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Dissecting Creativity: A view of innovation from an engineering design perspective

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A man with a red bandana and a woman are looking at a corkboard with many papers pinned to it. The man is in the foreground, wearing a red t-shirt, and the woman is behind him, wearing a white hoodie. They are in a room with a large screen on the left and a whiteboard on the right.

Brainstorming

Design by Analogy

Gallery

C-Sketch

TRIZ

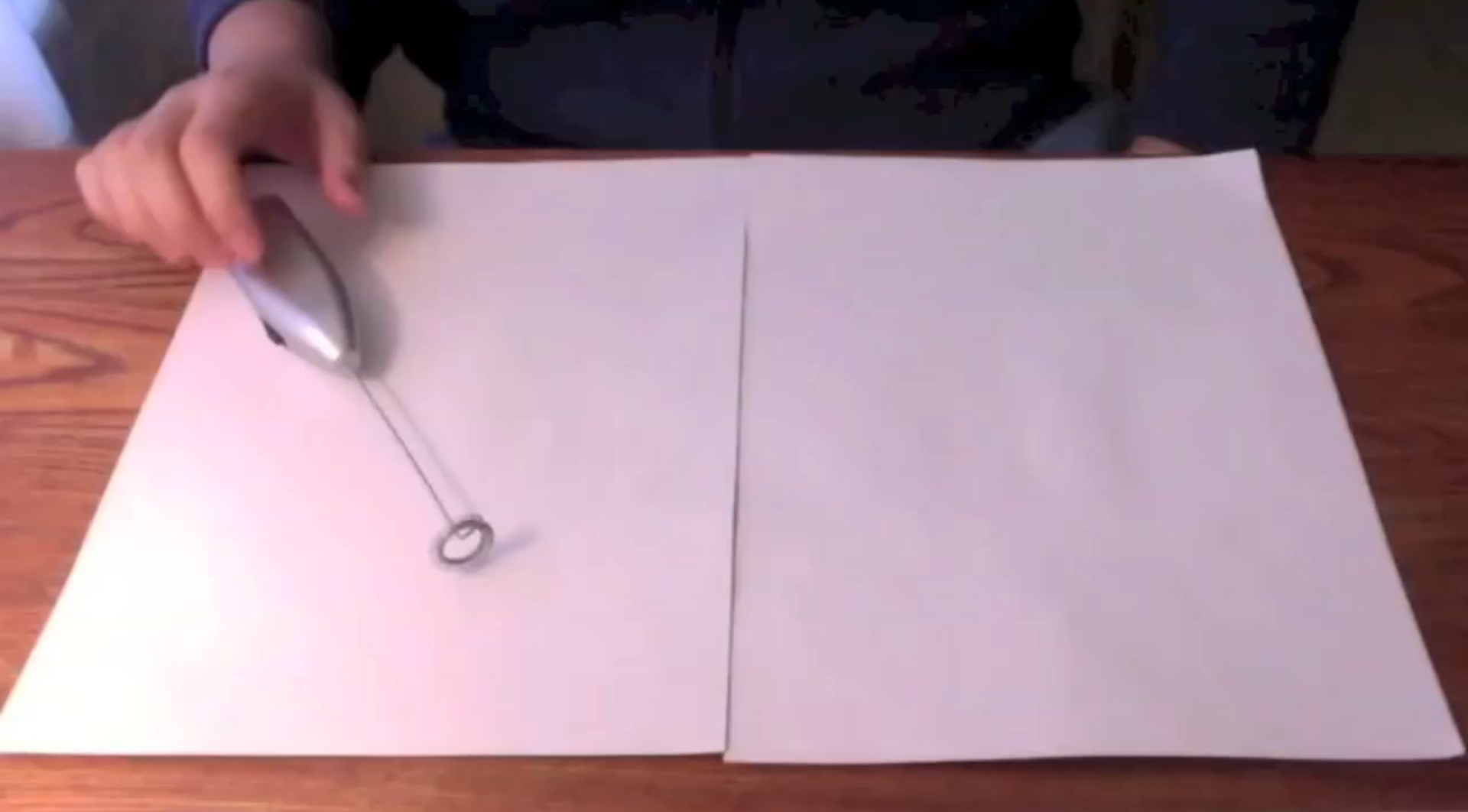
Engineering researchers have focused on developing methods for increasing creativity during idea generation

[Osborn 1971; Altshuller, 1985; Smith 1998; Kulkarni et al. 2012]



Design-by-analogy seeks to help designers identify and find examples to solve design problems

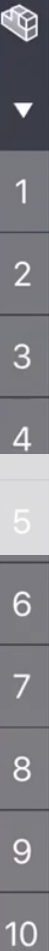
[Gentner 1983; Linsey et al. 2007; Moreno et al. 2014]



Product Dissection

... helps students understand the product and its properties

[Wood, 2001; Lamancusa & Gardner, 1999; Grantham et al., 2010]



Analogical Distance

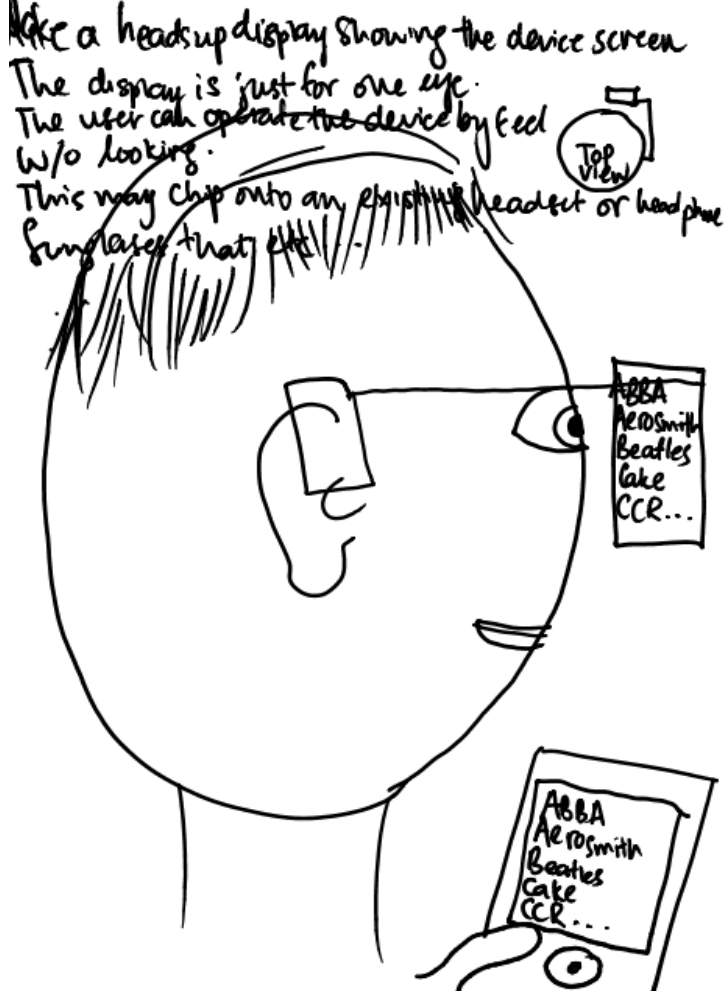
Product Complexity

Medium of Dissection

Virtual Product Dissection provides new opportunities for analogical transfer

[Wood, 2001; Lamancusa & Gardner, 1999; Grantham et al., 2010]





People have an inadvertent bias against creativity due to the risk associated with endorsing a novel idea

[Kleiman, 2008; Charness & Grieco, 2013]

There is a lack of knowledge about the underlying factors that can impact design decision making

**PERSONAL BIAS AND
COGNITIVE STYLE**

**CREATIVE CONFIDENCE
AND MOTIVATION**

**SOCIAL EFFECTS AND
THE ENVIRONMENT**



What factors lead to individuals and teams abandoning creative ideas?

- Risk tolerance in the financial domain relates to risk taking in a creative domain
- Team personality characteristics significantly predict the likelihood of creative concept selection.
- People are more likely to exhibit ownership bias when their ideas are of less quality





<http://tasc.engr.psu.edu/>



Tool for Assessing Semantic Creativity

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EVALUATING DESIGN IDEAS WITH TASC IS AS SIMPLE AS 1-2-3



STEP 1: UPLOAD CONCEPTS

Select the ideas to be evaluated and upload them into a tasc poll. You have control over who sees the images.



STEP 2: DISTRIBUTE POLL

Share your tasc poll with whoever you want to evaluate the designs: your design team, client or potential customers



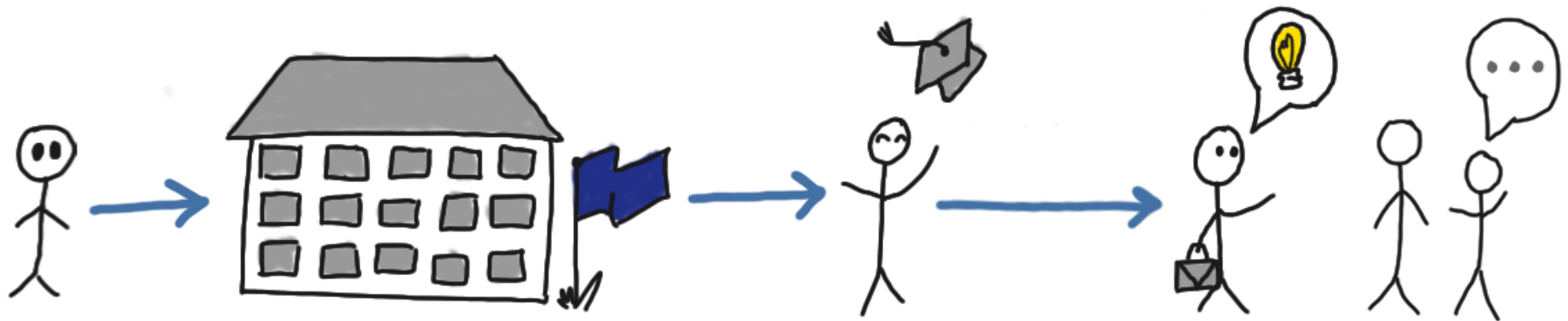
STEP 3: VIEW RESULTS

See the creativity ratings of your ideas as well as the words that were used to describe your concepts.

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We use our results to modify the way that we train innovative potential in our engineering students.



Design Methods



Individuals



Interventions



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