

Using 3D Printed Teaching Pass-Arounds for Mechanical Design Courses

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Abstract Improving engineering students' spatial-visualization skills continues to be a focal point in solid mechanics instruction. Inexpensive additive-manufacturing (three-dimensional printers) allows faculty to create tools that address diverse learning styles, especially visual and kinesthetic learners. The ability for an engineering instructor to transform a creative idea into an immediate physical learning aid is a transformative educational tool. Inexpensive 3D printing has unleashed instructor creativity in solid mechanics. This paper presents five different solid mechanics and mechanical design teaching aids that were rapidly conceived, designed, printed, and implemented within two semesters of acquiring a dedicated instructor 3D printer. The tools generated enhanced student learning and helped them build connections between what's on paper and real objects. There is considerable potential for instructor creativity while developing innovative solutions quickly. This paper demonstrates the example ideas with the purpose of inspiring fellow faculty to improved and build upon them. These teaching tools and more like them can be printed with inexpensive printers making them accessible everyone.