Incubating

*Computer Science and IT!*

October 6, 2016

Sr. Manager, Computer Science and IT Education

Computer Science 4 All

cs4all.io  @cs4allcps
CS4All in Chicago

The Vision

The Implementation

The Culture
Women in Computer Science

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Population</td>
<td>50.8%</td>
</tr>
<tr>
<td>Share of CS/Math Jobs</td>
<td>25.6%</td>
</tr>
<tr>
<td>Share of CS Degrees</td>
<td>15%</td>
</tr>
</tbody>
</table>

Problems with Participation in Computing

Women in Computer Science

- Share of Population: 50.8%
- Share of CS/Math Jobs: 25.6%
- Share of CS Degrees: 15%

Latinos and African-Americans in CS

- Share of Population: 16.3%
- Share of CS/Math Jobs: 12.6%
- Share of CS Degrees: 8.3%

- Share of Population: 6.6%
- Share of CS/Math Jobs: 8.3%
- Share of CS Degrees: 4%

Problems with Supply and Demand

9 in 10 parents want their child to study computer science.
1 in 4 schools teach computer programming.

The majority of schools don't teach computer science.

71% of all new jobs in STEM are in computing.
8% of STEM graduates are in Computer Science.

The “STEM” problem is in computer science.

Source: Code.org

1M well-paying Jobs!
Vision:

Provide a relevant and compelling Computer Science and Information Technology experiences for every Chicago student.

And we decided that we were going to do this...

No Matter What!
2012:
ECS Professional Development (PD)
2013:
Mayor Rahm Emanuel and our CEO announce K-12 CS in Chicago (CS4All)
Ariel Elementary, September, 2014
Winter, 2015:
What does “All” look like
Teacher PD, Curriculum, Advocacy
First major district to have CS as a graduation requirement, Winter, 2016
Current Implementation

- Early College STEM Schools
- CTE IT Schools
- All other school!

Participating vs. Non-Participating CS Schools

<table>
<thead>
<tr>
<th></th>
<th>Participating</th>
<th>Non-Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>District, Contract, Other ES</td>
<td>91</td>
<td>69</td>
</tr>
<tr>
<td>District and Contract ES</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>District, Contract, Other HS</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>District and Contract HS</td>
<td>63</td>
<td>37</td>
</tr>
</tbody>
</table>
Research shows that our CS educational efforts are working

50% increase in the number of high school students taking computer science.

25% increase in the number of schools offering computer science.
Research shows that our CS educational efforts are working.

More than 80% of CPS computer science students are Latino or African-American.
Research shows that our CS educational efforts are working.

More than 40% of CPS computer science students are Female.
Research shows that our CS educational efforts are working

More than 700 CPS teachers have participated in professional development for our K-12 CS initiative.

Over half are women and around half are Latino or African-American.
Research shows that our CS educational efforts are working.

- Quality of the ECS class
- Increased interest in taking another computer science course
  - 0.52
- Increased interest in majoring in computer science
  - 0.32

Exploring Computer Science (ECS) in CPS has led to increased interest in pursuing computer science.
Over 10,000 HS Students
Taking CS and IT this fall!
What’s this really all about?
Got started with “Coding”

Computer Science ≠ Digital Literacy

Just coding

Chicago Public Schools
bit.ly/cs4allchicago
Computer Science for All...

is an innovative computer science education program that provides equity, empowerment, and opportunities that maximize the innate potential of every student to transform and advance their community, nation, and world. The Computer Science for All initiative is providing all CPS students with high-quality CS instruction to spark their interest in education and teach valuable skills that open up opportunities for high-tech careers.
Computer Science ... is so much more!
Collaboration, planning, communication, design, perseverance...
5th Graders at Dore Elementary -- taking a vow of silence, learning about and demonstrating the underrepresentation of women in CS.
“What does a computer scientist look like?”
smart
creative
problem solver
perseverance
hard working
imaginative
cooperative
focused
serious
logically
determined
intelligent
skilled
friendly
What Does a Computer Scientist Look Like?

Draw a picture of a computer scientist. Give your computer scientist a name!
Taste of Computing Loaner Robots Program
A few of our Partners

- Illinois Technology Foundation
- Google
- Microsoft
- DePaul University
- Loyola University Chicago
- CME Group
- Black Tech Mecca
- Chicago Public Schools
- UIC
- Illinois State University
- Illinois Institute of Technology
- Robert Morris University
- Chicago Public Schools
- CSTA
- CS4All Chicago
Clarifying “All”
600K
TECH JOBS AVAILABLE IN THE U.S.
26K TECH JOBS AVAILABLE IN ILLINOIS
### Top 15 hiring regions

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>Job Postings</th>
<th>Job Posting per population</th>
<th>Growth in demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York-Northern New Jersey-Long Island, NY-NJ-PA (Metropolitan Statistical Area)</td>
<td>401,329</td>
<td>465.81</td>
<td>Higher demand than average</td>
</tr>
<tr>
<td>Washington-Arlington-Alexandria, DC-VA-MD-WV (Metropolitan Statistical Area)</td>
<td>261,563</td>
<td>888.29</td>
<td>Much higher demand than average</td>
</tr>
<tr>
<td>Los Angeles-Long Beach-Santa Ana, CA (Metropolitan Statistical Area)</td>
<td>195,990</td>
<td>353.71</td>
<td>Average demand</td>
</tr>
<tr>
<td>San Francisco-Oakland-Fremont, CA (Metropolitan Statistical Area)</td>
<td>193,604</td>
<td>916.34</td>
<td>Much higher demand than average</td>
</tr>
<tr>
<td>Chicago-Joliet-Naperville, IL-IN-WI (Metropolitan Statistical Area)</td>
<td>179,236</td>
<td>406.26</td>
<td>Higher demand than average</td>
</tr>
</tbody>
</table>

Source: Labor Insight Jobs (Burning Glass Technologies)
# BATEC National Center of Excellence

## Chicago (Overall IT Employment)

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</tr>
</thead>
<tbody>
<tr>
<td>All IT Occupations</td>
<td>121,360</td>
<td>19%</td>
<td>77,669</td>
<td>54%</td>
<td>$89,357</td>
<td>37 Days</td>
</tr>
<tr>
<td>Computer Programmer</td>
<td>16,550</td>
<td>13%</td>
<td>3,841</td>
<td>20%</td>
<td>$97,441</td>
<td>32 Days</td>
</tr>
<tr>
<td>Computer System Analyst</td>
<td>17,470</td>
<td>26%</td>
<td>10,727</td>
<td>43%</td>
<td>$89,539</td>
<td>35 Days</td>
</tr>
<tr>
<td>Data Engineer</td>
<td>18,030</td>
<td>12%</td>
<td>16,082</td>
<td>56%</td>
<td>$84,506</td>
<td>37 Days</td>
</tr>
<tr>
<td>Health IT Specialist</td>
<td>5,220</td>
<td>12%</td>
<td>3,186</td>
<td>88%</td>
<td>$47,335</td>
<td>35 Days</td>
</tr>
<tr>
<td>InfoSec Analyst</td>
<td>2,230</td>
<td>30%</td>
<td>2,442</td>
<td>214%</td>
<td>$95,311</td>
<td>38 Days</td>
</tr>
<tr>
<td>Net Support Specialist</td>
<td>3,620</td>
<td>20%</td>
<td>675</td>
<td>81%</td>
<td>$59,328</td>
<td>40 Days</td>
</tr>
<tr>
<td>Software Developer</td>
<td>35,780</td>
<td>25%</td>
<td>31,178</td>
<td>47%</td>
<td>$100,869</td>
<td>40 Days</td>
</tr>
<tr>
<td>User Support Specialist</td>
<td>18,840</td>
<td>19%</td>
<td>4,817</td>
<td>77%</td>
<td>$53,641</td>
<td>30 Days</td>
</tr>
<tr>
<td>Web Developer</td>
<td>3,620</td>
<td>20%</td>
<td>4,721</td>
<td>19%</td>
<td>$88,879</td>
<td>31 Days</td>
</tr>
</tbody>
</table>

1. Source: Burning Glass Technologies
2. Calculated using Bureau of Labor Statistics data
5. Source: Bureau of Labor Statistics
Preparing our Children

K-5 BECOMING AWARE

6-8 GAINING REAL SKILL

9-12 EQUIPPED WITH VALUABLE SKILLS

COLLEGE STUDENT
ENTREPRENEUR
TECH WORKFORCE
ALL VERTICALS
GLOBAL CITIZEN
INCOME GAP

$25K
MEDIAN INCOME OF AVERAGE CPS FAMILY

$75K
AVERAGE STARTING TECH SALARY
CLOSE THE GAP

$25K  POVERTY LINE

$95K  AVERAGE TECH SALARY
IMPACT

~400K STUDENTS

~660 SCHOOLS

Economic Development
Economic Empowerment
Social Justice
Rebuild Communities
Making Education Relevant
HOW ARE WE DOING THIS?

CHICAGO STANDS APART

TECS w/ ISU
BATEC
Taste of Computing
CSTA
Accelerate ECSforALL
Validate ECSforALL

GROWING OUR POOL OF TEACHERS

Professional Development
Peer Coaching
Validation
ETC
• Increased the percentage of parents familiar with the selective enrollment process from 14 percent to 83 percent, with 100 percent of parents aware where to look for further resources.

• Improved Henderson students’ average attendance, NWEA math scores and GPAs.
OUR RESULT
CS4All Chicago

#CS4allCPS

CS4All.io

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