CLASSROOM STRATEGIES

And Using it for Research Studies

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My Ideal

- Learn from the best
- Create classes you'd like to attend
- Active teaching, active learning

- Entertaining + Interesting + Relevant + Informative + Clear

Advice #1: Craft your courses.

- Don't "plan" a class. Craft it. Be intentional about every part of it. Assess it.
- Use resources:
  - Center for Teaching and Learning
  - Good Books (Understanding by Design)
  - Good Teachers at your institution
- Publish!

Understanding By Design by McTighe and Wiggins, 1998.

Advice #2: Have FUN.

- Set a tone of fun, engagement, & participation with your actions, your syllabus, and your words – from day one!
- It's okay for students to be wrong
- It's okay for you to be wrong or for you to say, "I don't know". Relax.

- "Everything I Needed to Know About Teaching I Learned in Kindergarten: Bringing Elementary Education Techniques to Undergraduate Computer Science Classes." Shannon Pollard and Robert C. Duvall. Proceedings of the 37th Technical Symposium on Computer Science Education, 2006.

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Advice #3: Active Teaching is More than Flipped Classrooms.

- Play games
- Play with toys
- Act it out
- Tell a story

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Toys in Computer Class

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Games in Computer Class

- Fun – They can be cooperative OR competitive
- They motivate students not motivated by grades
- Use a variety of prizes – candy, points, toys, stickers
- You can celebrate non-technical students (prize for most creative project)
- YOU CAN MAKE THEM EASILY

(Goal + Arbitrary obstacle = Game)

Reality is Broken, Jane McGonigal, 2011.

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Stories in Computer Class

Stories

"Computer Science Fairy Tales." Shannon Duvall. *Journal for Computing Sciences in Colleges*, 2008.

Playing in Computer Class

Kinesthetic Learning
- Act it out
- Makes abstract concepts concrete

Examples
- Be a hashtable, binary search tree, linked list
- Sort yourselves by birthday using quicksort

”Kinesthetic Learning in the Classroom." Begel, Garcia, Wolfman. SIGCSE, 2004.

Advice #4: Spontaneous Playfulness Saves the Day

- Story: The Annoying Student

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Advice #5: Find your mantras

- Story: Avoiding the Crickets

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Advice #6: Decide What You Care About

- Story: Discrete Math Homework Sucks

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Advice #7: Tell Stories

- Story: Fermat's Last Theorem
  - Putting It All Together:
    - Decide what's important
    - Crafting a Teachable Moment
    - (Kinda) Spontaneous Playfulness
    - Storytelling
    - Led to a new mantra

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PIERRE DE FERMAT

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ARITHMETICA

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$a^n+b^n = c^n$

“I have discovered a truly remarkable proof which this margin is too small to contain.”

Scholarship of Teaching & Learning

- Attend SIGCSE and CCSC
- You already know how to do research – read papers, emulate the good ones
- Anecdotes are good
- Experience Reports / Tool Presentation
- IRB:
  - Exemption
  - Control groups
  - Informed Consent

https://tinyurl.com/duvallrib

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Be Practical

- Don’t change too much in one semester
- Give yourself a break
- Enlarge your comfort zone
  (rather than working outside it.)
- Set the tone on Day One

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The Big Picture

Reflect often.

What makes a successful semester?

What makes teaching worth it for you?

What do students say about you and your classes?

What will people say when you retire?

“The main thing is to keep the main thing the main thing.”

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