Deficit of Qualified Security and IT Auditing People

Building a Pipeline of Talent

John South
CSO
Heartland
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Rumors

Heard any rumors lately?

Fact vs. Fiction

Have you heard this one:

There is a deficit of security people in the North Texas area

Fact or Fiction?

Basic Statistics

The hypothesis that I started with was that there is, in fact, a deficit of security personnel in the North Texas area.

If this proved to be true, what are the short-term contributing factors and consequences?

What is a long-term strategy for fixing the problem?

Is it a fact?

Security Positions

- (Sr.) (Information) Security Analysts
- Security Architects
- Security Engineers
- Security Managers
- Network Security Engineers
- Security Operations Analysts
- IT Security Auditors
- Data Analysts
-
-
-
- Chief (Information) Security Officers

Assumption

- What's the assumption that is fundamental in any security strategy?

That you have a body to perform the function

- What is your strategy if you don't have enough bodies to fill the positions in your security team?

Automate?
Augment?

Pray?

Endemic Problem in Industry

We often have to tailor our security strategy to fit the budget that we are provided.

Are there factors that have an impact on what budget the company is willing to spend?

Breaches
Economic Impacts
Organization

Oversight Attentiveness
Business Disruptors
Other Priorities

Let's break this down a bit

- Bureau of Labor Statistics estimates 1.4 million openings in the IT workforce by 2020.
- However, only 400,000 computer science graduates with necessary skills to fill the positions
- However, we are already feeling the pinch
- 451 Research showed that 34.5% of security managers cited lack of experience for the reason they didn't fill their security positions
- In the DFW area, for some security specialties, the there aren't even poorly qualified candidates

Let's break this down a bit

- Identity Theft Resource Center reports that there have been 577 reported breaches amounting to 155,825,425 (as of 9/29/2015).

  www.idtheftcenter.org/images/breach/ITRCBreachStatsReportSummary2015.pdf

- We are seeing an increased interest on the part of CEO and senior executives to increase their security investments
  - 76% were concerned about cybersecurity threats (59% in 2014)

  PwC, 2015 U.S. State of Cybercrime Survey

- BDO USA, LLP reported the 67% of CEOs dedicated money to cybersecurity

Let's break this down a bit

- BDO USA, LLP reported the 67% of CEOs dedicated money to cybersecurity

- Of those who upped spending:
  - 90% purchased new security tools
  - 72% created a formal response plan
  - About half of them turned to external security consultants
  - 30% hired a Chief Security Officer

http://https://www.bdo.com/news/2015-march/tech-cfos-counter-cybersecurity-threats

Let's focus in on NTX

Supply & Demand Report Overview

Security Engineer OR Analyst

Dallas, TX (within a 30 mile radius) for December 2014 to November 2015

Supply	Demand
516	2,925
Active Candidates	Job Postings

7,549 Total Available Workforce

4,862 Computer Network Architects

2,687 Information Security Analysts

Hiring Indicator

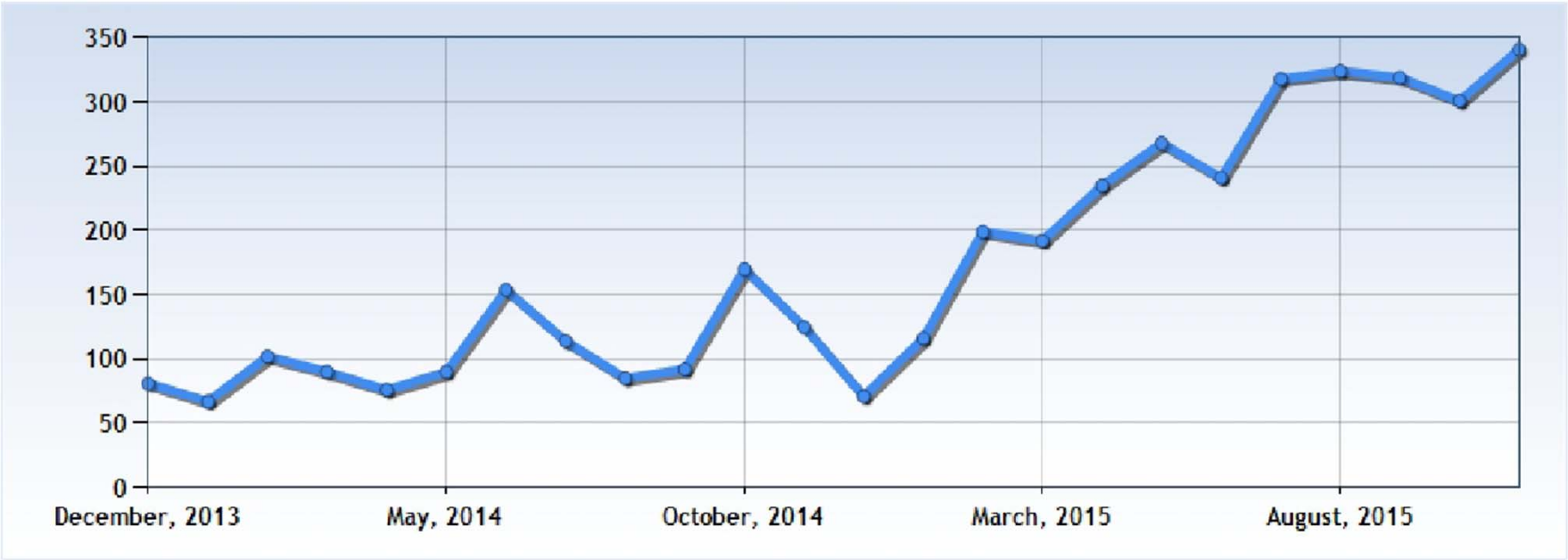
37

Harder to Recruit — Easier to Recruit

Job Postings

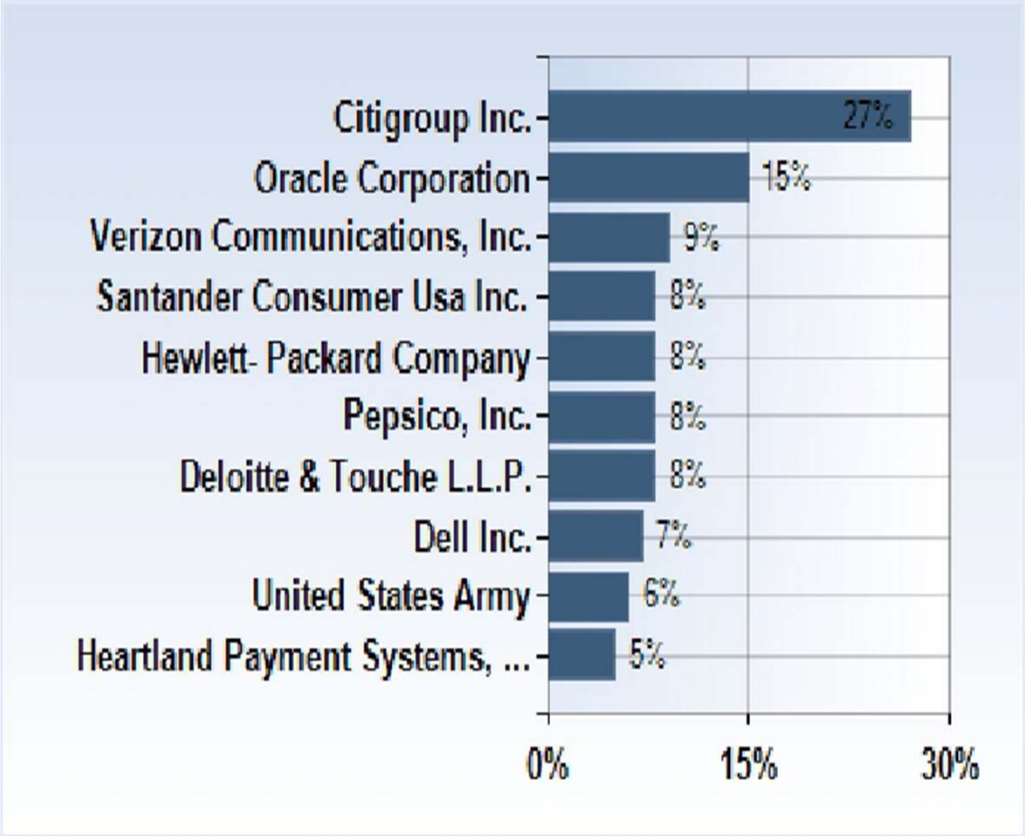
Job Posting Trend Over Last 24 Months

Demand for Job Seekers: Below are the job posting trends over past 24 months for Security Engineer OR Analyst in Dallas, TX.



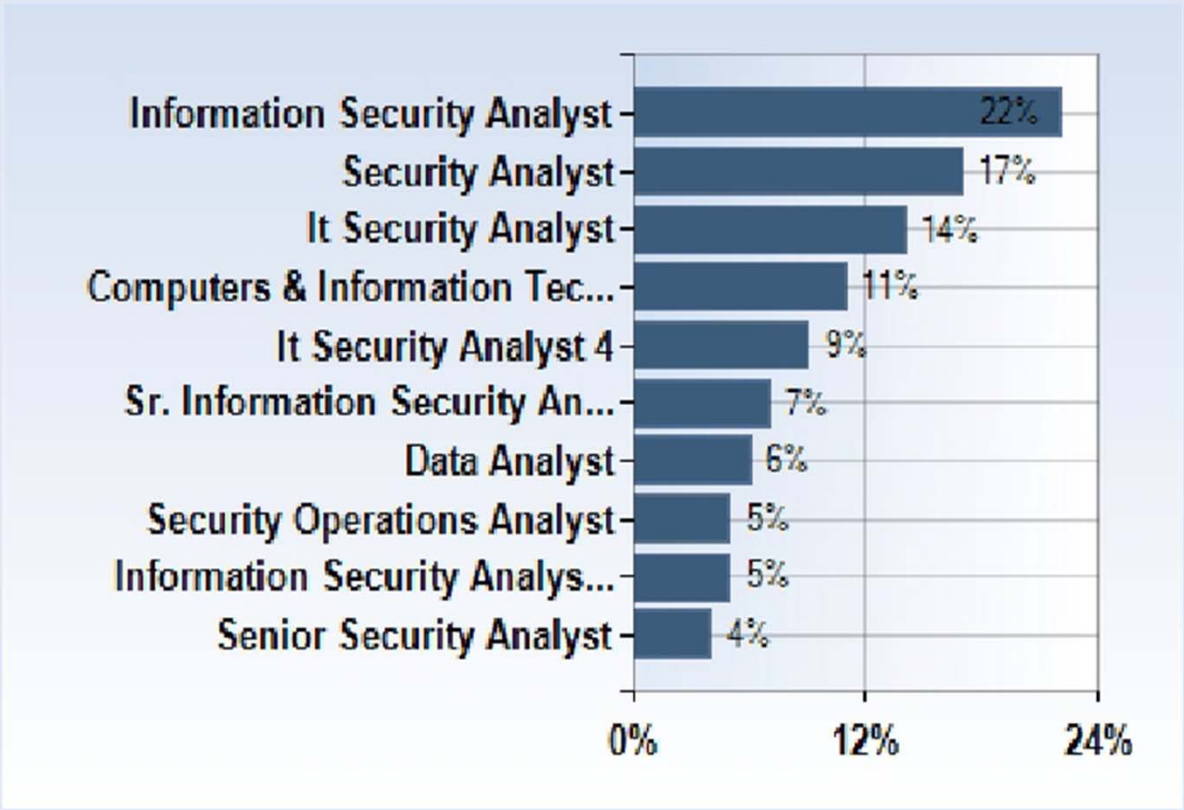
Job Posters

Top Job Posters For Last 1 Year



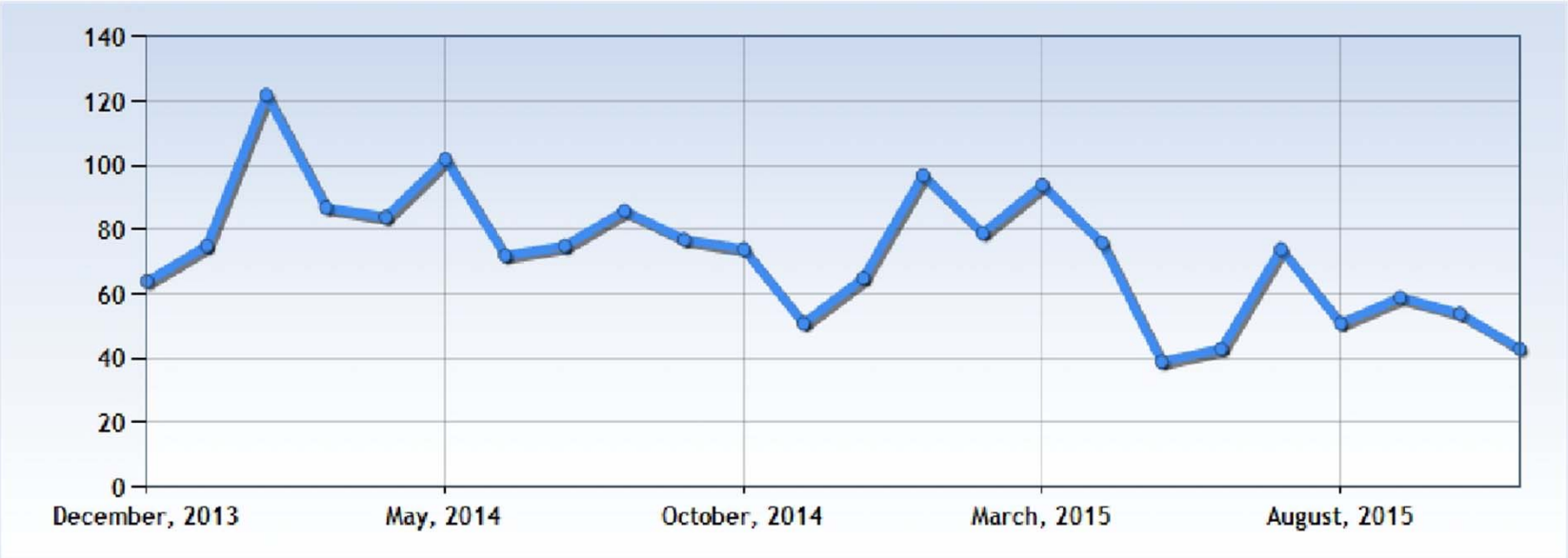
Top Job Titles

Top Job Titles For Last 1 Year

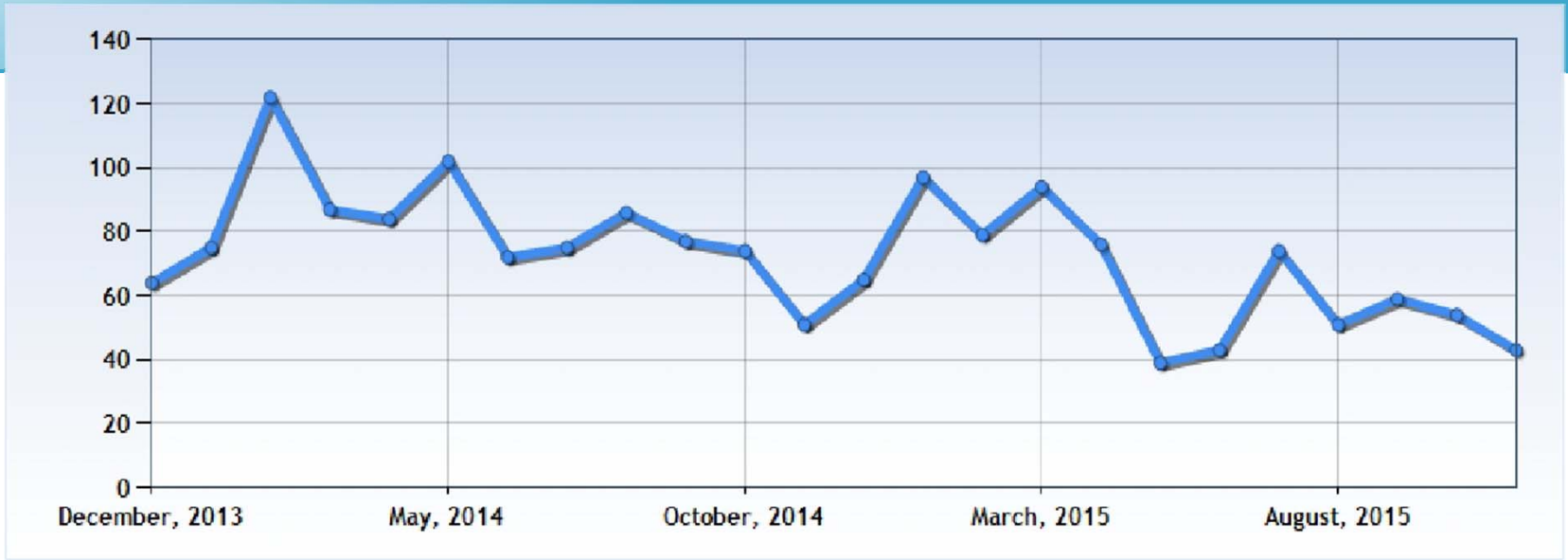


Supply

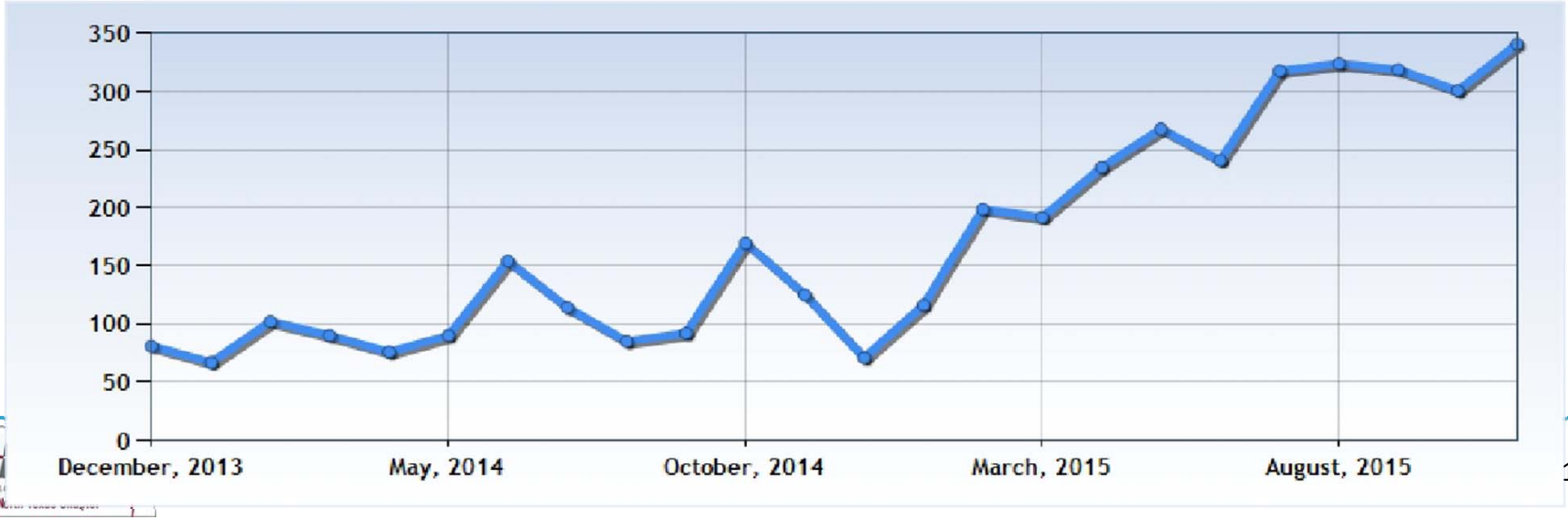
Active Workforce Trend Over Last 24 Months
Security Job Seekers in Dallas, Tx



Supply

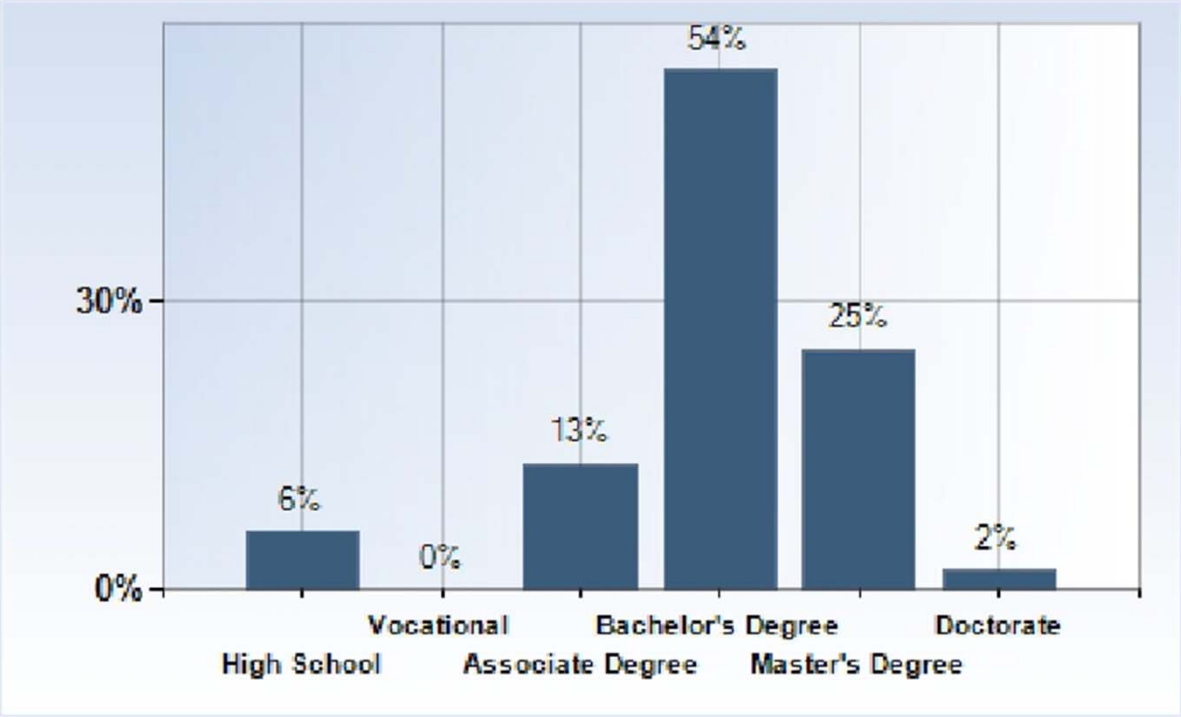


Demand



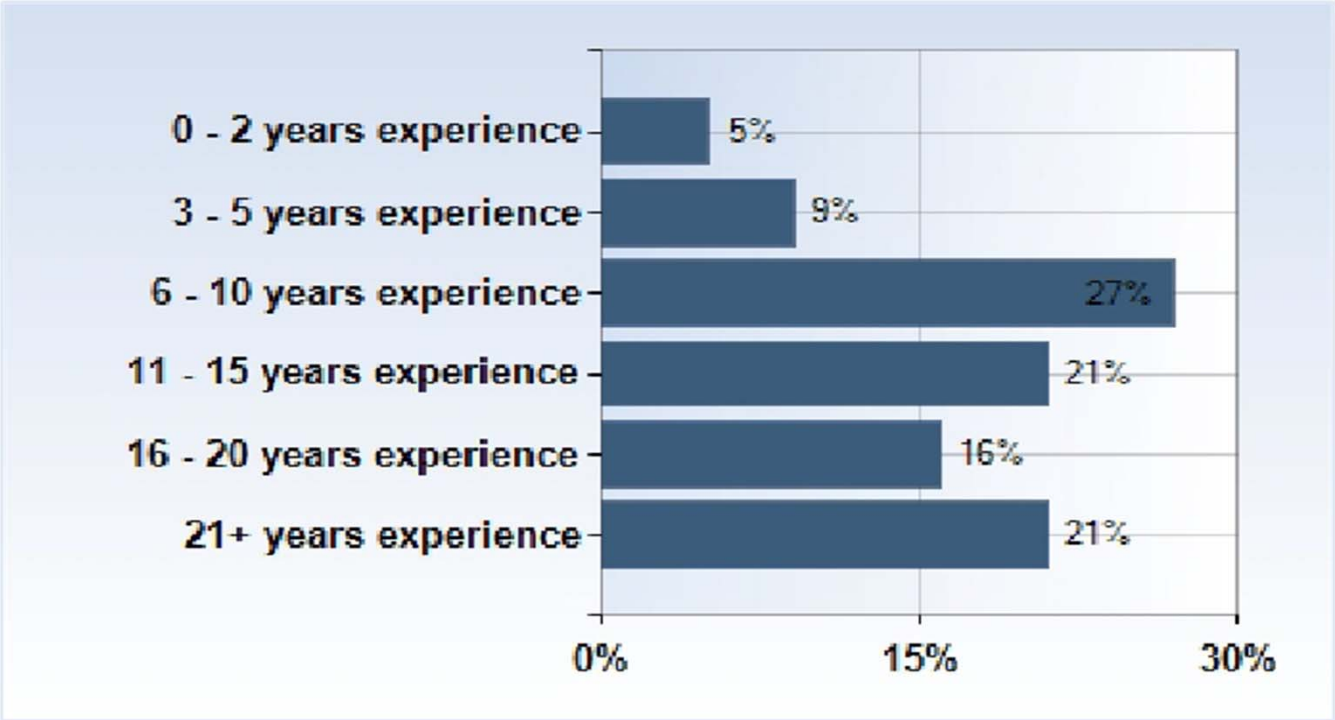
Educational Levels

Active Workforce by Education Level For Last 1 Year



Experience Levels

Active Workforce by Years of Experience For Last 1 Year



By Metro Areas

Active Workforce in Top MSAs For Last 1 Year

Metro Area (MSA)	Count
Washington D.C. Metro Area	1,819
Greater New York City Area	844
Greater Atlanta Area	681
Dallas/Fort Worth Area	620
Greater Chicago Area	595
Baltimore Maryland Area	407
Greater Philadelphia Area	402
Houston Texas Area	372
Greater Los Angeles Area	361
Phoenix Arizona Area	307

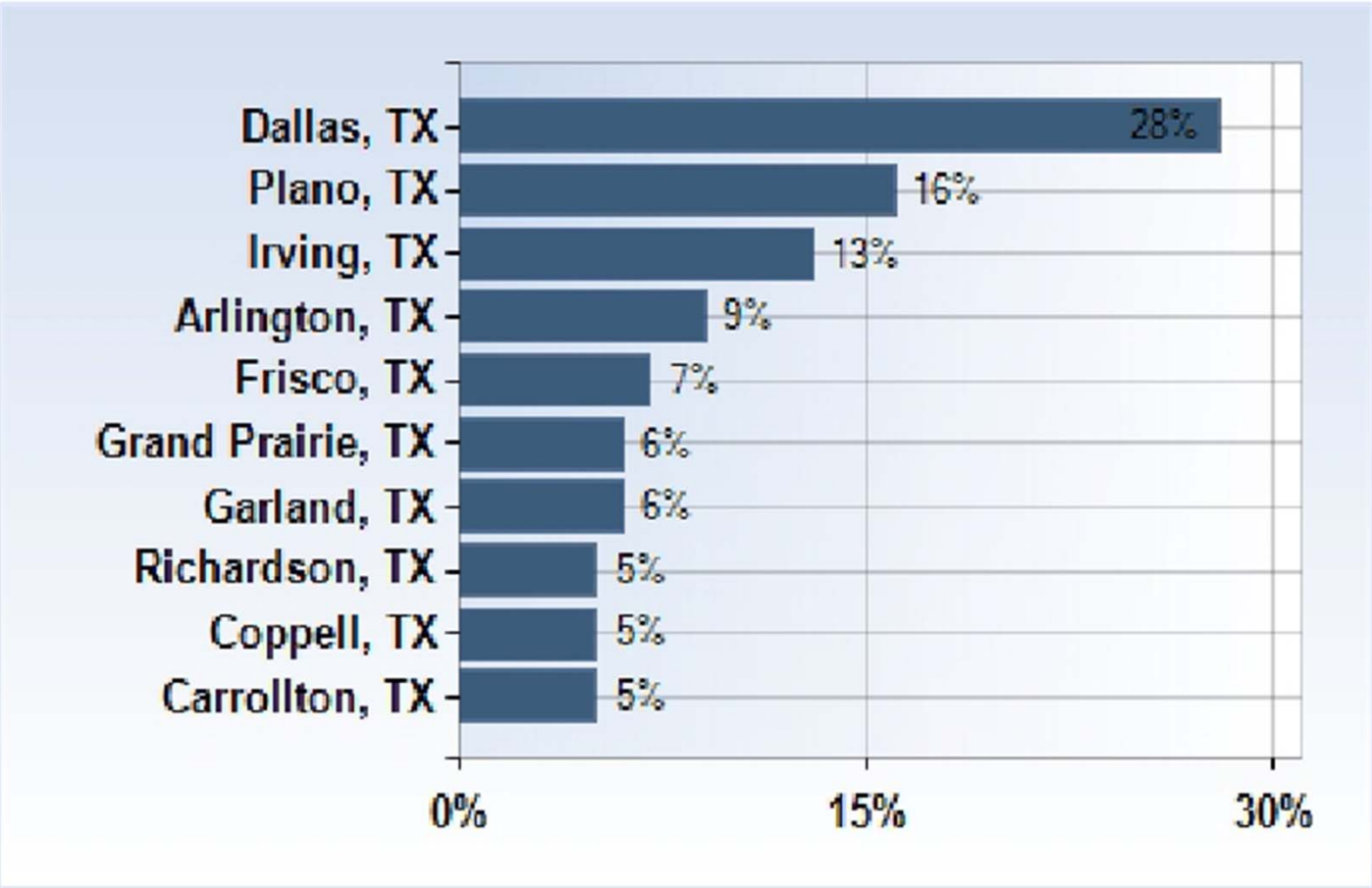
By States

Active Workforce in Top States For Last 1 Year

State	Count
Texas	1,388
Virginia	1,372
Maryland	1,122
California	1,011
Florida	944
Georgia	843
Illinois	727
New Jersey	644
New York	522
Pennsylvania	506

Top Cities in NTX

Active Workforce in Top Cities For Last 1 Year



Market Analysis:
Information Security

January, 2016

Dallas-Ft. Worth Labor Market

What is the security employment situation in the DFW area?

- 739 Active Candidates (active in CareerBuilder database) in the DFW Market in the past year
- 2,800 total InfoSec workers in DFW (Bureau of Labor Statistics)
- 7,856 Job Postings in the past year
- Less than 10% willing to relocate
- Steady increase in demand
- Average Salary is $104K

Notable increase in demand surrounding large security breaches

- ebay (May 2014)
- JPMC (August 2014)
- IRS (May 2015)

Most in-demand skillsets

- Network Security Engineer
- Info Sec Analyst
- IT Security Analyst
- Info Sec Engineer
- Info Sec Manager

Do you have an estimate of how many women are participating in the security field?

- Women make up about 11% of all InfoSec jobs in the US
- Overall women make up about 25% of all IT jobs in the US

Have you seen any specific efforts to recruit and train women to go into the field?

- Identifying and partnering with diverse professional organizations and user groups and begin building relationships with the members.
- Partnering in some markets with organizations that target girls to introduce them to IT (coding, etc) at a young age to encourage them to pursue a career in IT later.

Any associations focused on women in security?

- http://www.awisec.org/
- http://womenscyberjutsu.org/
- Associations below are very good but not gender specific
- http://cybersecurityventures.com/cybersecurity-associations/
- https://www.isc2cares.org/uploadedFiles/wwwisc2caresorg/Content/Women-in-the-Information-Security-Profession-GISWS-Subreport.pdf
- https://www.issa.org/

Let's break this down a bit further

- Over the last 5 years – 90% increase in demand for cybersecurity professionals – roughly 3x the growth rate of the field itself (Burning Grass Technologies)

- The high job rate has directly impacted universities who are creating cybersecurity programs

  - 744 offer something from a certificate to a Ph.D.
  - US News & World Report ranked Information Security Analysts as 8th in the top 100 best jobs in America – growth rate 36.5%

http://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs

These numbers concern me. Why?

Lack of action

- It takes a relatively long time to turn the ship of academic institution.
- Programs are developed a year or two in advance
  - Curricula have to be developed, texts determined and professors assigned to teach the course
  - You also have to change the “culture” of the impacted departments
- But more importantly, you have to have a student base interested in cyber security, IT or any other cyber technical field ($$$$)

Let's move backwards in our equation

- We have an mathematical statement that we want to eventually rationalize:

- Growth rate of profession ≤ number of students graduating with security degrees ≤ number of students graduating with science and technology degrees (This is where we would like to be).

- Here's the rub. The number of students graduating with science related degrees is anemic

- And…the overall quality of our students is suffering.

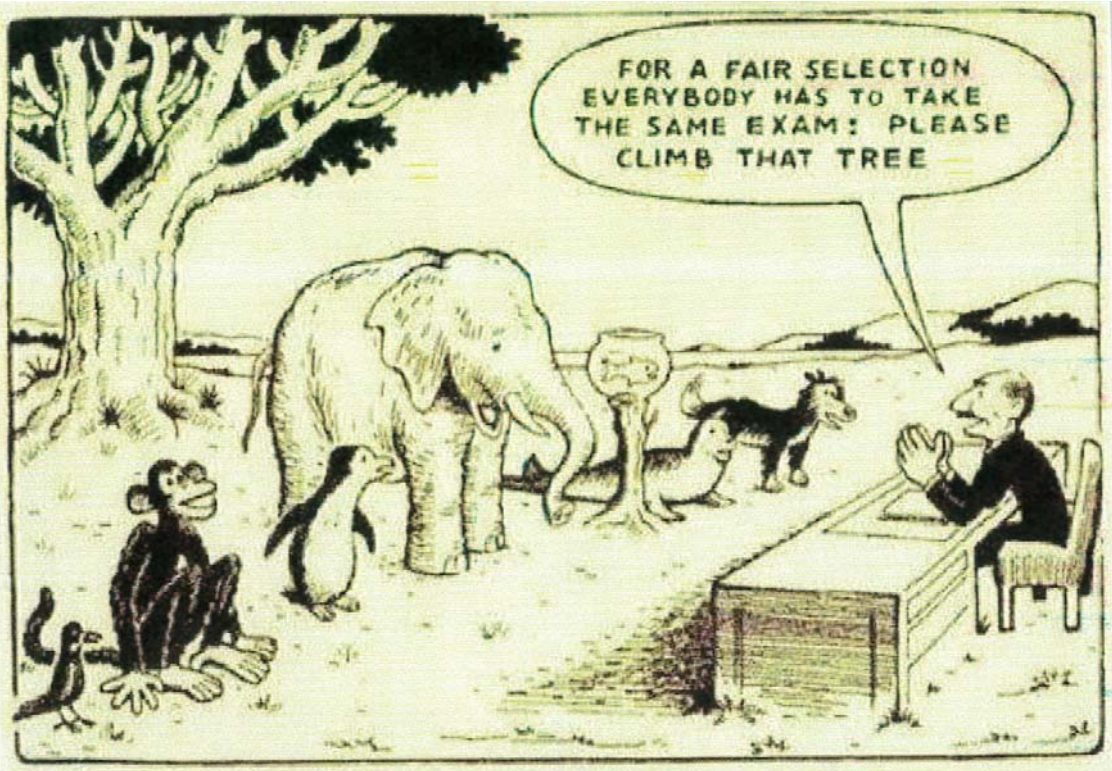
Let's move backwards in our equation

- The quality of our educational process is moving backwards, not forward
  - 44% of US high school graduates were ready for college-level math
  - 36% ready for ready for college-level science
  - 19.5% of Advanced Placement test takers in the class of 2012 earned a qualifying score on an AP exam
  - 38% of students in higher education who start with a STEM major do not graduate with one

https://www.nms.org/AboutNMSI/TheSTEMCrisis/STEMEducationStatistics.aspx

  - Why are these rates so abysmal?

Abysmal Education = Abysmal Students



Our Education System

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid."

- Albert Einstein

Abysmal Education = Abysmal Students

- We have lowered our education levels to the LCD
- We try so hard to ensure that no is left behind, we don't challenge the really gifted (unless they are lucky enough to get into a gifted program)
- More importantly, the quality of what and how we teach our children in the sciences is also deficient.
  - In 2007, about 1/3 of public middle school teachers did not major in or specialize in the science that they were teaching
- We make science boring – memorize this chemical equation or this mathematical theorem. This turns kids off to the sciences - fast

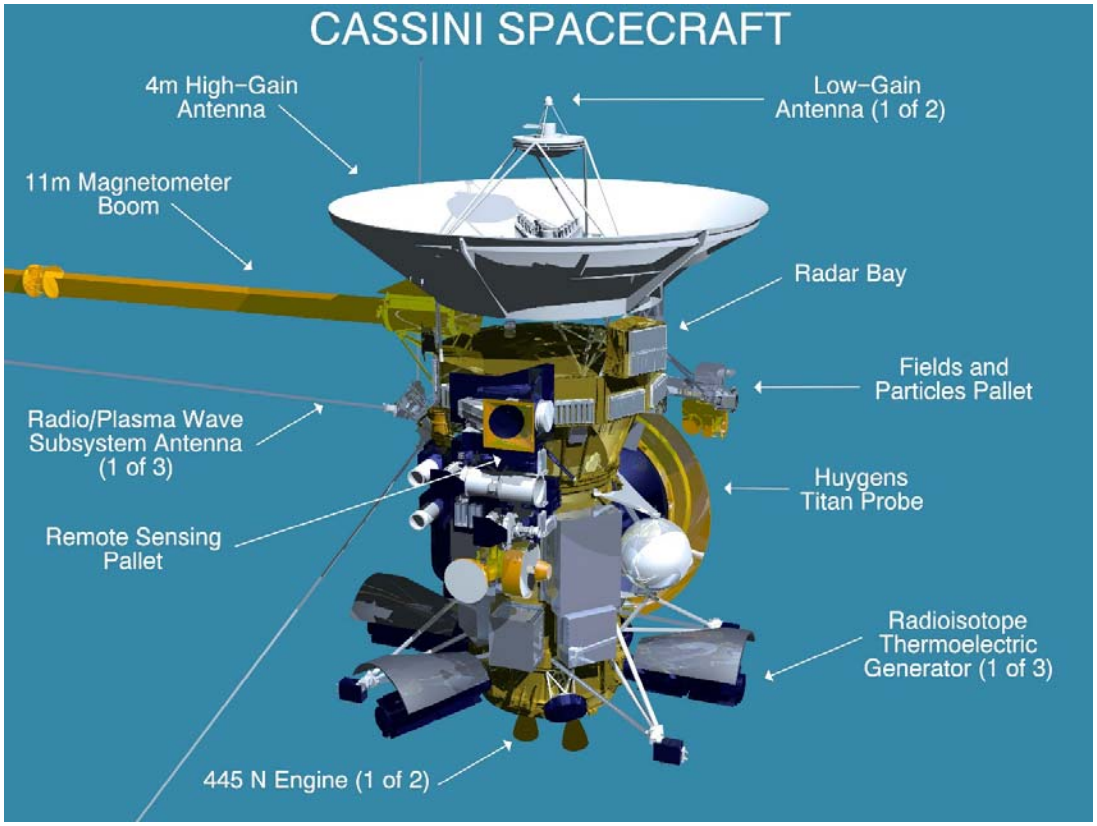
Abysmal Education = Abysmal Students

- Why is it important to really turn kids on to the STEM subjects as early as elementary school, middle school at the latest?

- Let's look at an example for what happens when it all clicks.

Science education pays off

Cassini spacecraft was launched October 15, 1997



Entered orbit around Saturn on July 1, 2004

December 25, 2004, Huygens separated from Cassini and landed on Titan on January 14, 2005

Science education pays off

Marco Mastroguiseppe

Jason Hofgartner

- Cassini carries a RADAR capable of measuring not only surface features but also depth of methane lakes on Titan
- Both of these researchers were in middle school when Cassini was launched!

Astronomy, Oct, 2015, pp 28-29

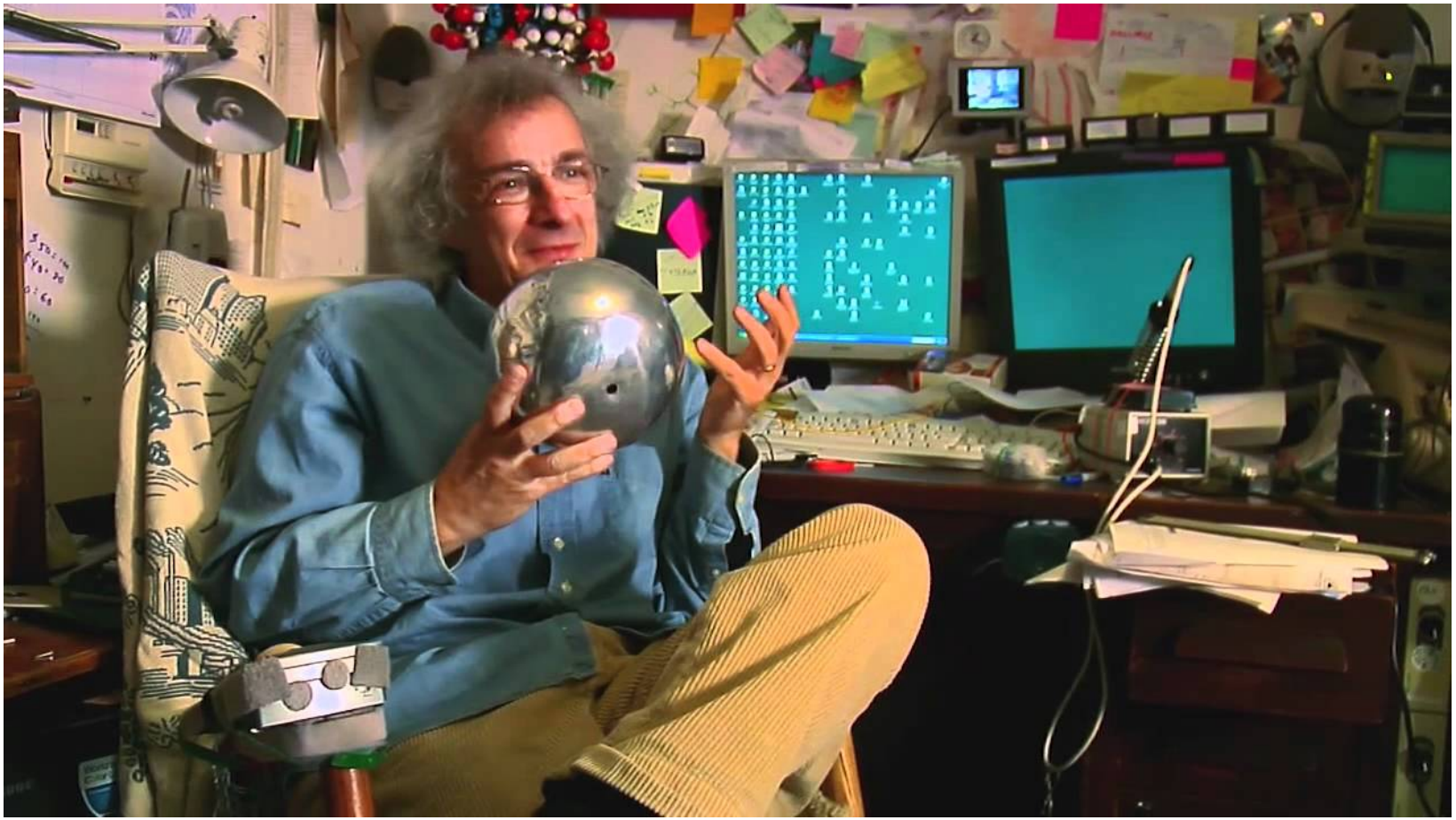
What are we missing in the equation

- We have a restrained and antiquated science pedagogy in our middle and high school programs

- We teach facts and figures with limited hands-on training
- Reasons
  - Time
  - Curriculum restrictions
  - Dedicated, but perhaps under-trained teachers

- Enter Clifford Stoll

I feel that there's a massive and bizarre idea going around that we have to bring more computers into schools. My idea is: no! No! Get them out of schools, and keep them out of schools. And I'd love to talk about this, but I think the argument is so obvious to anyone who's hung around a fourth grade classroom that it doesn't need much talking about -- but I guess I may be very wrong about that, and everything else that I've said. So don't go back and read my dissertation. It probably has lies in it as well.



https://www.**ted**.com/**talks**/**clifford_stoll**_on_everything?language=en

Imagine, design, plan, make and play

- Let's take the last point first (and last)

PLAY

- We no longer teach our children to how to play
- BS meters just hit maximum

Imagine, design, plan, make and play

- Our son/daughter/other plays

Organized sports

- Nothing wrong with organized sports at all.
- It's a great way for kids to learn teamwork, get physical activity and for a lucky few may open up opportunities that may not have been available to them otherwise.

Imagine, design, plan, make and play

- We have to keep this is context for our kids

  How many kids actually get an the opportunity from organized sports?

- The odds are NOT in their favor.

Imagine, design, plan, make and play

Student Athletes	Men's Basketball	Women's Basketball	Football	Baseball	Men's Ice Hockey	Men's Soccer
Percent High School to NCAA	3.3%	3.7%	6.5%	6.8%	11.3	5.7
Percent NCAA to Professional	1.2%	0.9%	1.6%	9.4%	0.8%	1.9%
Percent High School to Professional	0.03%	0.03%	0.08%	0.50%	0.07%	0.09%

NCAA Research, Estimated Probability of Competing in Athletics Beyond the High School Interscholastic Level, Updated 9/29/2013

Imagine, design, plan, make and play

- Obviously not referring to that type of “play”
- What I’m referring to is Play that

Stimulates
Inspires curiosity
Fundamental learning component

Redevelop Context!

Imagine, design, plan, make and play

- Call it what you will

Tinkering

Hands on exercises

Futzing around

Imagine, design, plan, make and play

- This brings us back to

Imagine

Imagine, design, plan, make and play

- San Francisco's Exploratorium

Imagine, design, plan, make and play

- People can take these interactive experiences and their imagination to fuel their creative juices

Design

Imagine, design, plan, make and play

- People can take these interactive experiences and their imagination to fuel their creative juices

Plan

Imagine, design, plan, make and play

- Keystone to what we are missing in today's educational process

Imagination + Design + Plan + Make =

Critical Thinking

Bringing us back to today

- Critical thinking is one of the most important assets of a security person

- How do we find people with that skill?
- Do we test for that skill today?

- Certainly in shops like Google, interns are tested for their creativity, imagination, resourcefulness and aptitude

- But that's fairly rare

- Most companies hire interns, give them assignments and judge their capabilities from the quality of their work – but they don't invest the time to look at their underlying motivations and creativity.

Bringing us back to today

- Identified three problems in all of this
  - We don't have enough people to fill all of the security positions that we have today
  - The critical thinking skills of many of our applicants is an unknown factor
  - Our educational system is failing to inspire our children in the sciences

Tying it all together

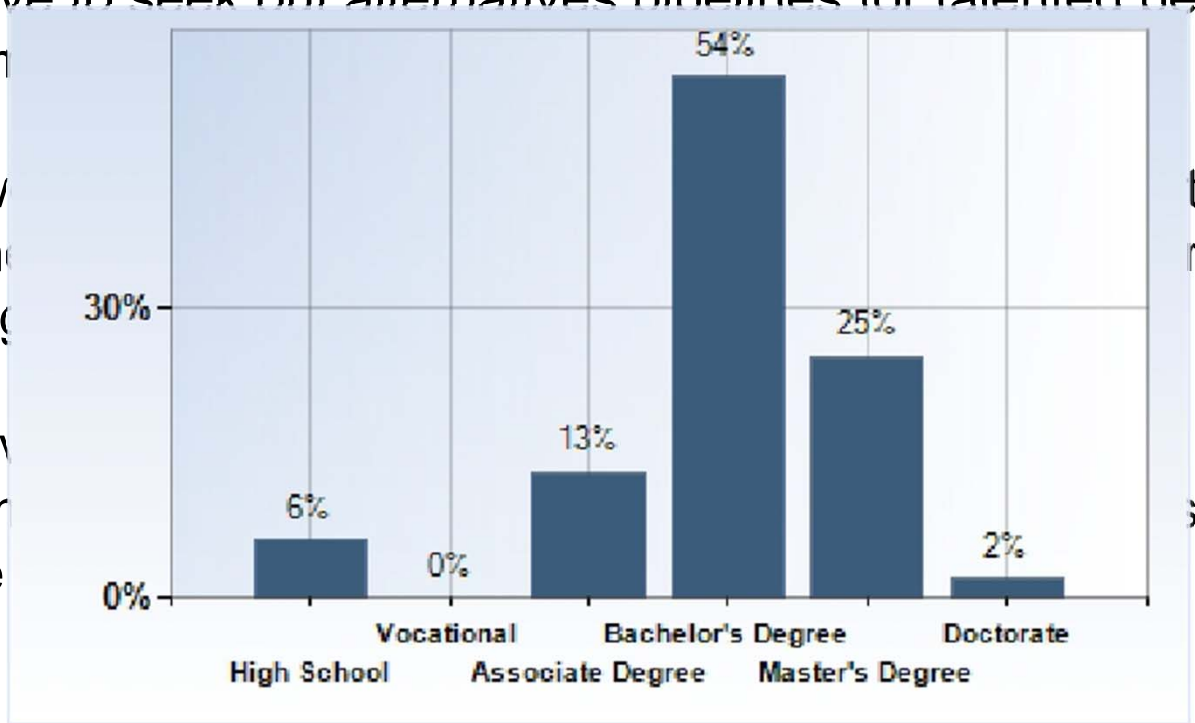
- We have to inspire childlren at an early age to enjoy not only science, but also to enjoy LEARNING about science
- We have to help them learn critical thinking skills starting off by teaching them how to play
- We have to build security into everything they learn about science, so they always have security as part of their thinking
- Schools, particularly universities, need to address security as a curriculum and a research target

Tying it all together

- We have to seek out alternatives pipelines for talented people that could n

- If we w them – take th ritical thinkin

- We hav take risk on som security people



Tying it all together

- Most importantly…....

…we have to be willing to plant trees under whose shade we will never sit.

Ty Burley (David Strahairn) *The Second Best Exotic Marigold Hotel*

Questions