Interactive Lecture Demonstrations (ILDs)

Instructional Sequence:
1. Set Up
2. Think
3. Pair
4. Share
5. Commit
6. See It
7. Agree
8. Transfer
(adapted from Sokoloff & Thornton 1997, 2004)

Example: Blackbody Spectra
- Students shown a blackbody spectrum at one temperature
- Students predict at a new temperature
- Materials for students and instructor guide both through the content and ILD steps

Materials
We have developed six interactive lecture demonstrations (ILDs) for ASTRO 101 as per the method successfully implemented in the context of physics teaching (Sokoloff & Thornton, 1997, Sokoloff & Thornton, 2004). These ILDs make extensive use of educational computer simulations. For each ILD, both a preliminary classroom-ready student worksheet, and an instructor’s guide have been developed.

Study
We are implementing a pilot study to explore their effectiveness in communicating scientific content, and the extent to which they might enhance students’ knowledge of and perception about astronomy and science in general. The study design uses a pre-/post-test quasi-experimental study design measuring students’ normalized gain scores, calculated as per Hake (1998) and Prather (2009), using a slightly modified version of S. Slater’s (2011) Test Of Astronomy STandards TOAST combined with other instruments.

Motivation
- Students do not learn as well from lecture (e.g., Hake 1998)
- Many K-12 teachers adopting active learning
- ASTRO 101 still predominantly taught via lecture
- Many ASTRO 101 instructors willing to try active pedagogy, but don’t know how.
- Physics instructors can use tangible demos in the classroom to “spice things up”, but this is more difficult in astronomy.

Final goal
- Student workbook with response sheets
- Instructor guide with links, tips, etc.
- All materials available free on request

More information and references available at http://physics.uwyo.edu/~aschwartz/

Funding provided by Wyoming NSF EPSCoR WWISE program and NSF Grant EPS # 1208909.
Leave of absence support by Quinsigamond Community College, Worcester MA.