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The Impact of Virtual Dissection on Engineering Student Learning and Self-Efficacy

Christine A. Toh

University of Nebraska at Omaha, ctoh@unomaha.edu

Connor Disco

Scarlett Miller

Penn State, scarlettmiller@psu.edu

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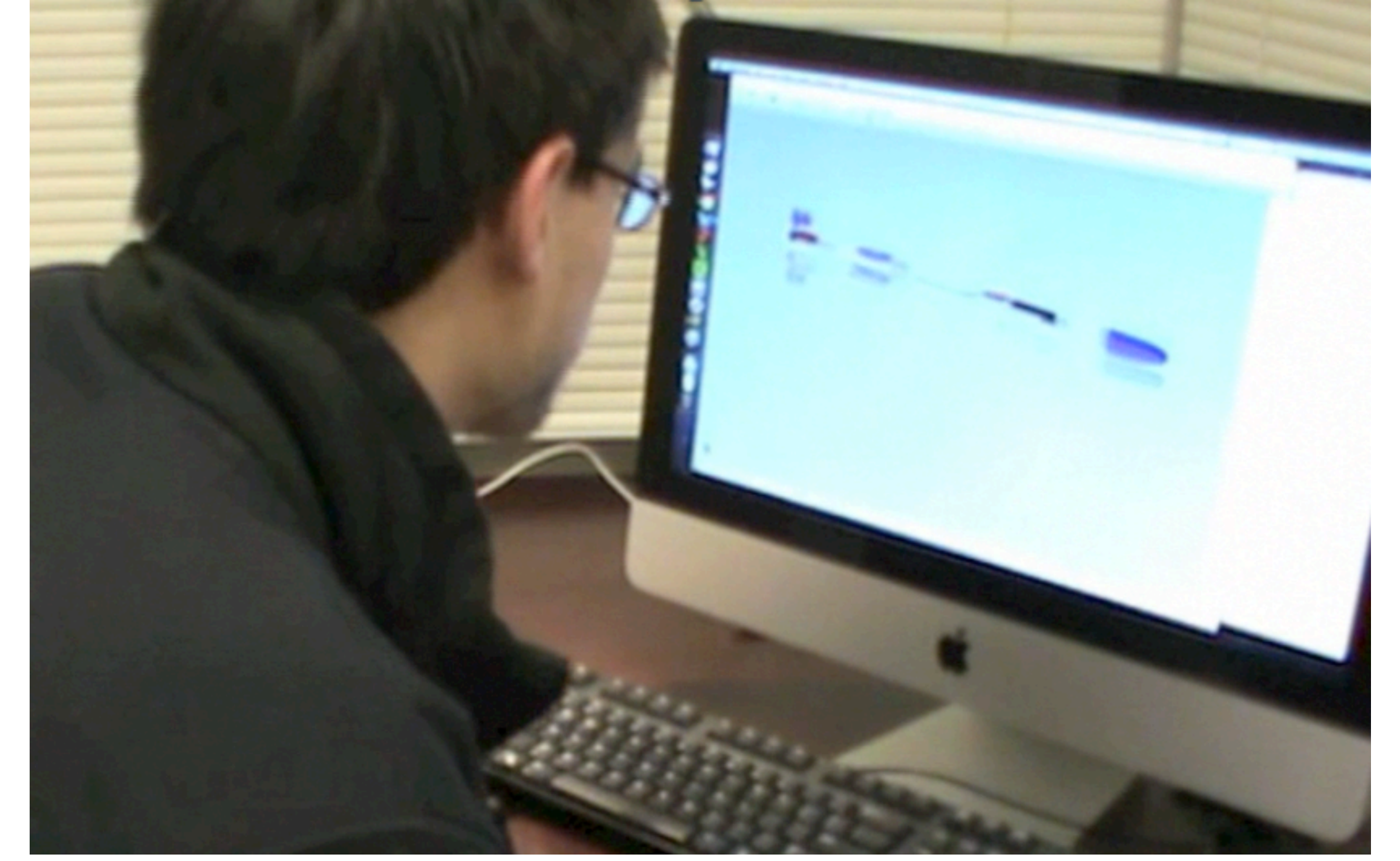
The Impact of Virtual Dissection on Engineering Student Learning and Self-Efficacy

Christine Toh, Connor Disco, & Dr. Scarlett Miller

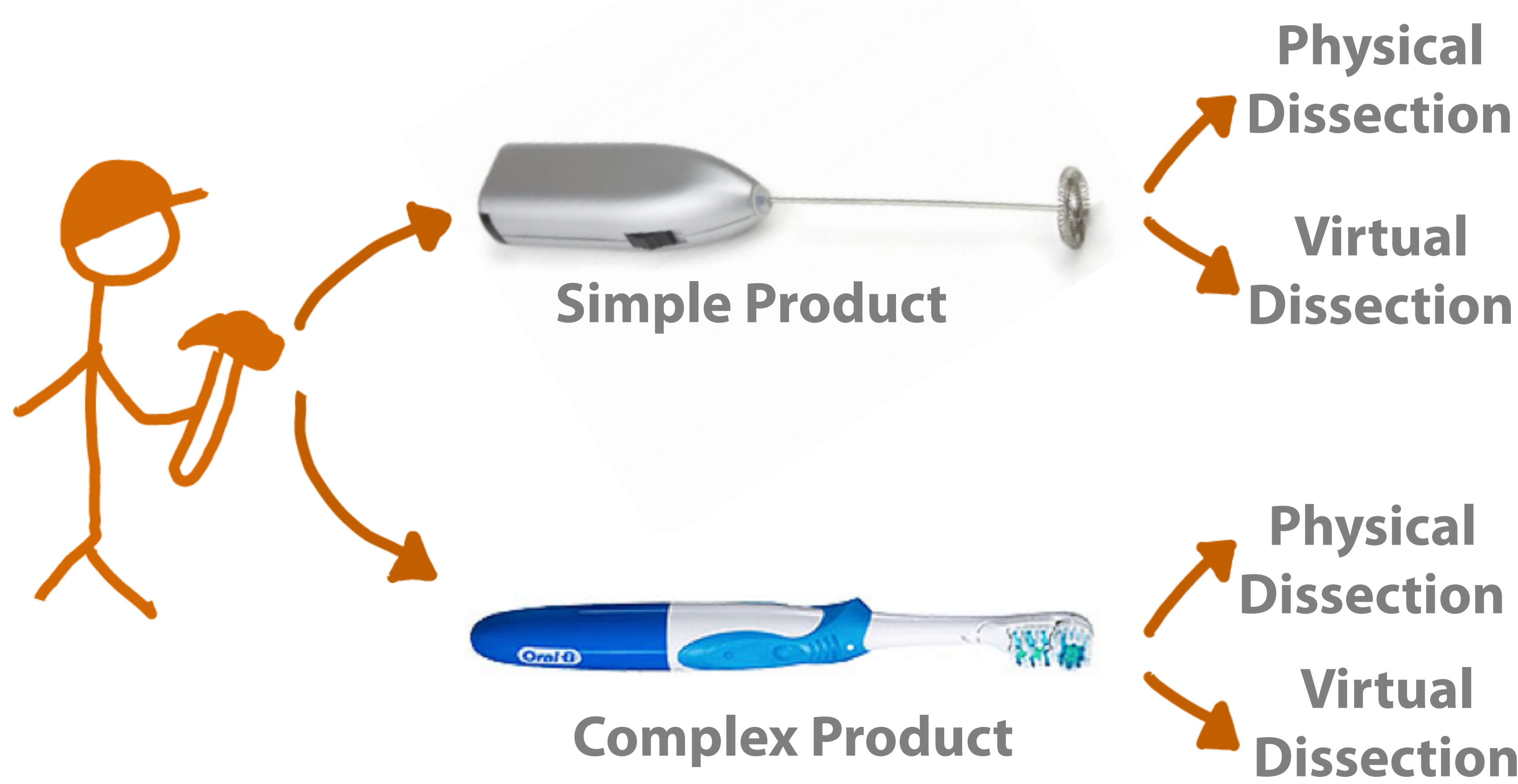


Background and Motivation

Product dissection activities are widely practiced in engineering education and recent efforts have sought to develop and **utilize virtual dissection** tools, little data exists on how these tools impact the learning process. Therefore, this study investigates the impact of virtual dissection on student learning and self-efficacy to understand the effects of virtual dissection tools for enhancing engineering instruction.

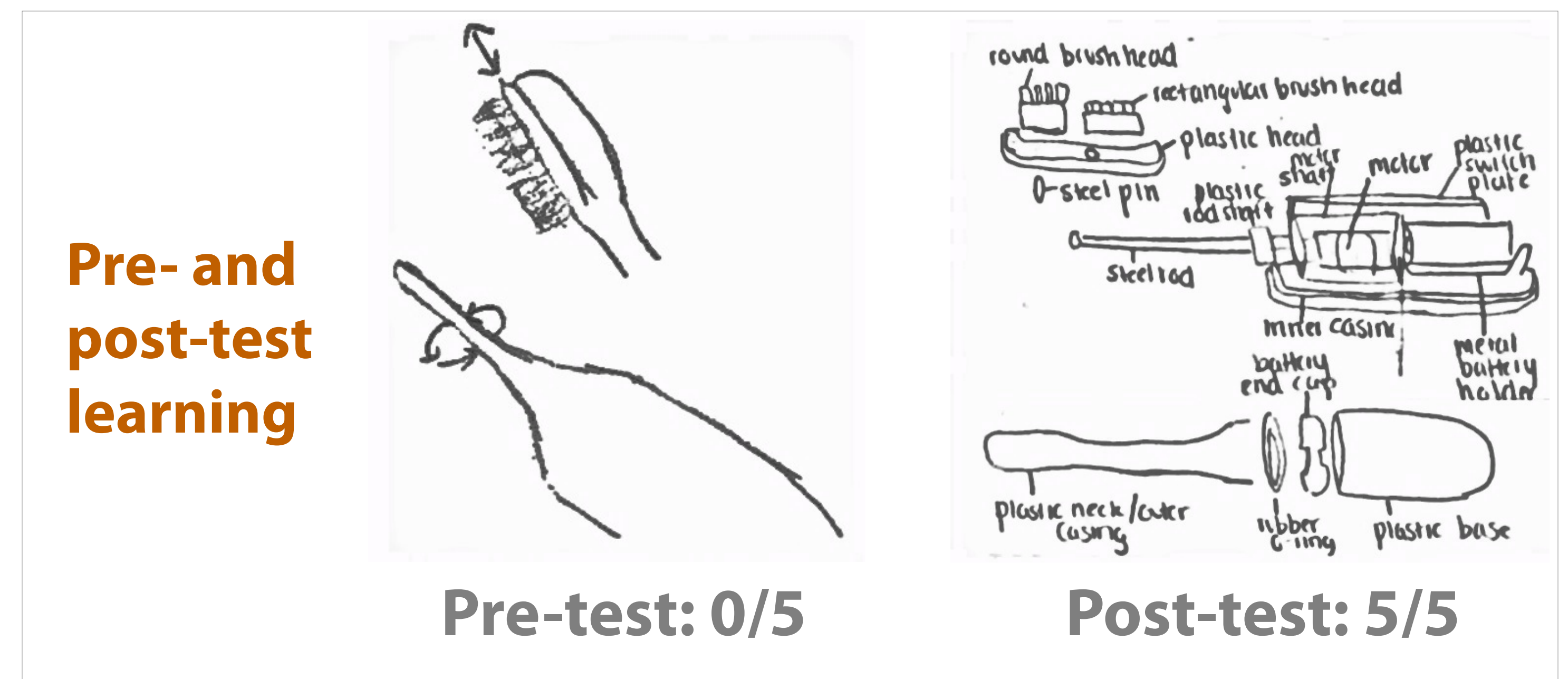


20 first year engineering students were assessed for learning and self-efficacy before and after a **dissection activity**, consisting of 4 conditions.



Experimental Design and Methodology

Two independent raters judged the **pre- and post-test student learning assessment results**

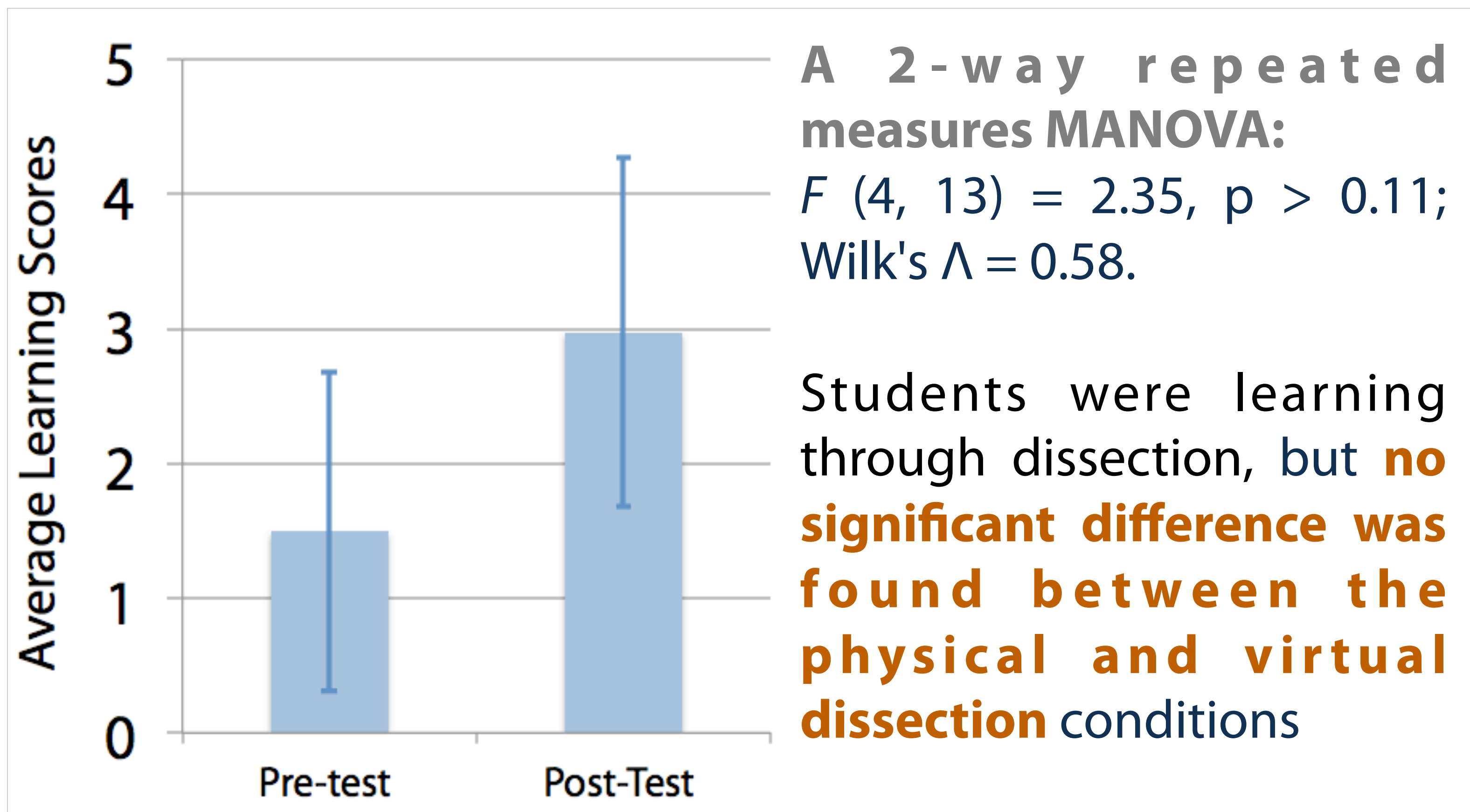


Pre- and post-test self-efficacy

"Rate your confidence (0 to 100) in your ability to take apart an electro-mechanical device without damaging the internal structures"

Results and Conclusion

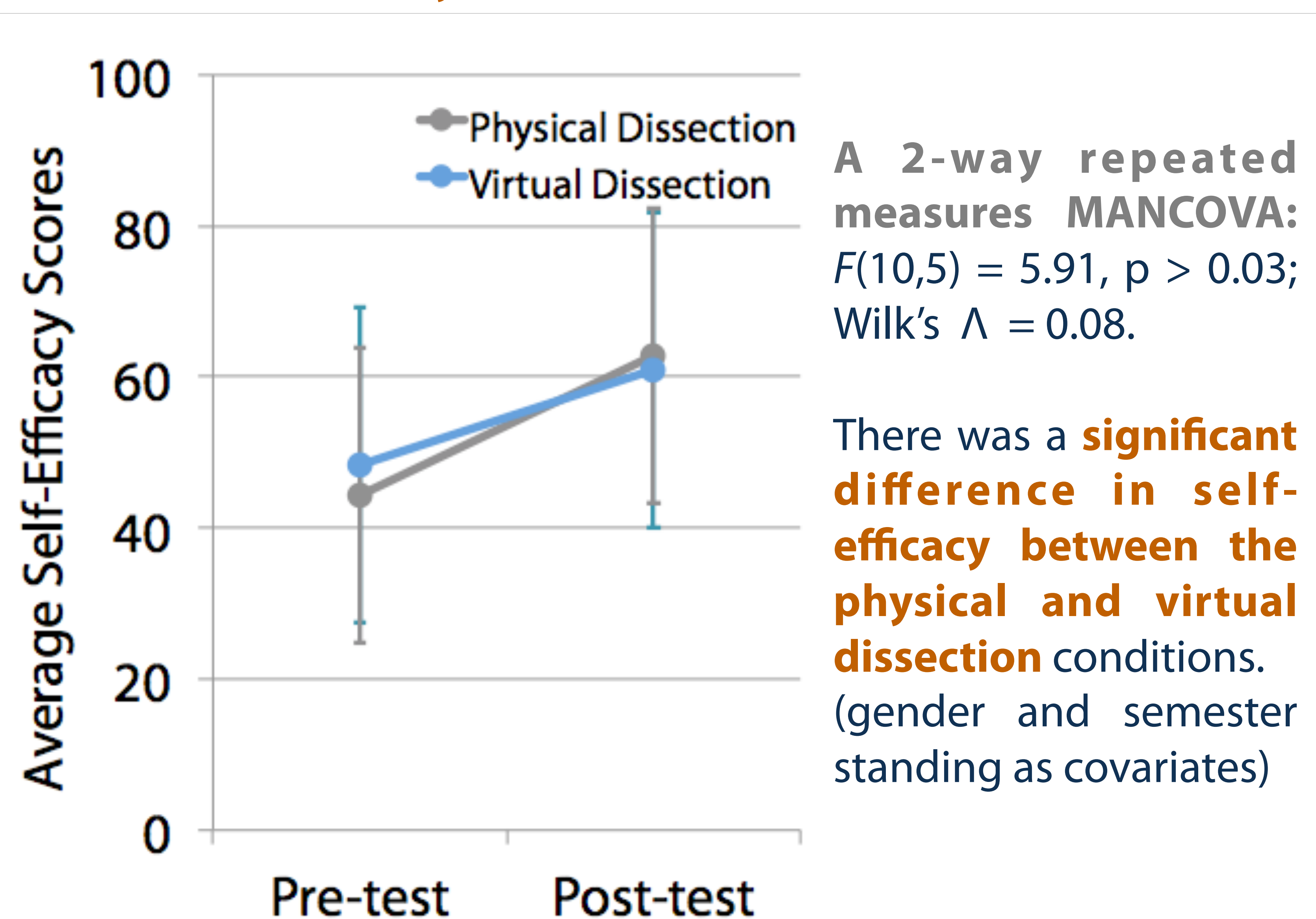
Student Learning



Conclusion

Virtual dissection results in the same student learning as physical dissection, but increases in self-efficacy are reduced in students who perform virtual dissection. Future research should focus on the development of more interactive virtual dissection interfaces in order to refine and enhance virtual dissection environments in engineering education.

Student Self-Efficacy Gains



- Physical dissection results in **greater self-efficacy gains** in engineering students compared to virtual dissection.
- Gender and semester** standing play a role in self-efficacy gains from dissection activities.