Instructional Design Techniques You Can Bring into the Classroom

What do we know about the way people learn?

Cognitive Research

- Suggests the learning mechanism is pretty clunky.
- We have short-term memory buffers, where we hold information while we're trying to integrate it with long-term memory structures (schema).
- But short-term buffers are really small. We can hold perhaps 3-5 items at a time (Cowan, 2001).
- There's a big contrast between learning capacity (via short-term memory) and the capacity to know and to apply complex knowledge (via long-term memory).
- Schema in long-term memory can be huge and extraordinarily sophisticated. No known upper limit to schema size in the human brain.
- Schema are also instantly available – they don't have to be routed through conscious thought.
- Example – recent study on typing (Snyder, Ashitaka, Shimada, Ulrich, & Logan, 2014):
    - A spectacular skill, when you think about it.
    - So sophisticated that none of us learn it quickly.
    - Participants had average typing speed of 72 words a minute.
    - But, given a keyboard page with letters missing, could place only 15 of the letters.
- We can access these sophisticated mental schema without even thinking about it.
- But building it is the tough part – clunky short-term memory makes it a slow, continuous process.
- For learning, slow-and-steady wins the race.
- If you can get students to attend to information / problems / activities repeatedly, they will gradually build bigger and more sophisticated schema in long-term memory.

Active Learning

- Students learn successfully when they engage in activities – discussing, solving problems, writing, completing assignments.
- They learn by doing things and thinking about the things they are doing.
- Social Learning Theory (Bandura) fits in here – key to learning is participating in communities of practice.

What this Research Suggests

- Broadly, engagement is the key – repetitive engagement whatever it is we're trying to learn.
- And people are key – learning happens in a social context.

Applying in the Classroom

So, how do you get students to attend, again and again, to learning tasks?

- Use a variety.
- Do lots of them.
    - They benefit a lot from numerous short activities/assignments.
    - Can certainly do medium or long ones too, as they build their knowledge base, but it's best to do these *in addition to* short ones rather than *in place* of them.
- The segmenting principle. Break learning tasks into small pieces. Let students move from one kind of activity to another.
- There are lots of different active learning tasks you can use:
    - Active Learning Activities (North Dakota State University).
    - Active Learning Activities (University of Waterloo).
    - Active Learning / Student Engagement (Coastal Carolina).
- Do some in class.
- Send them home with some.
- Class time = guaranteed follow-through.
- Assignments sent home = likely follow-through, if they are graded.

Enhancing with Technology

- You don't need to use the technology (LMS, Blackboard) for this.
- But it does these things well, and it's great at presenting multiple assignments on a timed schedule, collecting student submissions, and facilitating your grading.
- A number of faculty use Blackboard to supplement their in-class teaching.
- Often as a repository for the syllabus, readings, videos, etc.
- But it really shines as a learning support if you use it actively:
    - Quizzes
    - Discussions
    - Problems to solve
    - Short-answer written assignments
    - Case studies
    - Journals
    - Blogs
- Also consider using it to "flip" some aspects of your class – i.e., to do the informational parts, such as lectures, outside the classroom … leaving more time for activities in the classroom.