

Envisioning the future by looking into the past: Development of biomolecular visualization resources by the NSF-funded BioMolViz community

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BioMolViz is a community of practice dedicated to improving biomolecular visualization instruction. Guided by a framework of learning objectives for biomolecular visualization skills, our initial project goal was to create a repository of validated assessments to evaluate students' visual literacy. In 2018, the team was awarded one year of seed funding, which led to a four-year National Science Foundation (NSF) grant. This support allowed BioMolViz to flourish into a community of educators in professional development workshops and working groups, where teams of participants aimed to design effective and accessible assessments to evaluate students' biomolecular visual literacy. As the project advanced, we piloted these items in classrooms across the United States. Through a small-scale classroom testing study, we compared student and instructor perceptions of assessment difficulty, while large-scale testing revealed performance patterns that reinforced the need to understand distinct student perspectives. This led us to evaluate students' problem-solving strategies through surveys and semi-structured interviews. Based on this work, we argue that a reimagining of the curriculum can begin with faculty but must include productive student partnerships to enact effective change. We offer our repository of visual literacy assessments, the BioMolViz Library, as an instructor resource shaped by the student perspective, and present a new instructor training resource recently produced by our working group. As we approach the close of our funding cycle, we offer our ideas and invite conversations on fostering long-term sustainability for our robust community of practice, under all future resource models.