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A Study of Product Dissection's Impact on Engineering Creativity

Christine A. Toh

University of Nebraska at Omaha, ctoh@unomaha.edu

Scarlett Miller

Penn State, scarlettmiller@psu.edu

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A Study of Product Dissection's Impact on Engineering Creativity

Christine Toh and Dr. Scarlett Miller

Background and Motivation

Designers typically interact with products during the early stages of design to gain an understanding of the solution space. However, few studies have been conducted to understand how these practices affect idea generation which thereby limits our understanding of the utility of these methods. Therefore, the current study was conducted to understand designer-product interactions in order to develop recommendations for their use during the design process.



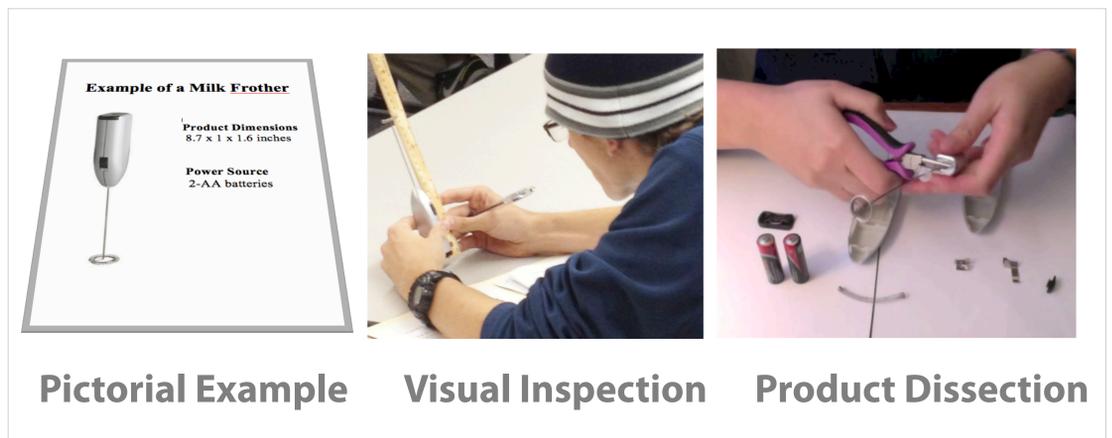
89 first year engineering students were provided with a design challenge and asked to complete one of three design activities

Experimental Design and Methodology

The Design Challenge

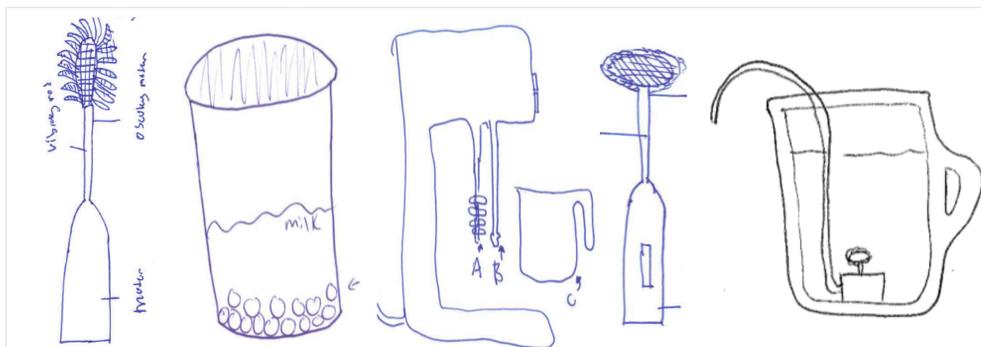


The Three Experimental Design Activities



Results and Conclusion

Rating the Design Ideas



718 concepts sketches were developed by participants

2 independent raters judged each concept and attained an inter-rater reliability of 94%

4 creativity metrics were calculated from these ratings:

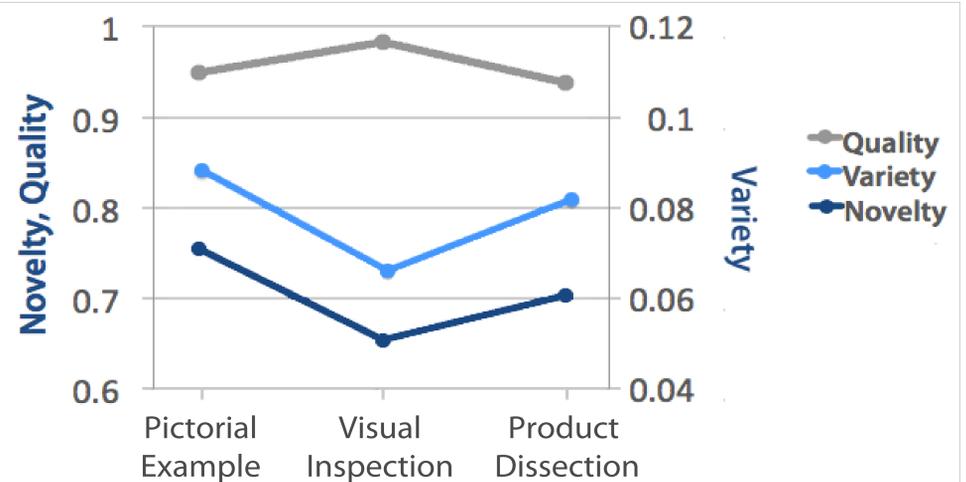
Variety: range of solution space explored

Novelty: originality of the solution

Quality: the quality of the solution

Quantity: number of solutions generated

Findings



- Product dissection and pictorial examples encourage novel thinking and 'opens up' the solution space compared to visual inspection.
- Visual inspection encourages the development of higher quality ideas.
- Physical designer-product interactions limit creativity.

Conclusion

While visual inspection and product dissection help designers understand the solution space, they limit design creativity. Thus, future studies are needed that focus on the development of new physical product interaction methods to reduce their negative impact on creativity.