Interactive Lecture Demonstrations: An Effective Active Learning Strategy for Lecture

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The results of physics education research and the availability of computer-based tools have led to the development of active learning materials to improve conceptual learning in the introductory physics course. These include hands-on, student-centered laboratory curricula like *Real Time Physics (RTP)* [1], and lecture materials like *Interactive Lecture Demonstrations (ILDs)* [2], [3]. The success of these materials is based on (1) engagement of students in the learning process, and (2) clear and understandable presentation of real observations of the physical world. Student learning assessment using conceptual evaluations has played a large role in the development and validation of these approaches. *ILDs* in most areas of physics have been published by John Wiley and Sons in the book, *Interactive Lecture Demonstrations* [4]. Examples of *ILDs* in different areas of physics, and the eight-step *ILD* procedure will be demonstrated through audience participation. Uses of *ILDs* to create an active learning environment, and results of studies on the effectiveness of *ILDs* will also be presented.

1. David R. Sokoloff, Ronald K. Thornton and Priscilla W. Laws, "*Real Time Physics: Active Learning Labs* Transforming the Introductory Laboratory," *Eur. J. of Phys.*, **28** (2007), S83-S94.
2. David R. Sokoloff and Ronald K. Thornton, "Using *Interactive Lecture Demonstrations* to Create an Active Learning Environment," *The Physics Teacher* **35:** 6, 340 (1997).
3. David R. Sokoloff, "Active Learning of Introductory Light and Optics," *Phys. Teach.* **54**: 1, 18 (2016).
4. David R. Sokoloff and Ronald K. Thornton, *Interactive Lecture demonstrations* (Hoboken, NJ, John Wiley and Sons, 2004)