Tactile Trigonometry: Improving Student Success with 3D-Printed Manipulatives

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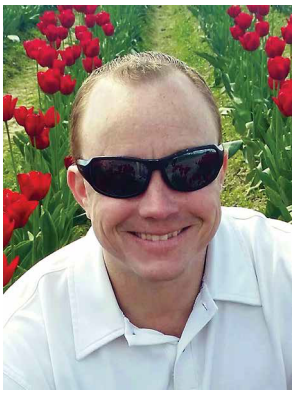
Abstract:

Trigonometry can often be a tough class for many students. Recent work during the first year of an NSF grant (DRL 1623405) has shown that Precalculus II classes using 3D-printed manipulatives and active learning guides score significantly better on exam scores than Precalculus II classes exposed to interactive lecture techniques. Handouts were designed to guide students through active learning lessons using objects generated using 3D-printing technology. By leveraging this new technology, students were able to utilize group work and a hands-on approach to practice trigonometry during the learning process, rather than being exposed to more common interactive lecture techniques. Gains of up to 20% in exam success rates were achieved by using 3D-active learning methods over lecture methods.



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