The Voicethread discussion board was used in combination with tutorials created by JING to supplement learning of spectroscopy in a large enrollment organic chemistry laboratory course. Voicethread is proposed as an effective tool for the teaching and learning of spectroscopy, because it is visually based and allows students to communicate while synthesizing multiple pieces of visual information. Both technologies were implemented on a large scale and their effectiveness was assessed using analytics, surveys, exam results, and a specially designed pre/post term knowledge probe. Data was collected for participating and nonparticipating students for comparison.

- Analytics indicate that students visited the Voicethread site and JING tutorials repeatedly throughout the term, especially prior to exams.
- >300 students surveyed rated both Voicethread and the JING tutorial as more useful study resources than the course text.
- Graduate student instructors indicated that students whof used the methods engaged in discussion of spectroscopy earlier and more often than students who didn't.
- Graduate student instructors indicated a greater sense of community among students in their lab sections.
- Participating students showed a marked difference in their written explanations of their problem solving process over nonparticipating students.
- The course instructor was able to view individual comments and responses to spectroscopy problems, illustrating muddy points and misconceptions which could be later addressed in lecture.

This work was developed through the MELO3D (Michigan Education through Learning Objects) project, which is an award winning initiative that supports teaching with technology at the University of Michigan. Participation in this cross-disciplinary group was invaluable to the work presented here. An incredible variety of technology is available for application in education and improvements in technology are occurring at a rapid rate. Therefore it is overwhelming for an individual to assess what technology is appropriate. Though the MELO3D group we were able to identify technology (Voicethread) which is uniquely suited for the project.