Unit 2 – Pedagogy Strand

Progression of Teaching with Technology & Interdisciplinary Computing

The pedagogy strand of Unit 2 covers two largely independent ideas. First, we will think about a progression of confidence in using technology for instruction, and how failure does or does not play a role in that progression for you. Second, you will think about how to infuse computing into other subjects in a typical school setting.

Progressing as a Teacher Using Instructional Technology

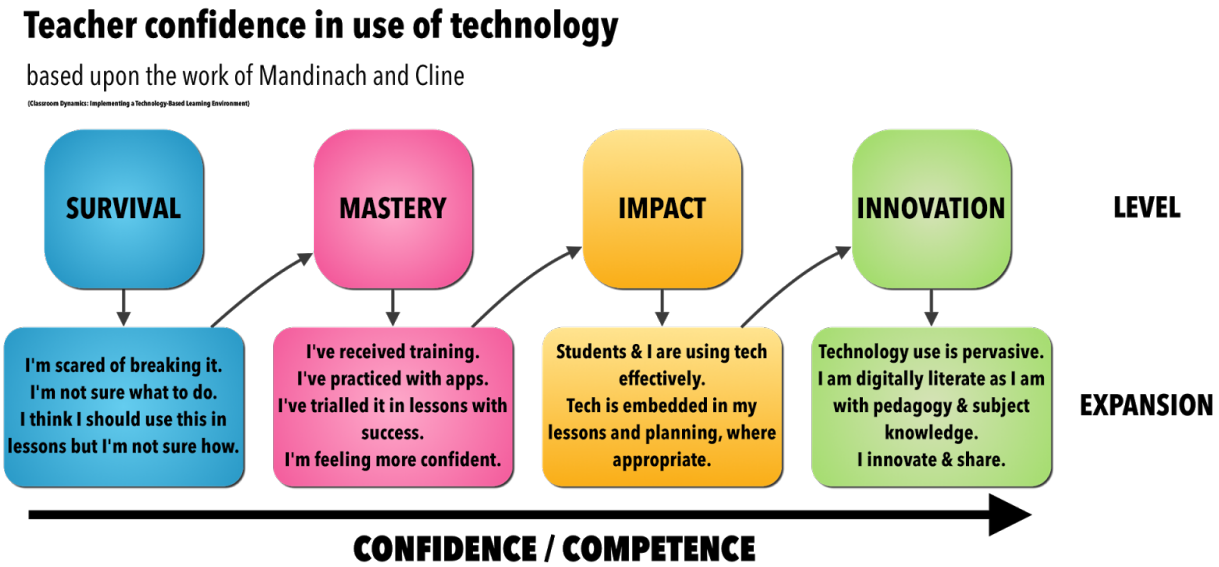

Image 1 - from http://ictevangelist.com/teacher-confidence-using-technology/, via ookas http://www.educatorstechnology.com/2014/01/interesting-flow-chart-on-teacher.html

In Unit 1, you thought about your teaching with respect to two progressive pedagogical models, and two ways of instantiating those models. Here in Unit 2, we ask you to think about your comfort in teaching with technology. This will be a theme we investigate further in Unit 5 of this course, where we will think explicitly about best practices for teaching with technology.

Here, however, we ask you where you are now, on one possible trajectory of teacher comfort with instructional technology, and how you can progress along that trajectory, if you wish to do so. However, we also recognize that there will likely be a range of confidence levels present among the teachers participating in this course.

Failure, and Comfort with It

From the blog post by Med Kharbach:

> "Technology use in the classroom is more a matter of mindset than know-how. Teachers with a growth mindset tend to embrace, explore, and discover the techy world more confidently than others. This is because these folks embrace failure and mistakes and instead of giving it a chance to inhibit their learning progress they capitalize on it for

the betterment of their teaching. They are usually seeking help from their tech savvy colleagues and sometimes from their knowledgeable students."

We'll look in more detail at how teachers facilitate learning in Unit 3, as we consider the role of the teacher in the (technology-using) classroom, but we want to especially draw out this passage on failure, and that "these folks embrace failure and mistakes… and capitalize on it for the betterment of their teaching." We might even paraphrase it and change "their teaching" to "their demonstration of learning."

Below, the readings list that includes two readings, and a blog post with three videos with thoughts about failure, and its role in learning how to succeed. Computing, in particular, is a field that is constantly evolving, and which is, in a word, impossible to be completely on top of. In other words, most computing teachers will, and should fail, and even fail in front of their students. The trick is to show students how to fail productively - being sure to call out failures not as problems, but as opportunities for learning. This then gives students the permission to try, even when success is not certain. Once they have this permission, they will try, they may fail, but they will certainly learn.

Interdisciplinary Computing

Computing is infused in every aspect of modern American society, for better and worse. Why then, do we try to teach so many things without considering technology and computing as part of them? Further, it is unlikely that there will be more hours in a school day - computing will either happen along with existing material or at the expense of that other material - which will we choose? One attempt at infusing computational thinking in other classes is described in number 4 below. What would it take to infuse computing/computer science into another course in your school?

Readings/Videos

1. Teaching to Fail - Edward Burger
2. Failure is an Option: Helping Students Learn from Mistakes - John Orlando
3. TED Talks in the Classroom: The Great Power of Failure (optional)
    - Quote from Regina Dugan's TED talk (video one at the link above): "I'm not encouraging failure, I'm discouraging the fear of failure." If you only have time to watch part of video these, start at around 16:00 minutes of video 1 (Regina Dugan).
4. Infusing Computational Thinking into the Middle- and High-school Curriculum (Skim this)
    - Abstract:
      In recent years there have been significant efforts to revamp undergraduate and K-12 curricula to emphasize computational thinking, a term popularized by Jeannette Wing in 2006. We describe work introducing and enhancing computational thinking activities and assessments in the middle- and high-school curriculum at the University of Chicago Lab Schools. In total six courses were altered as a part of the Computational Thinking across the Curriculum Project: middle-school and high-school computer science, and high-school Latin, graphic arts, English, and history. We detail the modifications to the curriculum and discuss the successes and challenges of the project.

Reflection Questions

Think about the following:

1) Where would you place yourself on the flow-chart shown above? Why?
2) How can you help yourself, or a colleague, move along that flowchart intentionally?
3) What role does failure play in your classroom, your school? Is it as accepted as you wish it might be?
4) Do you currently teach computing along with any other disciplines? If so, please describe how you do so. If not, describe how you could personally, or how you could collaborate with someone else in your school to do so.

Additional Issues to Consider:

1) Why failure, isn't this antithetical to what we want to teach our young learners? What can we do to help celebrate failure?
2) What is the hardest part of developing a computing infused curriculum? Is it worth it?
3) Do you see these two themes (confidence + failure AND curriculum infusion) as connected in any way? If so, how?
4) What was the most surprising part of this set of materials? What do you want to know more about?