

## Comprehensive Flipped Learning Pedagogy via Decoding and Just-in-Time Teaching

The participants in this workshop will develop templates for pre-instruction assignments, in-class activities and post-instruction closure and assessment modules. These will be comprehensive, integrated modules in the spirit of Flipped Learning (Hamdan 2013.) Flipped Learning is an inductive pedagogy scheme, guiding the student through a considerable amount of independent work in preparation for the lesson and post-lesson assessment, thus freeing the class time for instructor led discussion, clarification and extension.

A particular lesson development process starts with identifying the commonly encountered bottlenecks and constructing pedagogically sound techniques of addressing these. This procedure, developed by David Pace and Joan Middendorf, is known as the decoding cycle (Pace, 2004) and provides the foundation for learning activities. Following the Just-in-Time Teaching paradigm (Novak, 1999, Simkins, 2010), pre-class assignments are then prepared to help students become aware of these bottlenecks and attempt to deal with them. To illustrate the real world connection of the upcoming lesson, worked-examples of solutions to relevant problems, as developed by an expert on the subject, are presented for the student to analyze and self-explain (Chi, 1989.) This is the essence of the flipping of both the timing and the nature of the student work. The student does some preliminary work before the formal lesson and the application precedes the theory. Anticipating student responses to the, usually web-based, pre-class assignment, the instructor then prepares a rough outline of the in-class activities, which include discussion of actual student responses, mini-lectures, demos, short videos, clicker-based discussion and small-group peer to peer conversations. Education research has demonstrated the efficacy of breaking up the fifty minute lesson time into this kind of variety of small segments (Deslauriers, 2011.) We have done a considerable amount of work developing modules from pre-class worked-examples, interactive video and JiTT to in-class (e.g.clicker-based) activities to matching post-class and formative assessment material to close the feedback loop and will share these with the workshop participants.

[http://134.68.135.20/ISSOTL15\\_JiTT/](http://134.68.135.20/ISSOTL15_JiTT/)

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