



# **Engineers and Scientists Are Different: Their Training Should Be, As Well!**

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Chuck Sobey

Tim Perkins

May 18, 2015, Session M218

Starkey Hearing Technologies and ChannelScience

Too much attention to detail; struggle with the “big picture”.

Negative; comments always focused on the negative perspective.

Focus on the data







Starkey Hearing Technologies is the only American manufacturer of hearing aids.

Driven to provide the gift of hearing throughout the world.

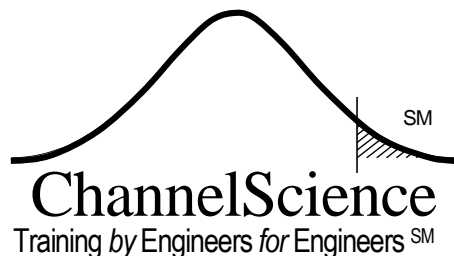


**Rick Rittmaster**, *Sr. Learning & Development Specialist*  
Been with Starkey since 2010.

Partners with business leaders, individual employees, and external vendors to provide effective/impactful training and development solutions.

Engineers and Scientists *are* different.

Training for engineers and scientists *should* be different as well.



Technology consulting firm since 1996  
Data storage industry (math and physics)

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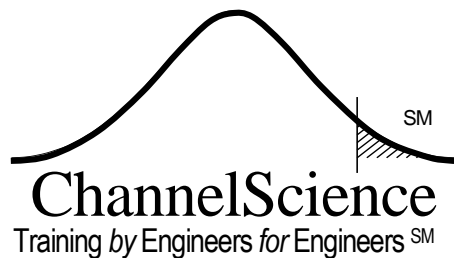
- Chuck Sobey, Chief Scientist
  - Develops emerging storage technologies
  - Writes and teaches technology classes for working engineers and scientists
  - Board member of annual Silicon Valley technology conference

[www.FlashMemorySummit.com](http://www.FlashMemorySummit.com)

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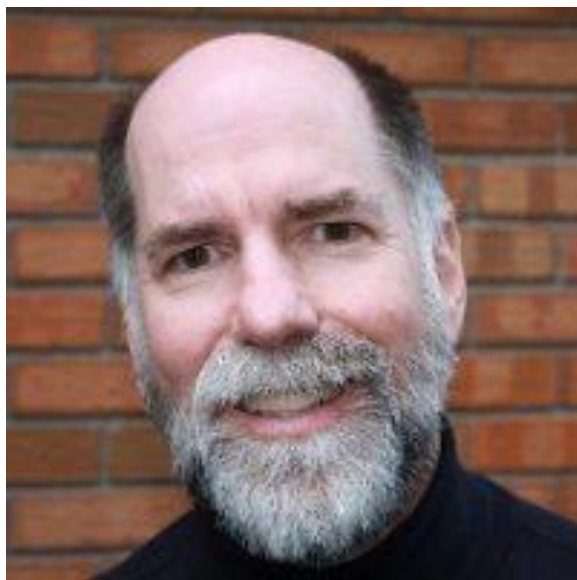
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[www.twitter.com/ChannelScience](http://www.twitter.com/ChannelScience)



- Tim Perkins: co-author
- meet at ChannelScience booth #309

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- Develops and validates metrics used to facilitate research in diverse areas:
  - Behavioral Finance
  - Cyber Forensic Tools
  - Data Storage Devices

[perkinstim@comcast.net](mailto:perkinstim@comcast.net)

# Learning Objectives

1. Break through the training stereotypes about engineers and scientists
2. Explore a worked example of how technical hard skills were used to improve presentation/soft skills
3. Leverage your technical talent's hard skills to improve their soft skills/leadership effectiveness



# **LO1: Break through the Training Stereotypes**

about Engineers and Scientists

(and other STEM/STEAM professionals)



# What is a stereotype?

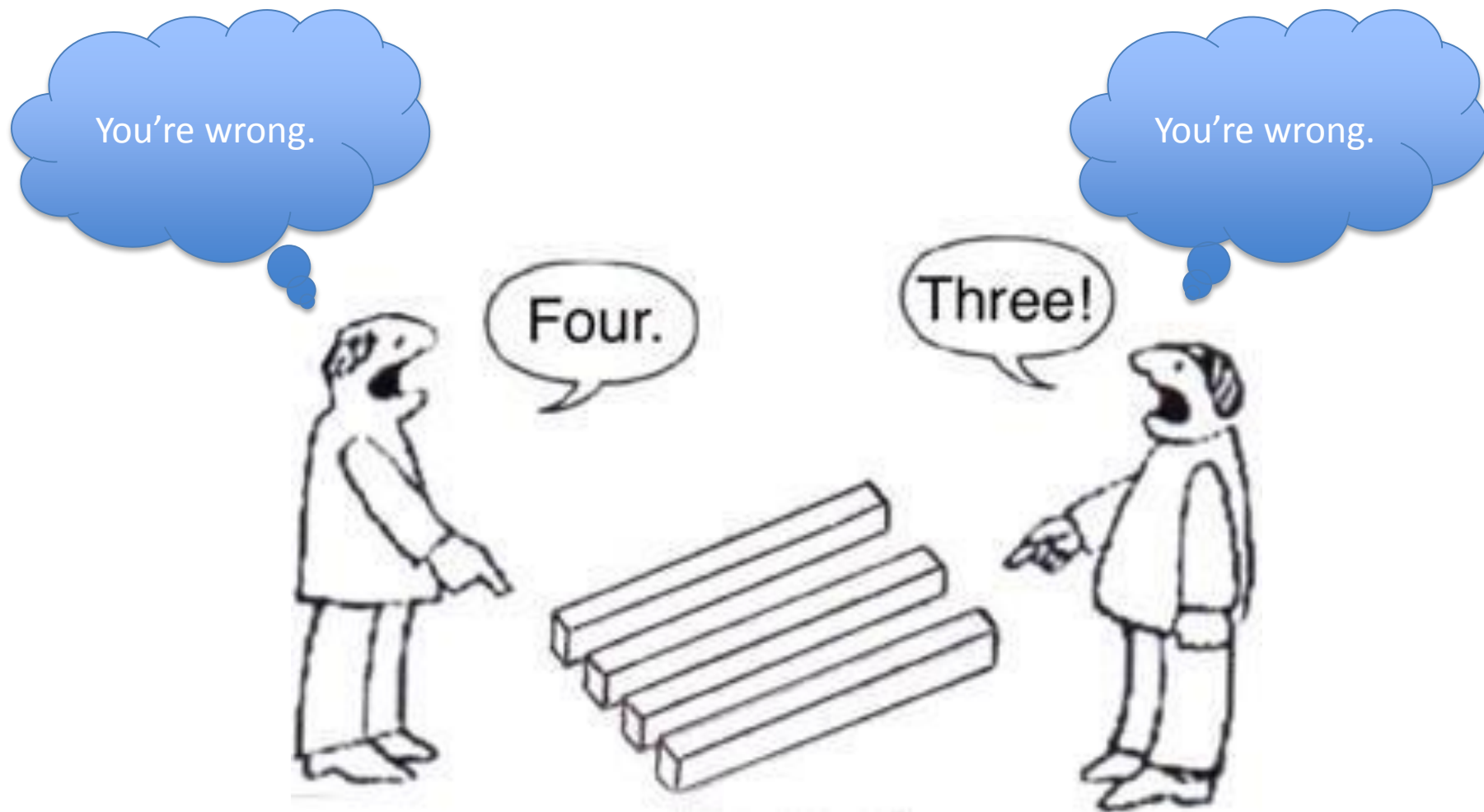
- A stereotype has two elements
  - *A cultural evaluation*
  - *An expectation of certain behavior*



# What is a stereotype?

- A stereotype has two elements
  - *A cultural evaluation*
    - There are many different “cultures” within any one organization.
  - *An expectation of certain behavior*
    - Organizations are evaluation-intensive environments.
    - Lack of appreciation around cultural differences breeds negative evaluations.

Reference: “Stereotype threat in organizations”



Trainer

Technical Employee

Left unchecked, stereotypes are formed based on negative evaluations.

Breaking through stereotypes provides a *more effective* training solution.



# Steps to break through stereotypes

1. Acknowledge the stereotypes



2. Identify the positive skills that are behind these stereotypes



3. Utilize these skills to develop more effective training

# 1. Acknowledge the stereotype

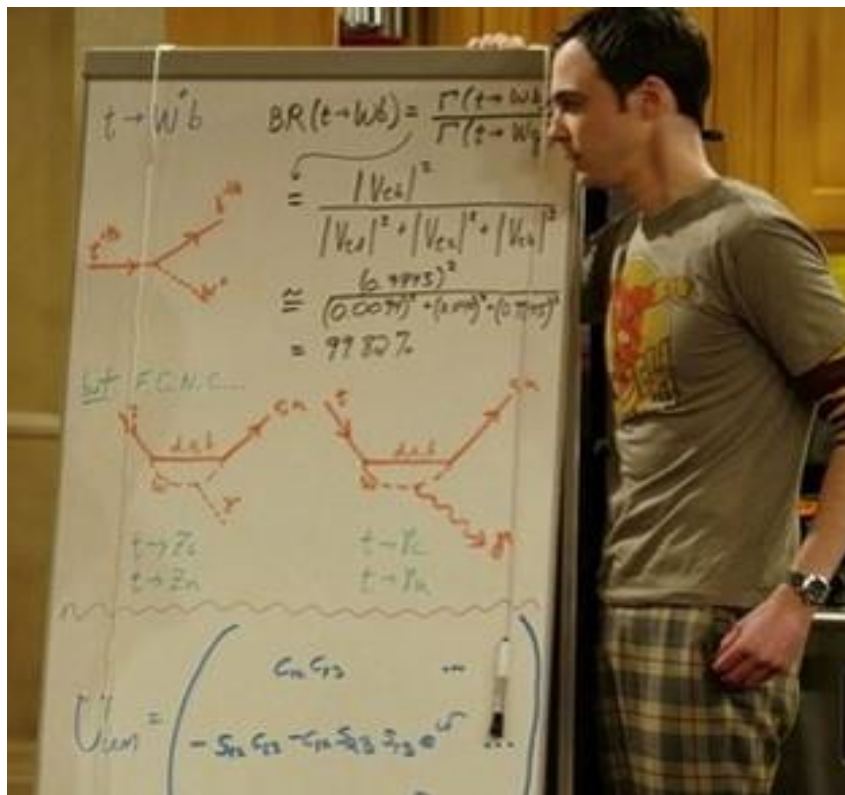
Stuck in their comfort zone

Always sees the negative

Reluctant to improve soft skills

Resistant to change

Others...



## *Is this in your comfort zone???*

**Statement 2: "Sally always gets the interesting projects, and I always get the leftovers."**

Empathy Statement:

I understand. It sounds like you are feeling \_\_\_\_\_.

Clarification Statement:

Can you give me an example of \_\_\_\_\_?

Providing Feedback:

So, you are feeling \_\_\_\_\_, and would like \_\_\_\_\_.

## *Is this in your comfort zone???*

5. Sand is dumped off a conveyor belt into a pile at the rate of 2 cubic feet per minute. The sand pile is shaped like a cone whose height and base diameter are always equal. At what rate is the height of the pile growing when the pile is 5 feet high? (The volume of a cone is  $\frac{\pi}{3}r^2h$  where  $r$  is the radius of the base and  $h$  is the height.)



# 1. Acknowledge the stereotype

- What challenges do I encounter when working with engineers and scientists?
- Which training tasks tend to be most challenging to facilitate?
- What makes these training tasks challenging?

# Steps to break through stereotypes

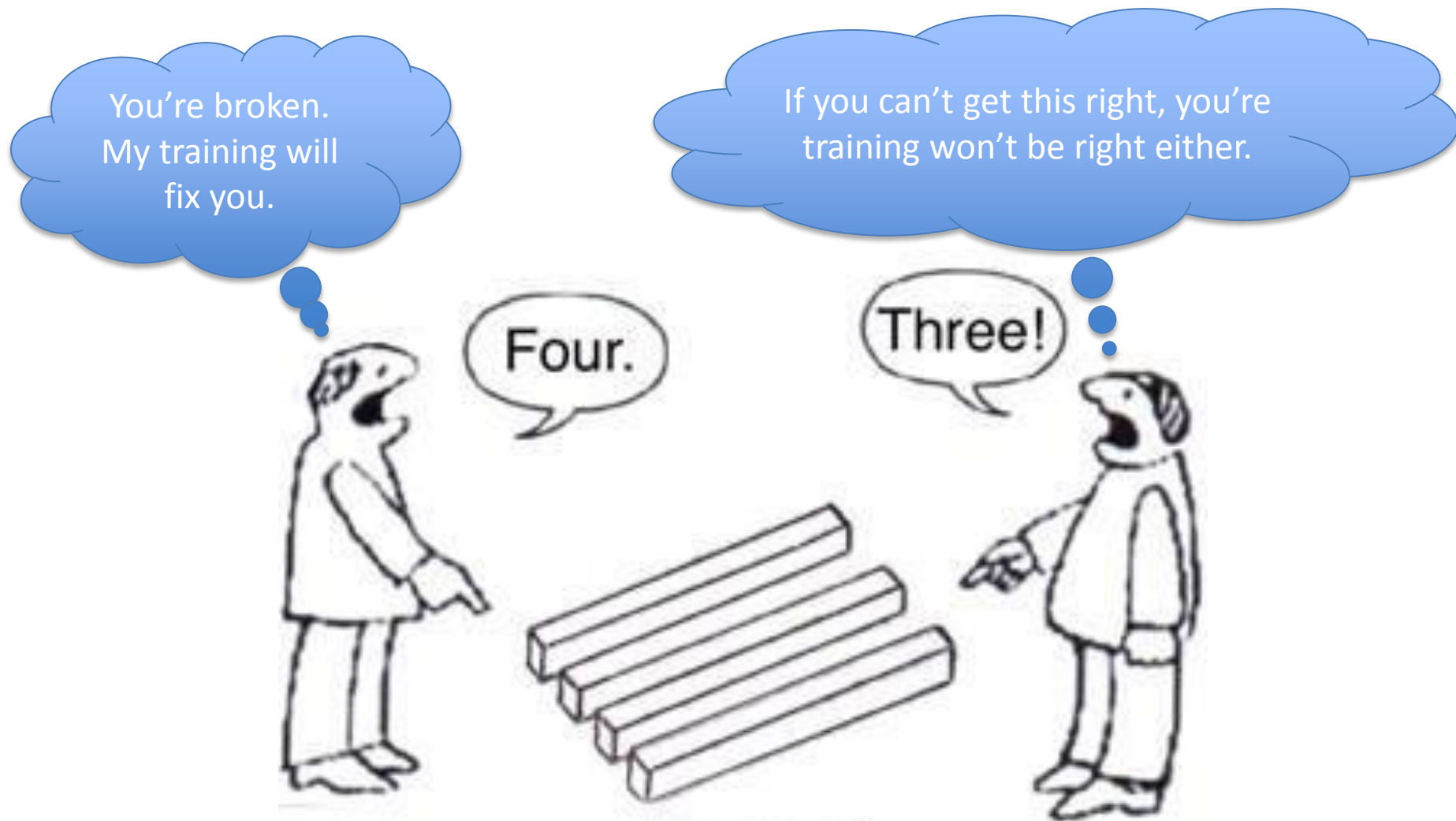
1. Acknowledge the stereotypes



2. Identify the positive skills that are behind these stereotypes



3. Utilize these skills to develop more effective training



Trainer

Technical Employee

## 2. Identify the positive skills that are behind these stereotypes

Stereotype of an engineer	Positive skill
Stuck in comfort zone	Great at creating a consistent process
Always see the negative	Solves the problems before they occur
Reluctant to improve soft skills	Acquires tools/skills when needed to solve a problem
Resistant to change	Great at adapting to a logical argument



## 2. Identify the positive skills that form these stereotypes



*“You’re broken. My training will fix you.”*

## 2. Identify the positive skills that form these stereotypes



# Steps to break through stereotypes

1. Acknowledge the stereotypes



2. Identify the positive skills that are behind these stereotypes



3. Utilize these skills to develop more effective training

## Ask yourself:

- What skills do engineers and scientists already have?
- How can I create a training activity that uses/emphasizes their current skills?
- Does this training activity “promote a stereotype” or “utilize a skill”?



## 3. Utilize these skills to develop more effective training

Positive skill	Training activity
Great at creating a consistent process	Use repeatable, worked examples
Solves the problems before they occur	Situational problem solving
Acquires tools/skills when needed	Teach best practices and domain knowledge, in a relevant context
Great at adapting to a logical argument	Use adaptive feedback

# Breaking through training stereotypes about engineers and scientists

- *Technical employees, as a population in the workforce, have cultural distinctions*
- *Focusing on negative perceptions creates stereotypes*
- *Utilizing the positive skills behind the stereotypes will create a more effective training experience*

# Group Exercise: Break Through STEM Stereotypes

1. Form groups of 3-5 people
2. Identify 3-5 common stereotypical behaviors your group members have directly observed from STEM professionals
3. Pick one of these behaviors and list some positive traits/skills it could reflect
4. Pick one of these traits/skills and discuss how to utilize it to achieve a training objective

# Learn from Each Other

- A few volunteers: Please tell us
  1. The one stereotypical STEM behavior you analyzed
  2. A positive trait or skill it reflects
  3. How you would utilize the trait or skill to achieve a training objective



# LO2: Explore a Worked Example

How Technical (Hard) Skills were  
Used to Improve Presentation (Soft)  
Skills

## Starkey as a Technological Leader

- Recognized innovator in the hearing industry
- Mature, highly sophisticated, technical workgroups
- R&D headcount continues to grow

## Current Training Focus for Technical Teams

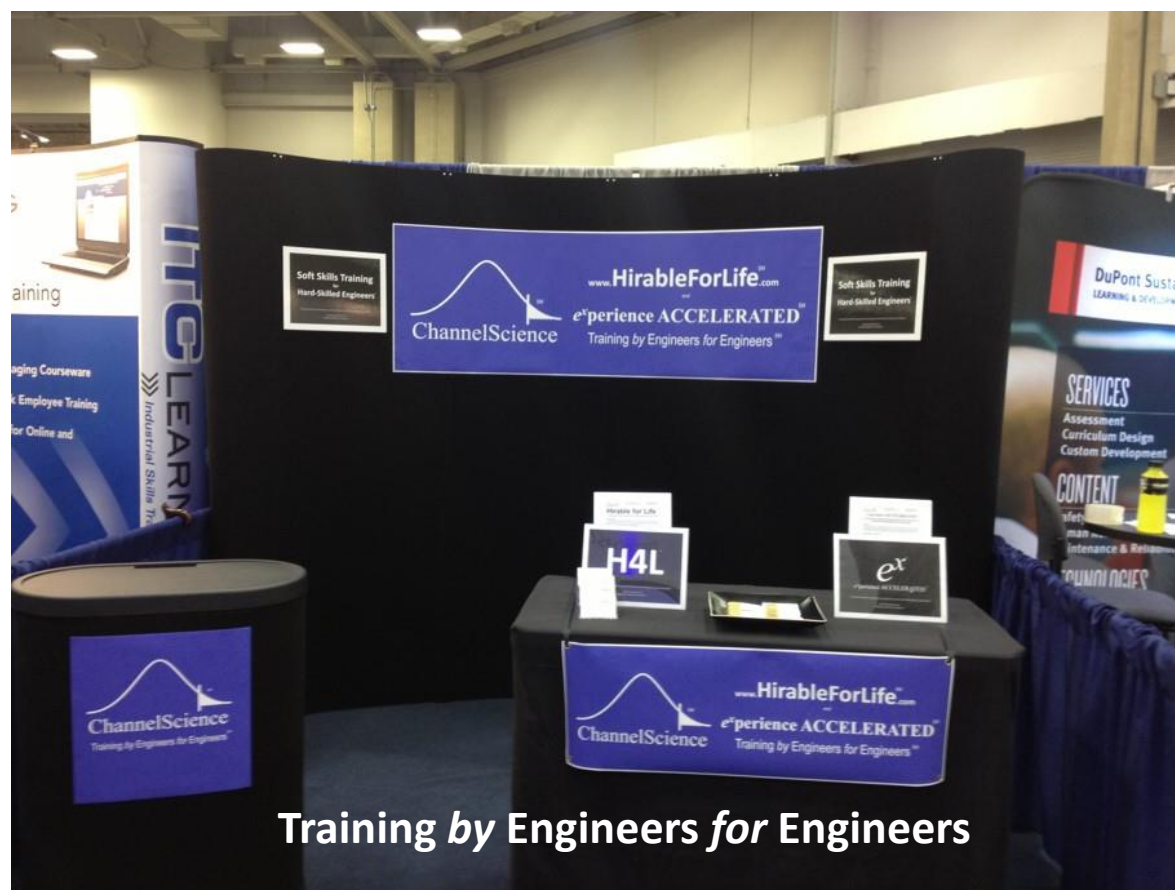
- Leadership
- Cross-functional collaboration
- Communication

## Corporate Goal: Innovation at All Levels

- How could we develop effective presentation skills training that targeted the needs of our engineers and scientists?

Repurposed sales training  
would not be enough.

# 2013: Starkey Meets ChannelScience at ATD (“ASTD”) Booth in Dallas



**ChannelScience  
has taught  
leading-edge  
technologies to  
thousands of top  
engineers and  
scientists**

***Training by Engineers for Engineers***



# Hirable for Life™ (“H4L”): Career Transition and Outplacement Support Workshop



Delft University of Technology,  
Netherlands



Career Transition Workshop,  
Silicon Valley

**A hopeful message, spawned during the Great Recession**

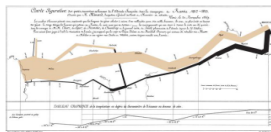
## Starkey's Specific Goals

- “Can you teach presentation skills to engineers?”
  - “Yes – Communication skills are part of H4L already!”
- Create “effective” presentations **for the audience**
  - For technical teams
  - For C-level executives
- Improve confidence level of technical talent
  - Help good presenters use their skills more confidently

# Soft-skills Training for Hard-skilled Engineers and Scientists™

## Engineering Explanations™

A Unique Technical Presentation  
Skills Development Workshop  
for  
Engineers, Scientists, Researchers,  
Developers, and Technologists



"Present less, better."



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A ChannelScience Workbook

Prepared for  
Starkey Hearing Technologies  
Eden Prairie, MN  
August 27 & 28, 2014

Written by  
Charles H. Sobey

- Two 2-day workshops held at Starkey, in the summer of 2014
- 10-12 research scientists in each workshop
- Problem-Solution™ approach to presentations
- Next Goal  
Technical Leadership  
Development workshop:  
“*e*<sup>x</sup>perience ACCELERATED™”

# We Used the Skills Behind these Stereotypes to Improve Presentations!

- Stuck in Comfort Zone
- Focus on the Negative
- Reluctant to Improve Soft-skills
- Resistant to Change



# Stereotype: Focus on the Negative

- Presentations are a waste of time →
  - Presentations are efficient solutions to many problems
- This won't work →
  - So *that's* how to make it work!
- The audience doesn't have the right background to understand this →
  - A smart high school student can understand this

# Behind the “Focus on the Negative” Stereotype

- “Always looking for problems”
- To achieve any goal or discovery, the problems and unknowns must be identified and solved
- Without problems, there is no need for engineers
- If everything were known, there would be no need for scientists

**Solved problems** are stepping stones to the goal!

# Problem Solving Recasts the Perception of Presentations

1. Think like a specific audience member
  - Your boss, peers, customers, CEO, ...
2. Identify that audience's job-related "problems"
  - NOT: "Need data" or "Need status update"
  - "Is the project in budget and on schedule?" "Are additional resources needed?" "Which approach should I fund?"
3. Define what **solves** these problems
4. Create a presentation (when warranted) that most clearly solves these problems

# Stereotype: Reluctant to Improve Soft-skills

- “Slimy” sales techniques →
  - Problem-solving tools
- Not what the company pays me for →
  - Presentation skills increase my value to our company
- Do I *have* to go? →
  - I’ll recommend this to my peers!

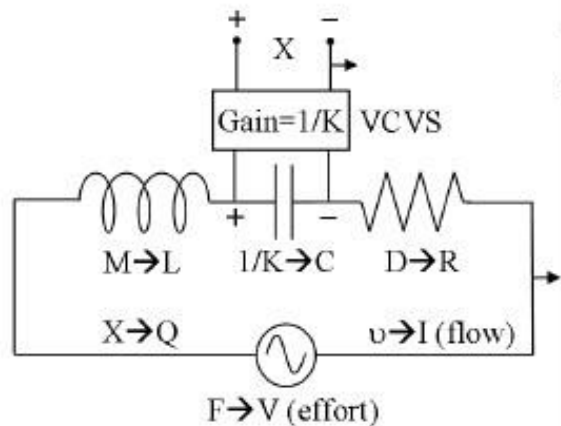


# Behind the “Reluctant to Improve Soft-skills” Stereotype

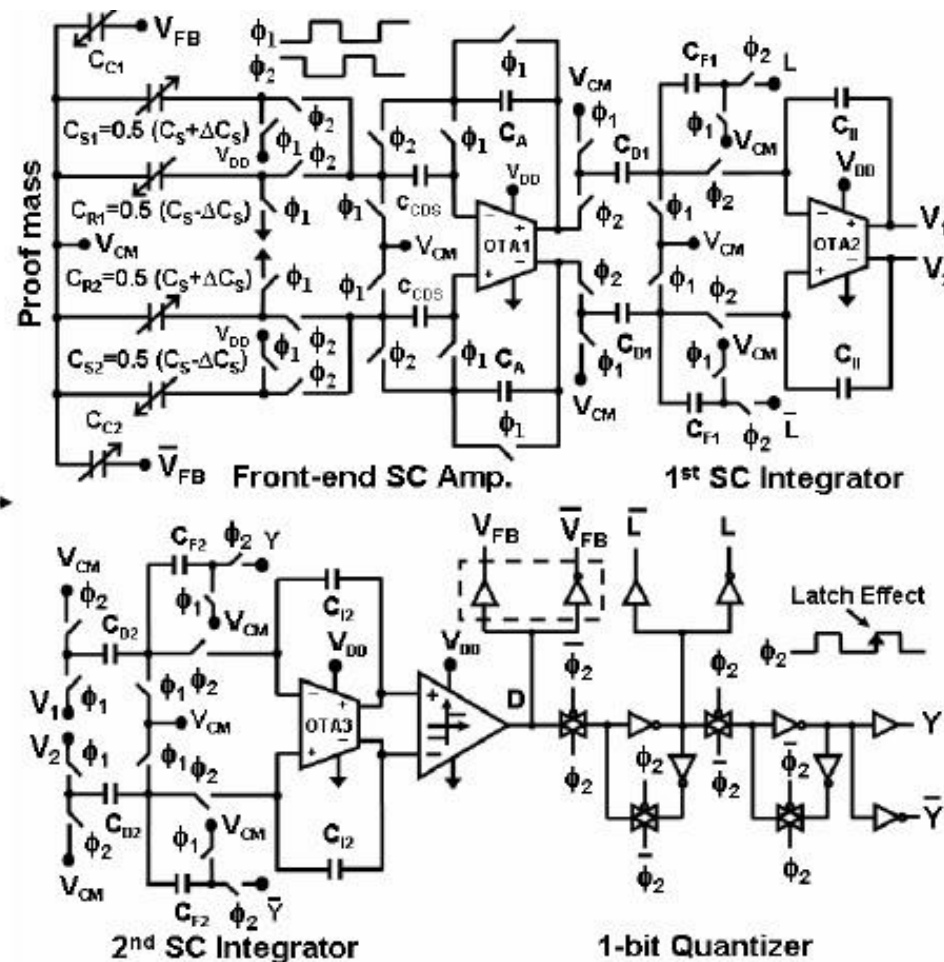
- No perceived need
- Previous soft-skills classes have been irrelevant, embarrassing, ineffective, ...
- Rules like “3-5 bullet items, with 5-7 words each” may not help explain technical concepts

**Tools-acquisition stars! (when there is a purpose)**

# The Issue Isn't "Too Many Words" or "Reading from the Slide"



Electrical model  
of the AXL



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# Tools/Skills are Quickly Acquired When They Clearly Aid Problem Solving

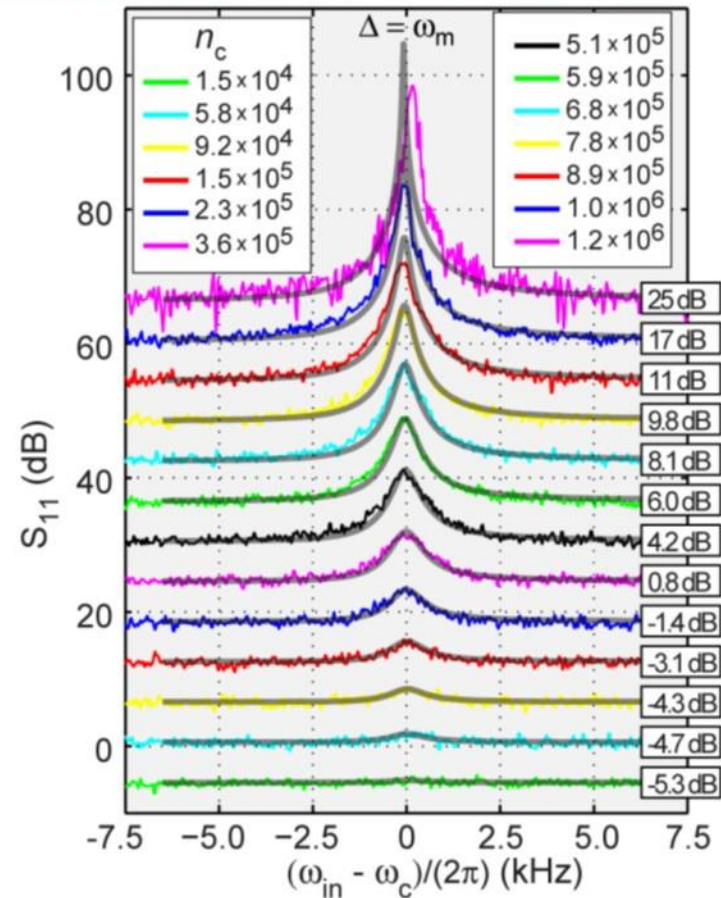
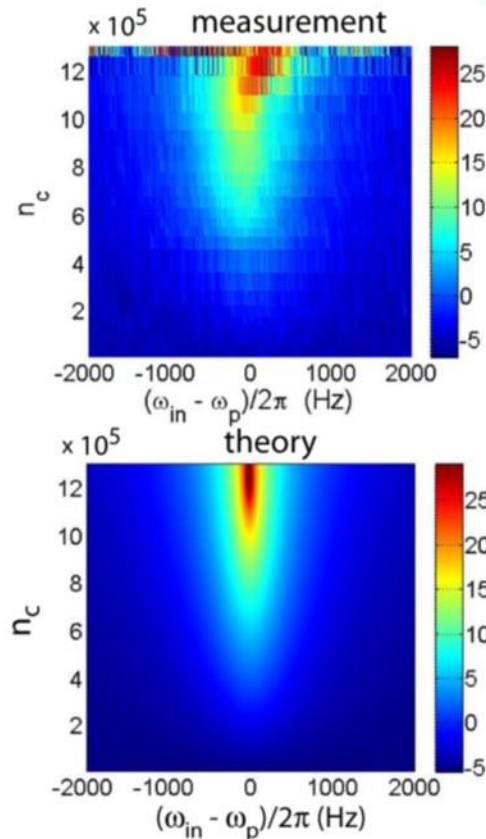
1. Identify the purpose for acquiring the new tools
  - Solve the audience's business-critical problems
2. Present relevant domain-knowledge
  - Provide examples that are immediately useful (font size, color, layout, etc.)
3. Practice new tools
4. Develop best-practices for their specific field
5. Continue development after the class
  - Internal: Peer support network and common “language”
  - Additional domain-knowledge references and resources
  - External: Other venues to view and present

Text	Red	Orange	Yellow	Green	Blue	Purple	Black
Dark Red	Dark Red	Dark Red	Dark Red	Dark Red	Dark Red	Dark Red	Dark Red
Red		Red	Red	Red	Red	Red	Red
Orange	Orange		Orange	Orange	Orange	Orange	Orange
Yellow	Yellow	Yellow		Yellow	Yellow	Yellow	Yellow
Lt Green	Lt Green	Lt Green	Lt Green	Lt Green	Lt Green	Lt Green	Lt Green
Green	Green	Green	Green		Green	Green	Green
Lt Blue	Lt Blue	Lt Blue	Lt Blue	Lt Blue	Lt Blue	Lt Blue	Lt Blue
Blue	Blue	Blue	Blue	Blue		Blue	Blue
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Purple	Purple	Purple	Purple	Purple	Purple		Purple
Black	Black	Black	Black	Black	Black	Black	



## Mechanical microwave amplification

- Only common fit parameter  $n_c$  (known within factor of 2)



# Engineering Explanations™: Guiding Principle

“Explain ideas so clearly,  
others can explain them”

# **LO3: Leverage Your Technical Talent's Hard Skills**

To Improve Their Soft Skills/Leadership Effectiveness

# Typical STEM Soft-skills Training Challenges

- Presentation skills
- Oral and written communication skills
- Leadership development
- Time and resource management
- Mentoring
- Others, ...

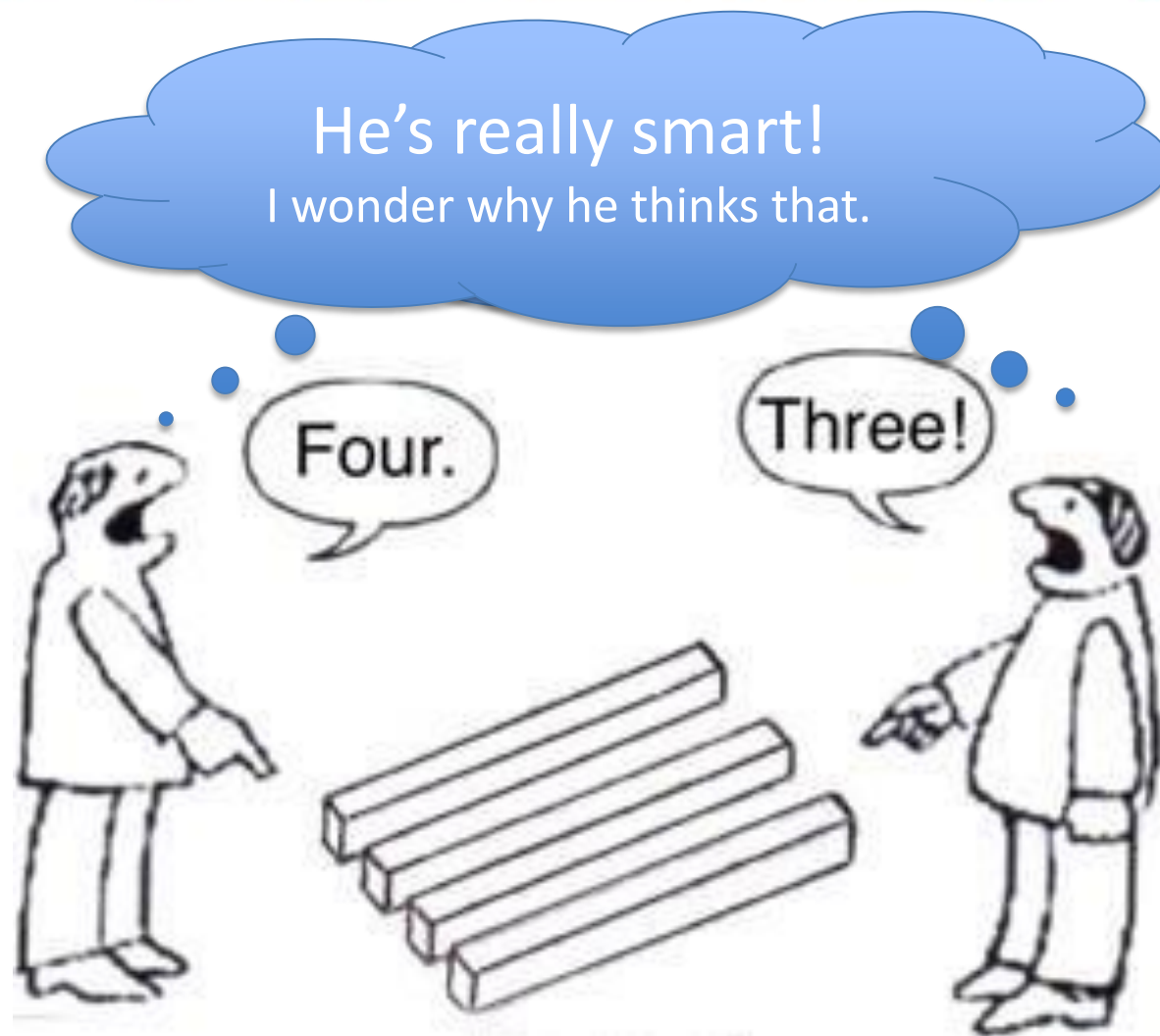


## Group Exercise: Think Like an Engineer

1. Form groups of 3-5 people
2. Discuss training activities that are not effective for your technical staff members
3. Imagine you are a “stereotypical engineer” doing one of the activities in Item 2
  - a) What do “you” like about the activity?
  - b) Does anything about the activity make “you” uncomfortable?
  - c) Would “you” **directly** use this activity on your job?
  - d) What work are “you” not getting done while “you” are doing this activity?
4. Discuss ways to improve the training activity by using the positive traits/skills of the “stereotypical engineer.”

# Learn from Each Other

- A few volunteers: Please tell us
  1. One training activity you want to improve
  2. Issues the “stereotypical engineer” has with that activity
  3. How you would improve the activity



Trainer

Technical Employee

# **Thank You! We'll Stay for Q&A. Feedback Counts!**

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Supplementary material and slides:

[www.ChannelScience.com/ATD2015.html](http://www.ChannelScience.com/ATD2015.html)

Name	Audience	Description
<i>e</i> <sup>x</sup> perience ACCELERATED™	Corporations, Agencies, Institutions	2-day class with group workshop exercises <b>Focus:</b> Technical leadership development for engineers and scientists
Engineering Explanations™	Corporations, Agencies, Institutions	2-day class with group workshop exercises <b>Focus:</b> Creating and presenting clear, confident, effective technical presentations
Hirable for Life™ Career Transition Workshop (unique and effective corporate outplacement support service)	Unemployed STEM workers; Those changing careers or industry	½ day class with group workshop exercises <b>Focus:</b> Rebuilding hirability, rapid career development, personal growth, outplacement support

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# Engineers and Scientists are Different

## Their training should be, as well!

1. Break through stereotypes
2. Find the positive traits behind them
3. Utilize these traits to customize training

Please visit us at **booth 309**

We'll be happy to share our best advice for your toughest STEM training challenges!

[www.ChannelScience.com/ATD2015.html](http://www.ChannelScience.com/ATD2015.html)