

Harvard and MIT-Style Innovation for the 21st-Century High School

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MIT is known for innovations.

Innovation is a synonym for creativity.

Can I take a “creativity class” like I would a calculus class?

No.

How is it possible that MIT is a leader in creativity when it doesn't even formally teach it?

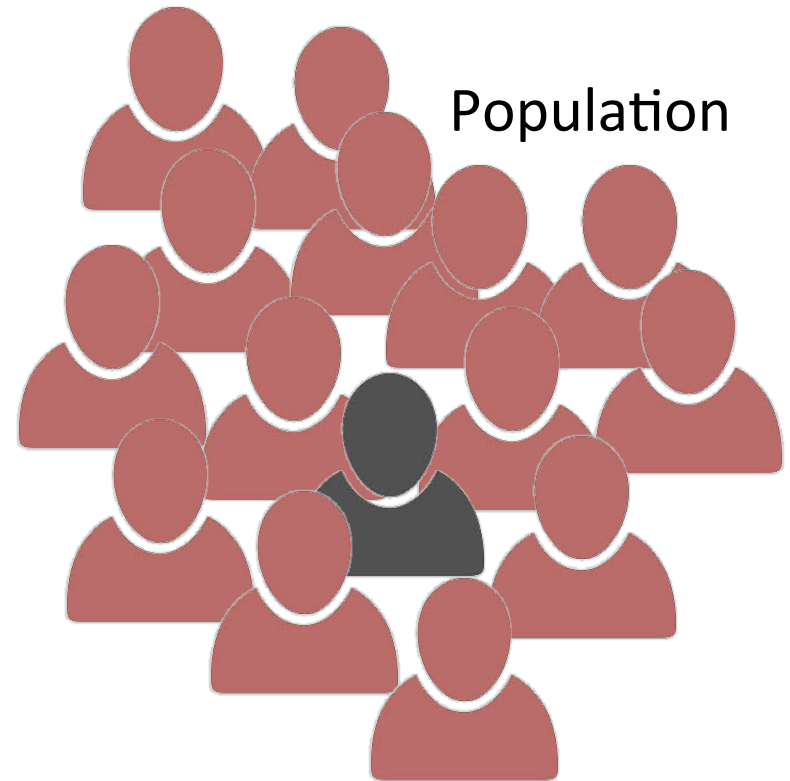
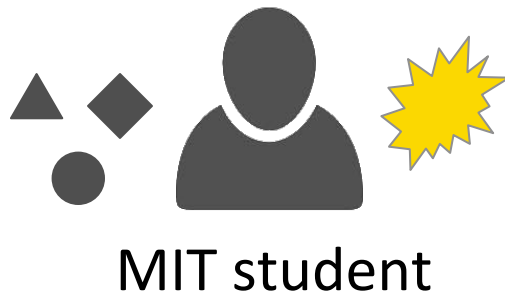
The MIT model:



Bright people
+
Hardworking
+
Challenging problems

A hit or miss proposition for creativity
but
MIT “hits” more often than its peers.

Does creativity have to be “hit or miss”?

Consider the following:



Is it possible to teach the MIT student so that whenever she creates , it's guaranteed that 99% of the population thinks  is creative?

Our initial intuition...

If we want a 99% success rate, we need to understand what people mean when they believe something is creative.



How the population perceives creativity:



What experts say creativity is:

Sir Ken Robinson, the most watched TED talk of all time: 29M views for “How Schools Kill Creativity”

“...process of having original ideas. But it’s having ideas that have value.”

Julie Burstein, Peabody Award-winning radio producer

something that “...grows from everyday experiences...”

Elizabeth Gilbert, author of “Eat, Pray, Love” ...

An experiment to define creativity:

MIT students were given 2 tasks.

Task 1: Imagine hearing a piece of music that you have never heard before. And, you absolutely love it.

Do you think the musician is creative? [Yes/No/Maybe]

Task 2: Write down the things you think music is made of. Then indicate if the musician invented any of those things.

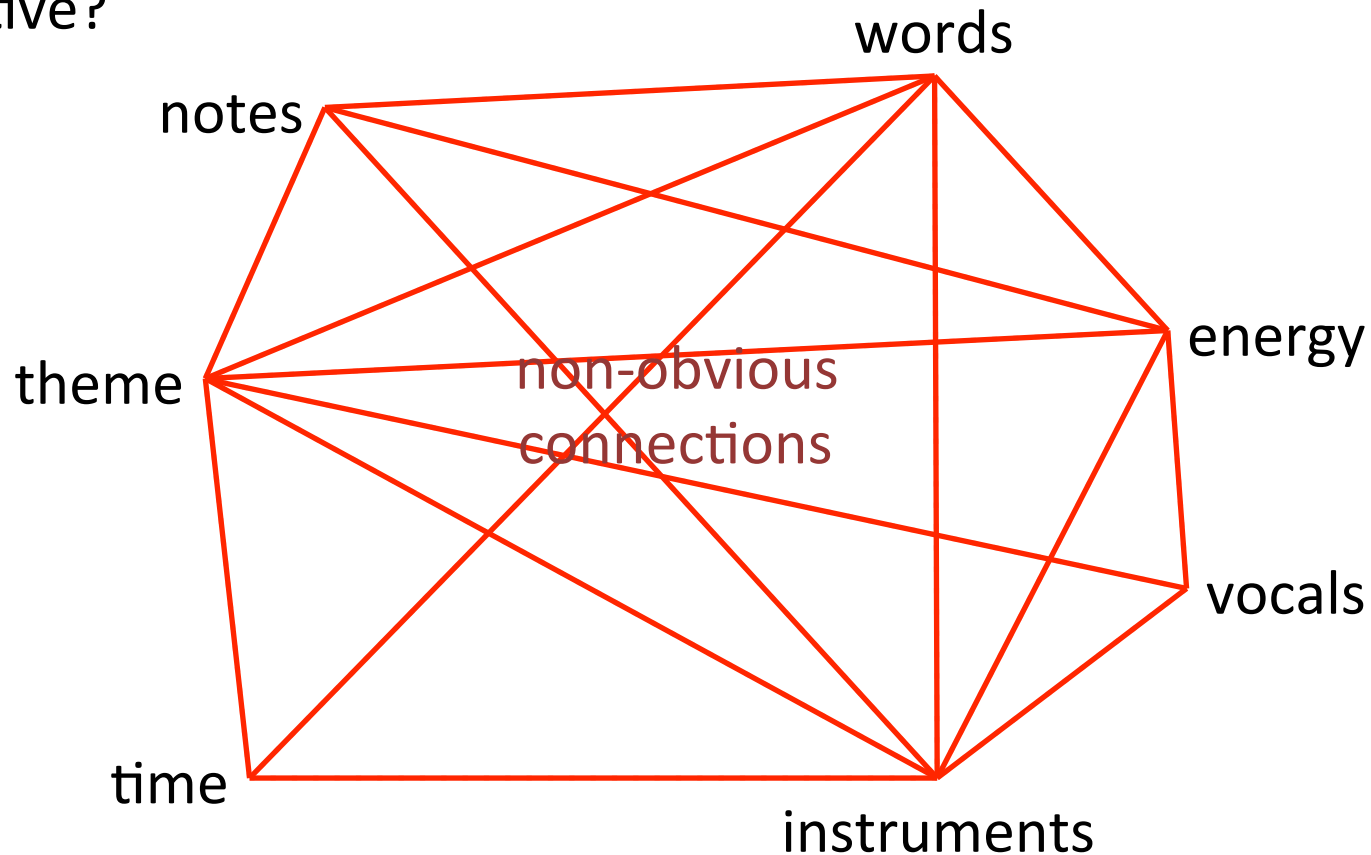
Results:

- Is the musician creative? 90% said “Yes”
- What makes up music?

~~time~~ ~~theme~~ ~~is~~
~~vocals~~
h ~~instruments~~
~~notes~~ ~~energy~~
~~words~~

What does the data say?

If the musician did not invent any of the components of music, what did he/she do that justified being thought of as being creative?



Creativity: ability to make non-obvious connections

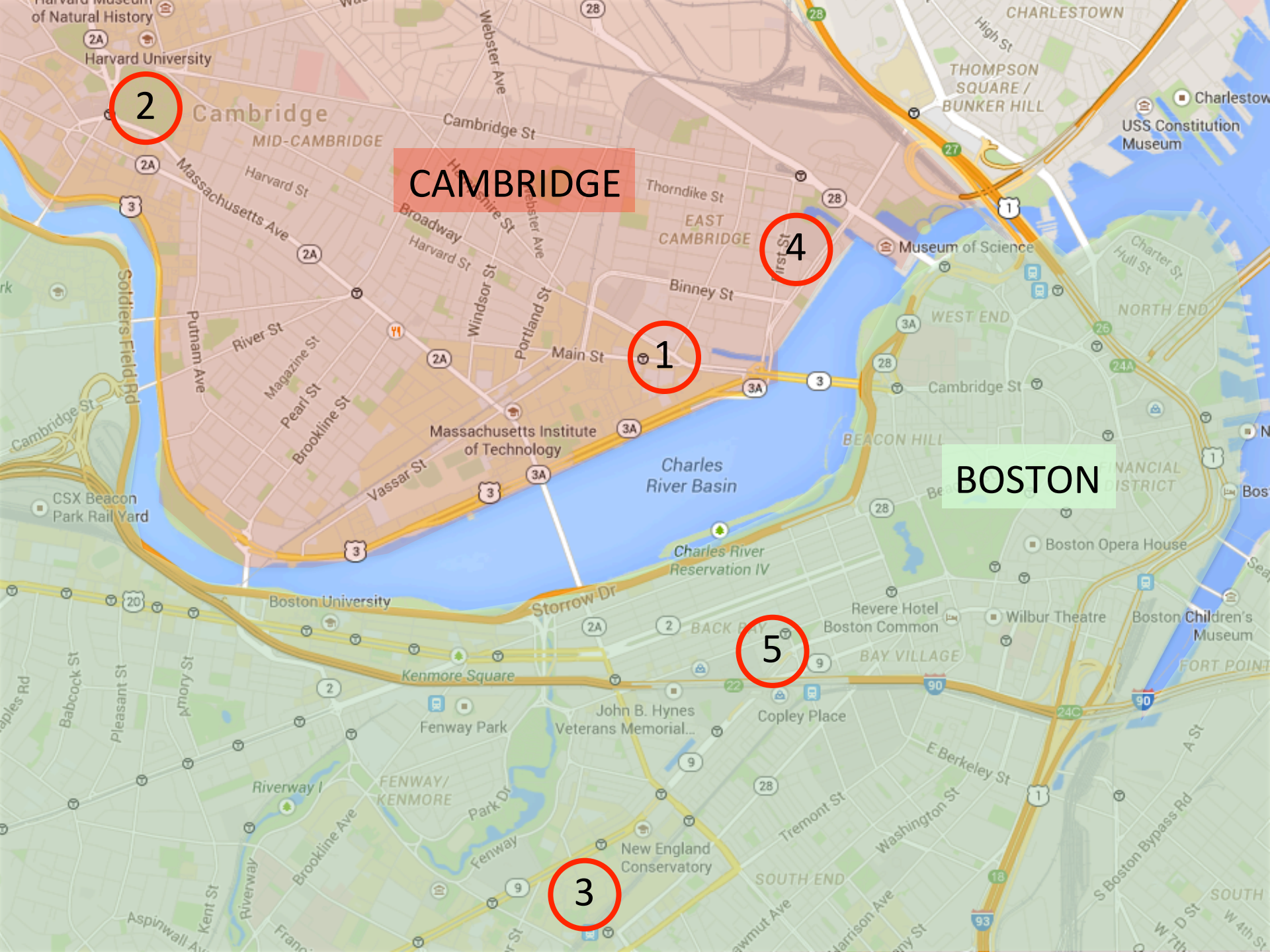
A “teachability” experiment:

Random people are given this problem:

- Draw a perfect circle
- No radial instruments (string, stick, compass, etc.)
- No tracing objects (tracing a round cup, etc.)
- No paper folding

Each attempt (not participant) is scored:

- Blinded scoring of the methods used by the participants
- Creativity scale from 1 to 5
 - 1: not creative
 - 5: very creative



CAMBRIDGE

BOSTON

2

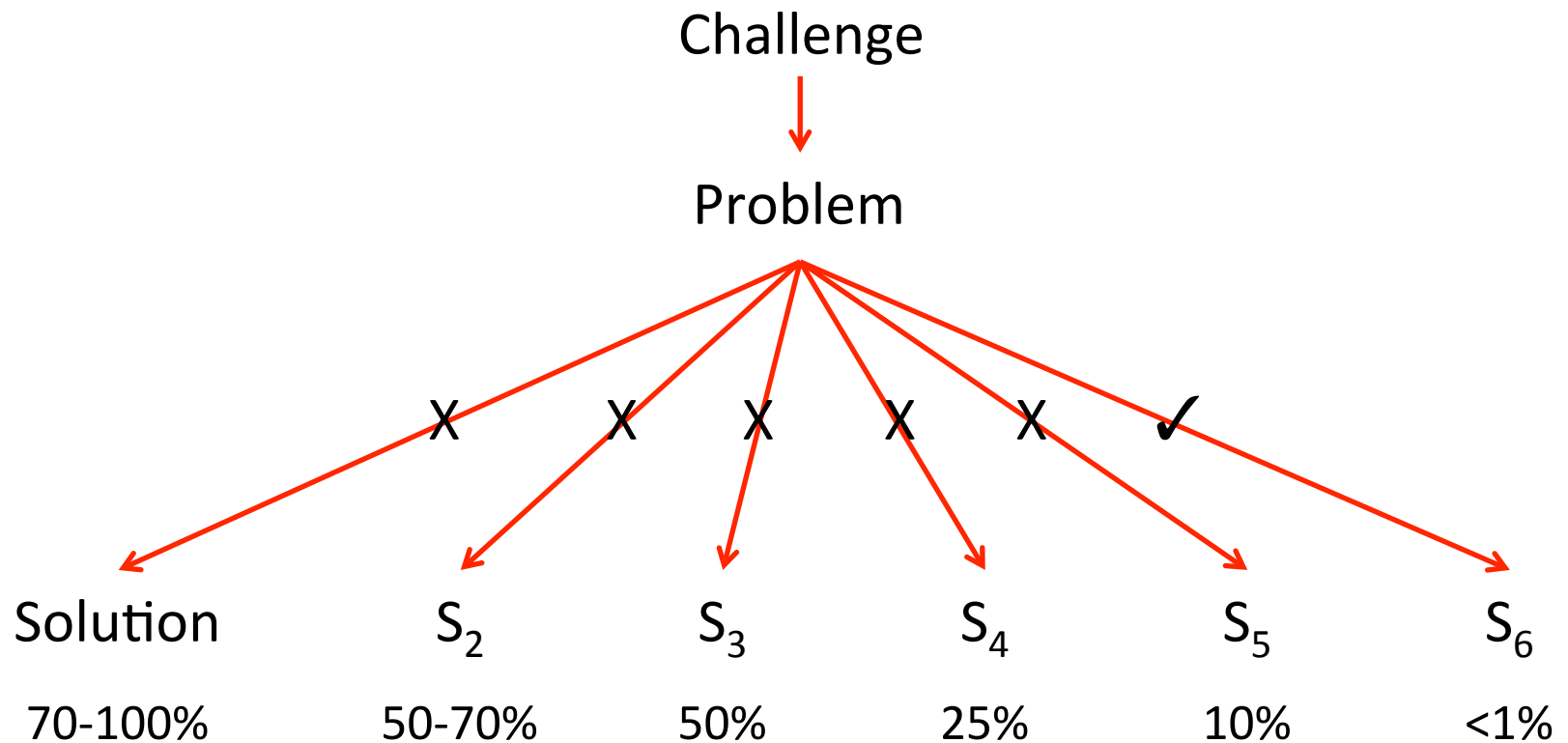
1

4

5

3

What did we learn? It's damn hard to draw a circle.



0

creativity score

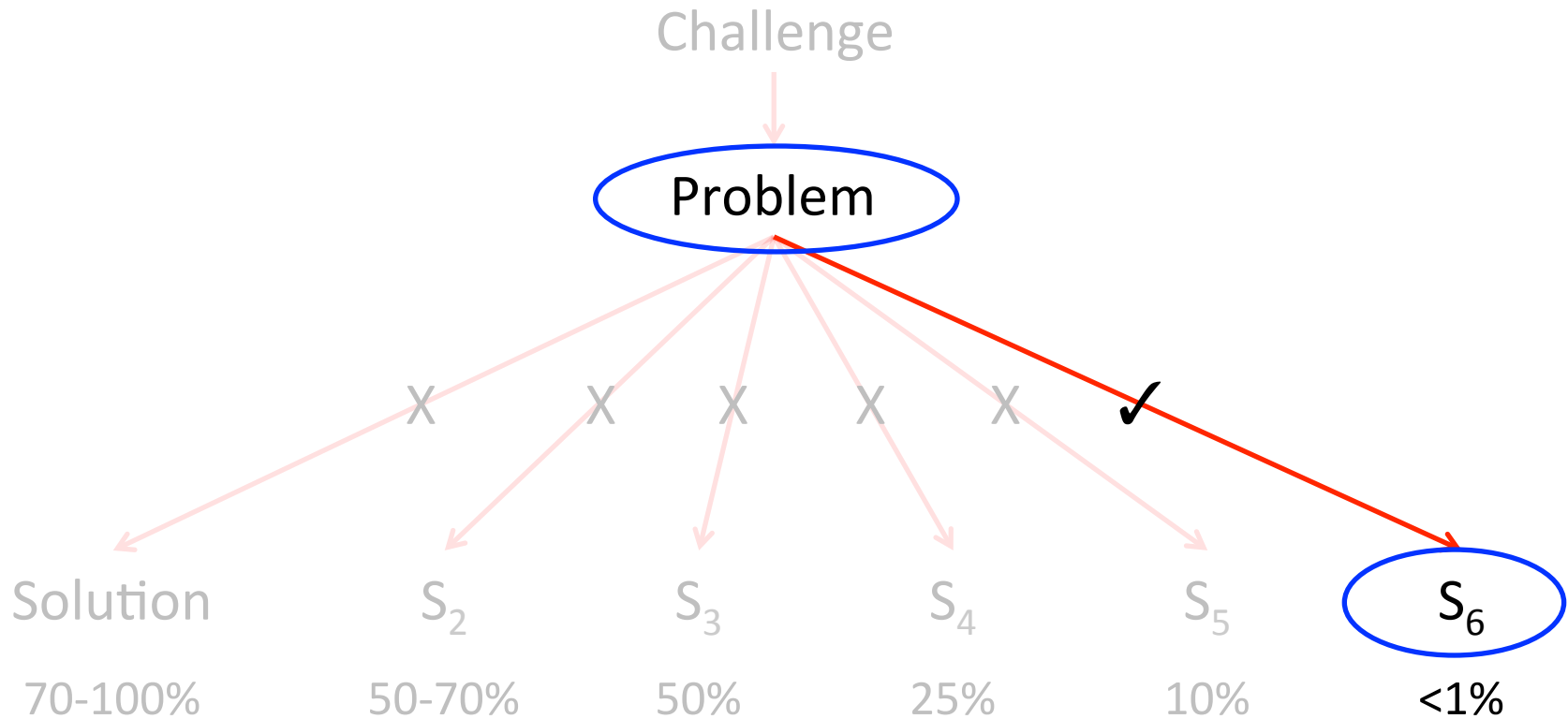
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obvious

non-obvious

Solutions that work after 6 or more trials are by definition...

A connection between a problem and a solution that is non-obvious to 99% of the population.



How to teach creativity:

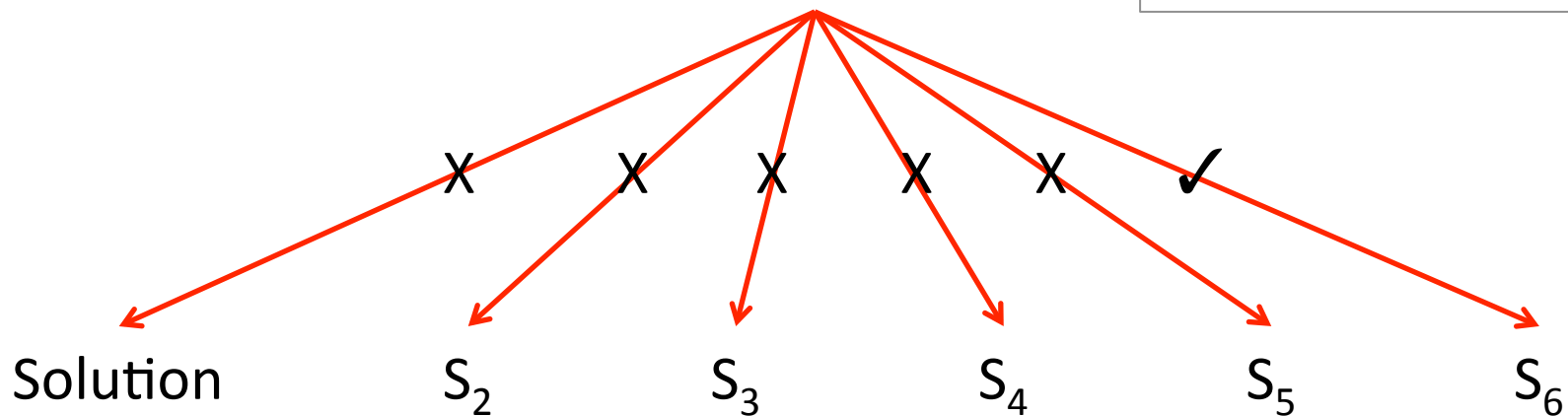
- Give students challenges
- Teach them how to create their own challenges

Challenge



Problem

- Show students problems
- Teach them to identify problems



- Encourage students to fail **often**
- **Reward them for failures** (iterations)

What's the most famous painting in the world?

Original



Copy



Angry Birds

How many attempts did they make?



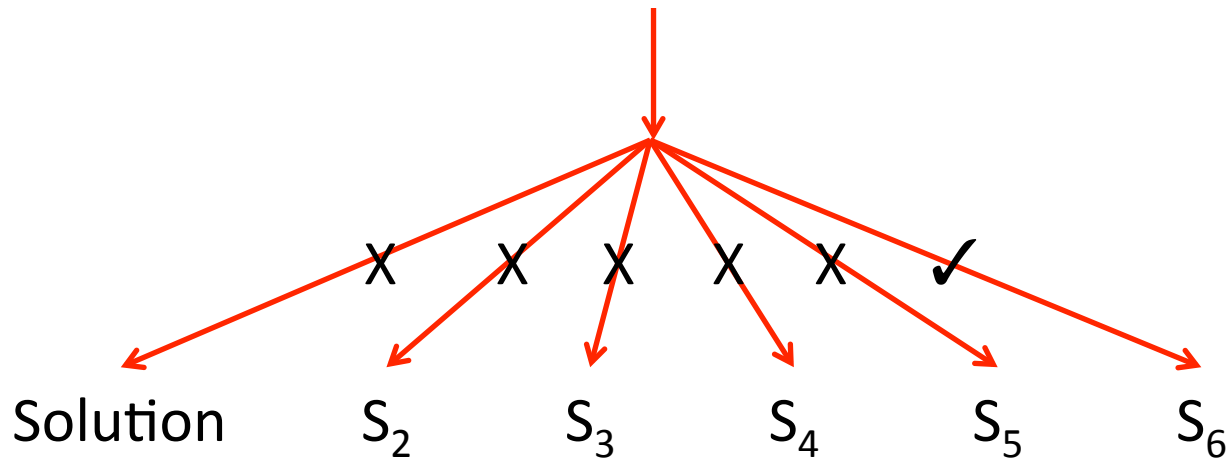
What next?

- We want to move this “teaching of creativity” to the high school level, beyond the walls of Harvard and MIT.
- We have created an organization called Innovators Only (innovatorsonly.org)

InnovatorsOnly.org

Professors
+
High Schools
+
Funding from local gov't, corp. sponsors, families

Students working on challenging problems



The most creative students get:

- Scholarships
- Invitations to do summer research with professors at:

Harvard MIT Boston University NYU
Johns Hopkins Rice Columbia Stanford
Carnegie Mellon Brown UCSD Princeton
Northeastern Berkeley Vanderbilt Tufts

Learn how high schools can participate at www.innovatoronly.org