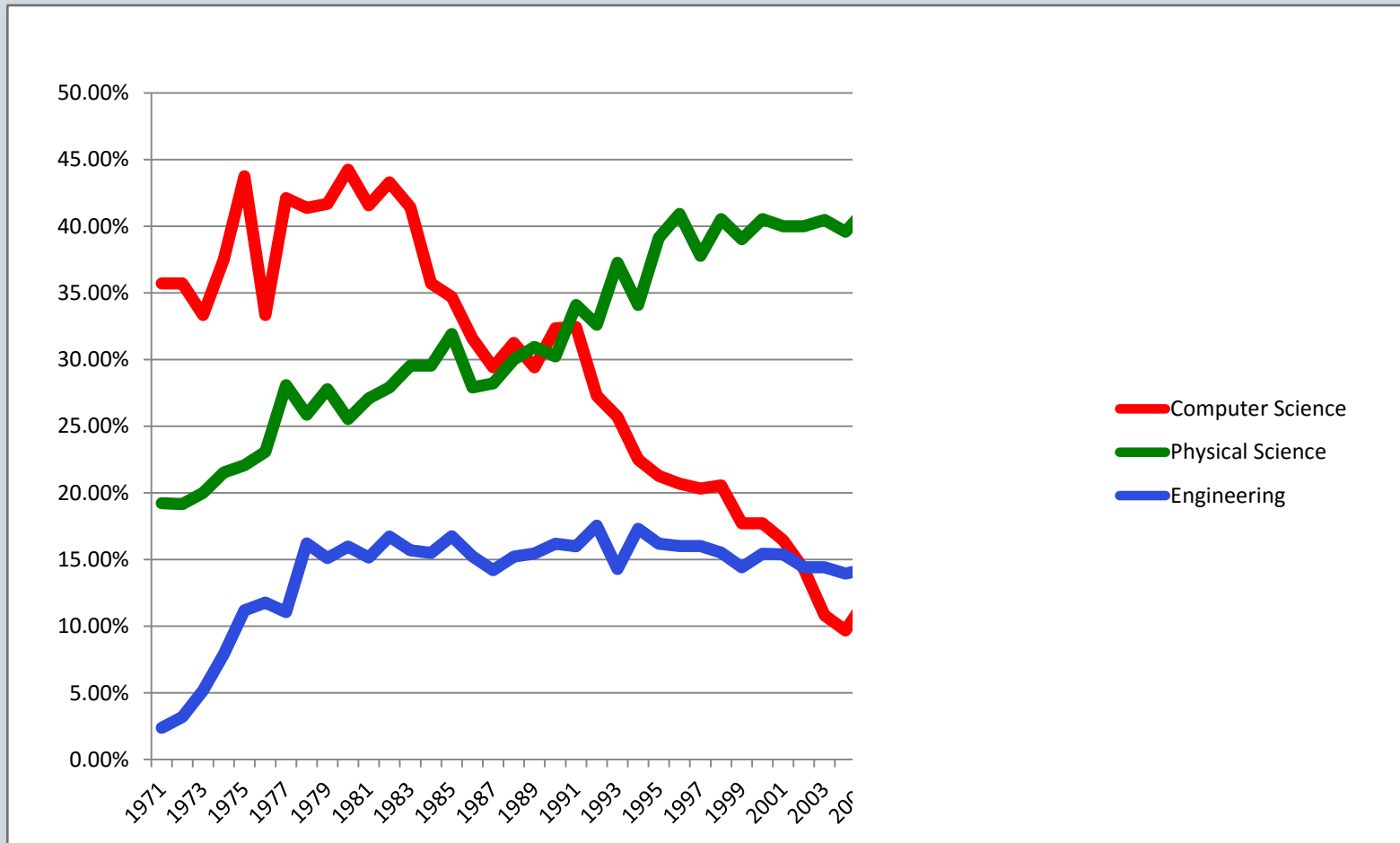
+

Persons with Disabilities

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**The Missing 70%**

# HERI: % Women of Intended Majors





Jane Margolis

# Exploring Computer Science (ECS)



The screenshot shows the homepage of the Exploring Computer Science website. At the top left is the ECS logo, followed by the text "Exploring Computer Science". To the right is a navigation menu with links for "About", "Curriculum", "Teacher Program", "Research", "News & Events", "Resources", and "Contact". A "Follow @ExploringC" button is in the top right corner. Below the navigation is a row of four image-based links: "Our Mission" (with a photo of a young girl), "Curriculum" (with a photo of a woman holding a book titled "EXPLORING"), "Teacher Program" (with a photo of a man pointing at a whiteboard), and "Results In Brief" (with a photo of a young man). Below this row is the heading "Exploring Computer Science" and the tagline "A K-12/University partnership committed to democratizing computer science." To the right of the tagline is a video player icon labeled "ECS Intro Video". Below the tagline are two green buttons: "ECS Curriculum" and "Teachers Participate in PD 2016-17". At the bottom right is a blue banner for "CHAMPIONS OF CHANGE" with the slogan "One Voice Can Change the World" and a photo of a building.

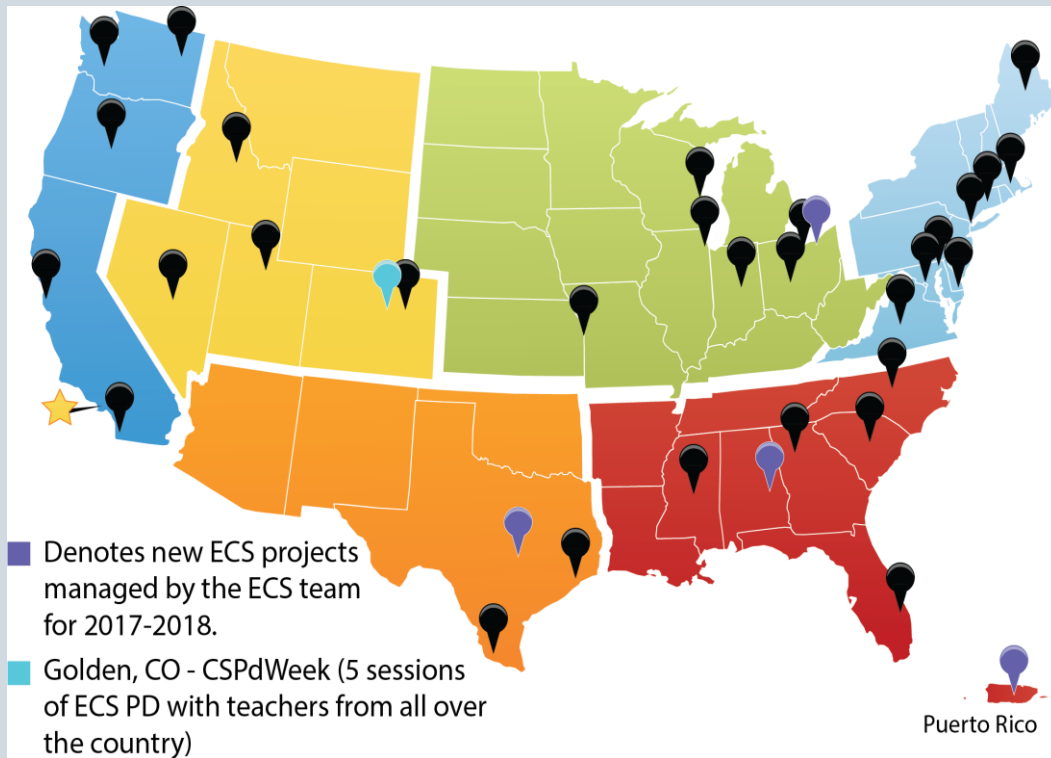
Tweets by @exploringcs

# CS 10K

10,000 Schools

10,000 Teachers

# High School: ECS



- 26 states have ECS programs
- ~ 50,000 students in 2016-17
- ~8,000 students in LA, 75% URMs
- CPS made CS course a graduation requirement







AP<sup>®</sup>

CS  
PRINCIPLES

HOME OFFER CS CSP COURSES RESOURCES PARTNERS ABOUT COLLEGE BOARD PEOPLE



### Computer Science Principles

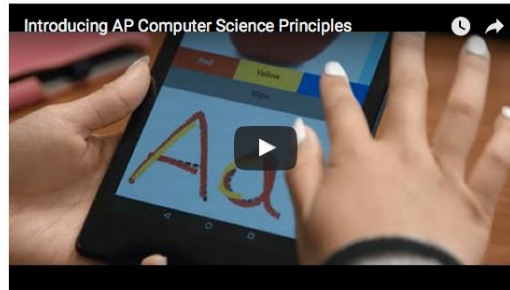
#### **President Obama announces** [Computer Science For All](#)

A new, widely accessible Advanced Placement Course for Computer Science. The College Board oversees the development of the course and exam that will launch as AP Computer Science Principles in 2016-2017. For College Board details, see [College Board's Advances in AP](#) site.

The [AP Computer Science Principles Curriculum Framework \(.pdf/1.42MB\)](#) was developed to serve as a foundational guide to ensure selected curricula focuses on innovative aspects of computing along with the computational thinking practices that are critical to a future-ready education.

[NSF Medium Article "Real Talk From Real Computer Science Teachers."](#)

[Sign up to register your interest in AP Computer Science Principles](#)



CONCEPTUALLY-BASED

ENGAGING

RIGOROUS

HANDS-ON

INSPIRING

**DESIGNED for EQUITY**

2006	Discussion with the College Board
2007	Stakeholder Meeting
2008-12	Design & piloting of Curricular framework —AP Commission & Advisory Board —First Pilots at the university level —K-12 PD & HS Pilots —Extensive piloting of the course and PD
5/2012	Attestation
2012-17	Design and piloting of the exam, PD
5/5/2017	First Official Exam
2018	Revision of framework and Exam, PD





THRIVING  
— IN OUR —  
DIGITAL WORLD

## THE BEAUTY AND JOY OF COMPUTING

BJC, created at the University of California, Berkeley, serves as an introduction to computer science for the non-computer-scientist. It includes an emphasis on the social implications of computing and emphasizes technology's connection to society.

”  
I fell in love with computing.

— BJC Student | Berkeley, CA

[bjc.berkeley.edu](http://bjc.berkeley.edu)

## MOBILE COMPUTER SCIENCE PRINCIPLES

Mobile CSP was developed at Trinity College in Connecticut to build socially useful mobile applications. It provides a programming-based introduction to computational thinking and emphasizes writing, communication, collaboration, and creativity.

”  
From the beginning, the kids thought it was really fun. My enrollment tripled from last year to this year.

— Mobile CSP Teacher | Milford, CT

[mobile-csp.org](http://mobile-csp.org)

## THRIVING IN OUR DIGITAL WORLD

TODW was designed at the University of Texas at Austin. It uses project-based learning to introduce students to the big ideas in computer science that exist across disciplinary boundaries, including digital manipulation, big data, and artificial intelligence.

”  
I've taken a coding course before, but I've never taken any sort of real computer science... I have a better understanding of what I'm actually doing and the concepts behind this.

— TODW Student | Austin, TX

[cs.utexas.edu/~engage](http://cs.utexas.edu/~engage)



Community Resources Journals Blog Events HelpSquad



Community Profile



Community Profile:  
Bobak Shafiei

Get to know one another in our community profile series! This month, meet Bobak Shafiei who works in the DC public school system.

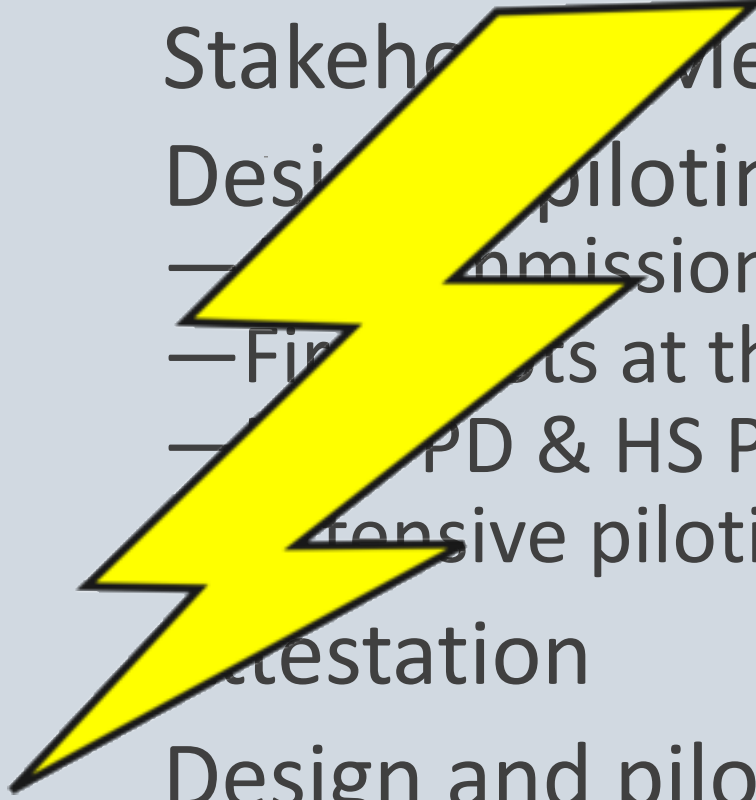
[BOBAK SHAFIEI »](#)

WELCOME TO CS FOR ALL TEACHERS





**1,600+**



2006	Discussion with the College Board
2007	Stakeholder Meeting
2008-12	Design and piloting of Curricular framework <ul style="list-style-type: none"><li>— Submission &amp; Advisory Board</li><li>— First Pilots at the university level</li><li>— PD &amp; HS Pilots</li><li>— Comprehensive piloting of the course and PD</li></ul>
5/2012	Assessment
2012-17	Design and piloting of the exam, PD
5/5/2017	First Official Exam
2018	Revision of framework and Exam, PD

Code.org

ACM

NCWIT

TFA

PLTW

NMSI

Infosys Foundation USA / DonorsChoose  
ED, DOD, White House

Education **DIVE** TOPICS FEATURES

**D** TOP EDUCATION NEWS ONE DAILY NEWS

**NEWS**

King sails through nomination hearing for education secretary

Utah's sex ed classes will remain abstinence-based

Philadelphia offers felons a college education instead of prison time

**State goals aim to foster support for computer science**

By Erin McEntyre | February 24, 2016

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HOT TOPICS: Oscars tonight Razzies' worst film Draymond vs. Kerr? Olofin Palme mystery South C

Every afternoon. FREE

**Computer science launched in Oakland**

er came to Skyline High School in Oakland

K-12 POST SECONDARY BUSINESS OPPOR

Chicago SIGN UP FOR NEWSLETTERS

**CBS Chicago**

WBBM NEWSRADIO 700 WBBM

Home News Sports Health Audio Video Best Of Events Traffic Weather Contests Directory Travel Des

Local Investigative Politics Business health Consumer Entertainment National World Photos

**BE SMART >**

**Should Computer Science Education Cover More Than Theory**

You need theory as well as practice, some say

by BlackEnterprise.com Posted: February 23, 2016

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across the country, promising to teach students to code

But computers are not just about coding. There's also a focus on theoretical concepts from the basic education in colleges and universities.

...yay items becoming connected to the Internet in what is com

... "Internet of things," and the continued demand for mobile computing. In 2015, an estimated 1,000,000 of these jobs will be left unfilled.

**Computer Science Now Required For Chicago High Schoolers**

February 26, 2016 4:30 PM

Filed Under: Chicago Public Schools, Computer Science, CPS, Mayor Emanuel, Required



Mr. Morpheus walking through the streets of Chicago, clearly excited to teach kids how to code! (Warner Bros. and Village Roadshow Film)

by **Mason Johnson**

The Chicago Public School Board of Education has made computer science a graduation requirement for [high school](#) students.

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Washington Gov. Jay Inslee is leading a national effort to teach tech skills to the next generation of students.

But making computer science an integral part of basic education starts with having the right teachers. Governor Inslee promised to make that one of his top priorities in the

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**Gov. Inslee**

education effort

of Computers

**HAIDE CONSTRUCTION**

Remodeling & Roofing Experts

I trust Haide with my home. You can trust Haide too!

-Michael Y

Most Popular

Seattle homeless encampment defies amid ongoing controversy

Where were you during the Nisqually earthquake?

Felix Hernandez's first bullpen goes w Mariners spring training



**2,500+**  
**SCHOOLS**



**50,000**  
**STUDENTS**

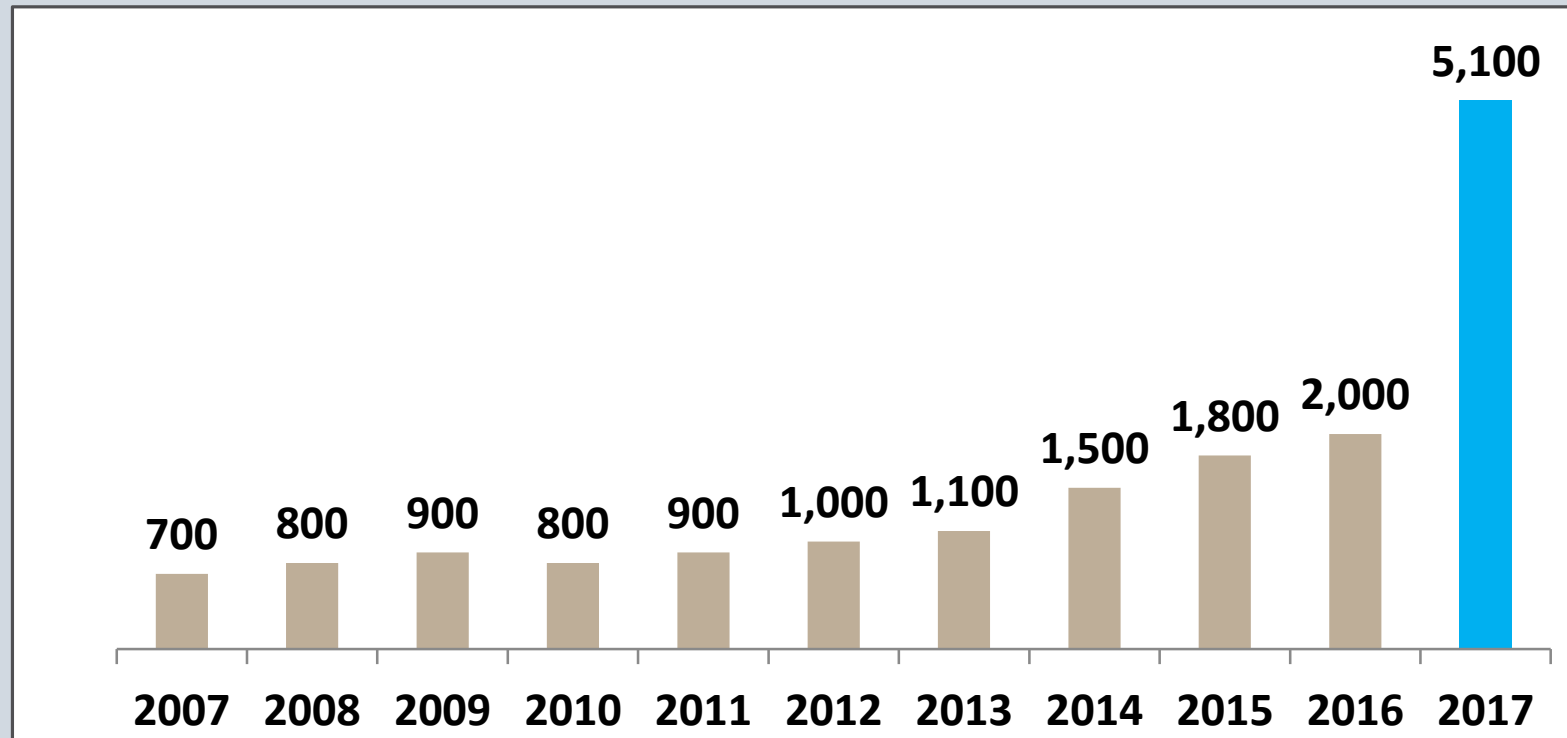


**49**  
**STATES**

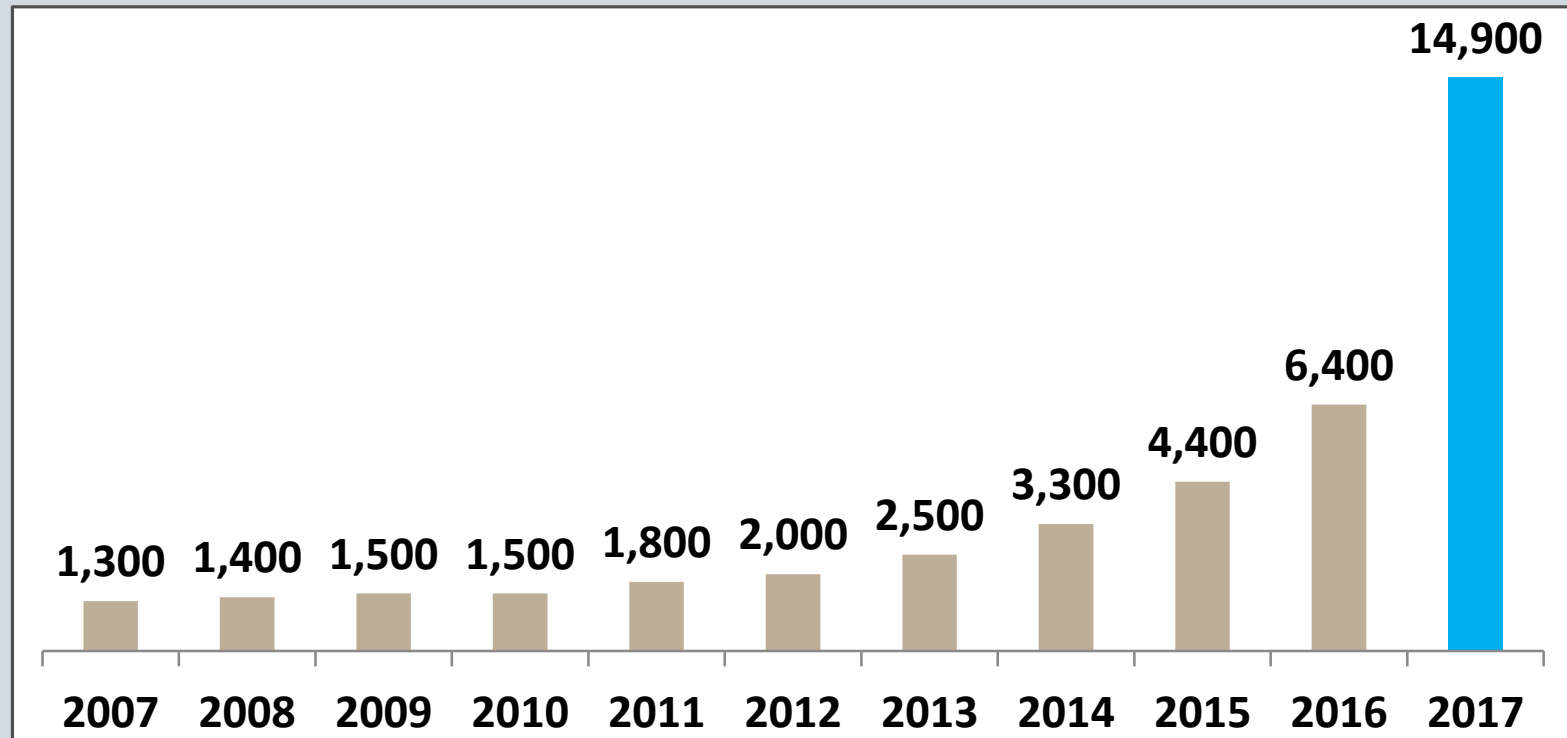


**2,700**  
**TEACHERS**  
**TRAINED**

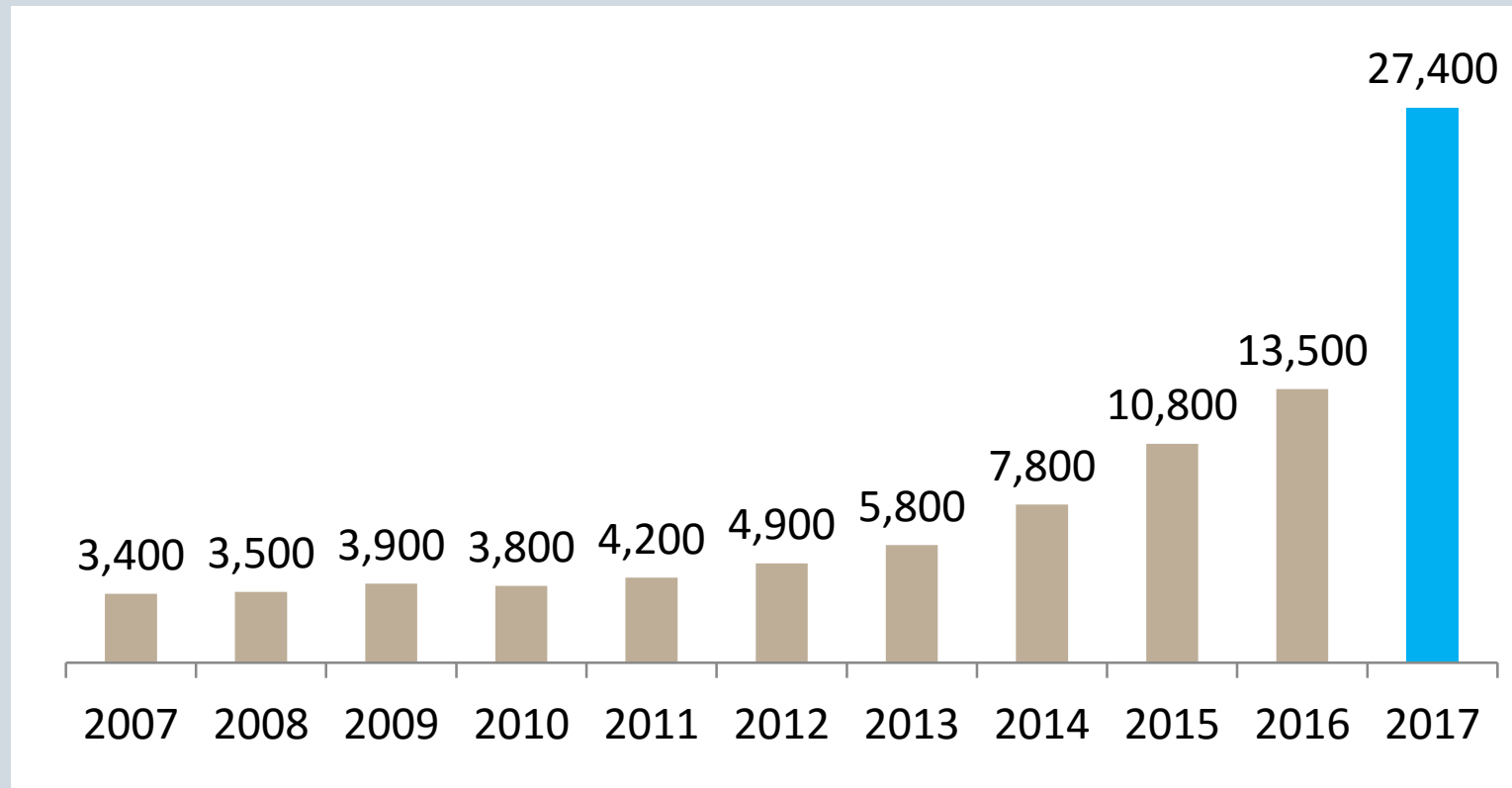
# Number of Black or African American students taking an AP CS exam has more than doubled with the addition of CSP



# Number of Hispanic or Latino students taking an AP CS exam has more than doubled with the addition of CSP

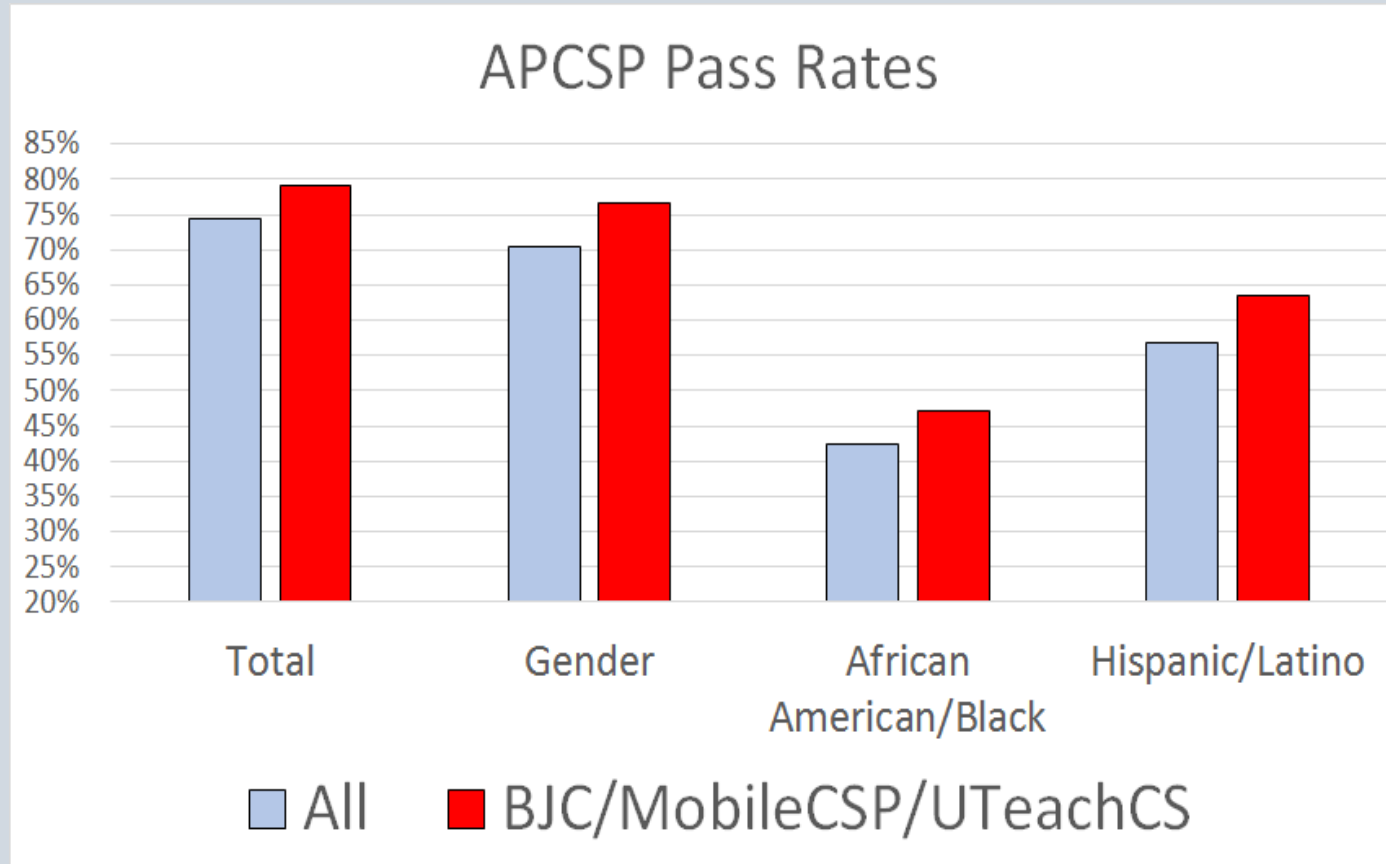


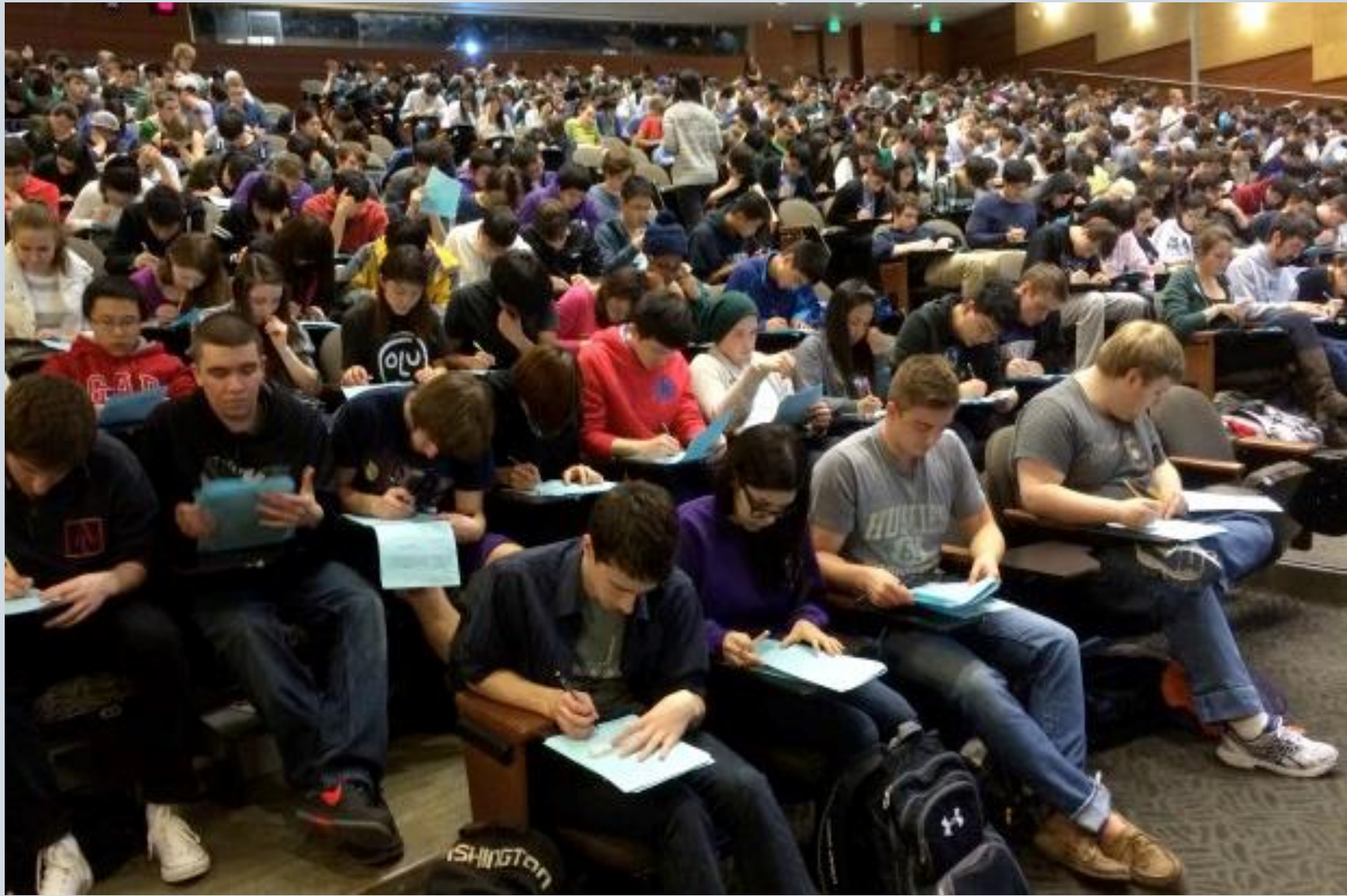
# Number of female students taking an AP CS exam has more than doubled with the addition of CSP





# High School: CSP







JCuny@nsf.gov