

Slide 1



Hello, and thank you for joining us for this introduction to UF's Active Learning Initiative. My name is Jennifer Smith and I am the Director of the Office of Faculty Development and Teaching Excellence (FDTE). The Active Learning Initiative is jointly sponsored by FDTE, and UFIT's Classroom Support and IT Training. Mark McCallister supports UF's Learning Spaces and Ashley Weser coordinates training activities.

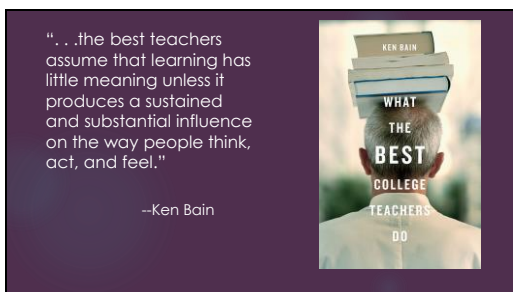
Slide 2



The Active Learning Initiative launched last summer. It's an informal group that got together periodically to talk about teaching strategies as well as space design. We talked about starting out small with one or two activities in existing spaces as well as more ambitious full course design projects and making use of specially designed spaces. This session is intended to kick-off these discussions for the coming year.

As we go through this presentation, I invite you to consider what would help you to incorporate more active learning types of assignments and activities in your course.

Slide 3



I think we would all like our students to really learn the course material. And generally, that means more than answering questions correctly on an exam. We want them to be able to reach inside and make use of what they have learned when they need it. We're looking for ways that students can incorporate their learning into who they are.

Slide 4

"Students should work really hard for what they are getting. And mostly that's because when they work really hard for it, they actually get to keep the content."

--Joslyn Ahlgren



Joslynn Ahlgren did a great job of summing up this idea. She teaches anatomy, and her students have to be able to easily access what they learn in her courses. Dr. Ahlgren focuses on showing students how to apply the information. Joslyn Ahlgren was awarded 2015-2016 Teacher/Adviser of the Year. You can see her full Faculty Spotlight interview on the teach.ufl.edu website in the Library section of the site.

Slide 5

Best learning occurs when. . .

- ▶ New knowledge is connected to existing knowledge
- ▶ Attention is focused on the learning experience
- ▶ Stimulate multiple senses

Of course, learning can happen in different ways. But connecting new information with what we already know as well as engaging more than one sense can be particularly helpful in setting students up to “keep what they have learned.”

Slide 6

Best learning occurs when. . .

- ▶ Students are motivated
- ▶ Engaged
- ▶ Community
- ▶ Ownership
- ▶ Frequent and helpful feedback

We all know that motivated students who really engage with the course material tend to do better. As do students who work together to collect, synthesize and share knowledge. The ownership that results when students analyze and reach their own conclusion is likely to support long-term use of the information. With teachers and TAs providing guidance and feedback along the way, students can move forward with confidence.

Slide 7

Active Learning

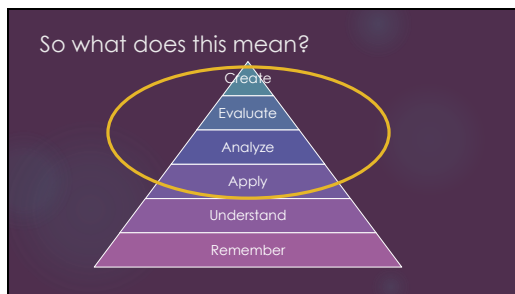
"Active learning means that the mind is actively engaged. Its defining characteristic is that students are dynamic participants in their learning and that they are reflecting on and monitoring both the processes and the results of their learning"

-- Elizabeth Barkley (2010)

So what, exactly IS Active Learning?

Elizabeth Barkley, who wrote *Student Engagement Techniques: A Handbook for College Faculty* (2010) suggests that Active Learning means that "students are dynamic participants in their learning." Essentially, Active Learning assignments and activities that promote engagement with the course material. That is, the students DO something. These types of activities can be as simple as a one paragraph reflection on a topic, a short discussion within a small group to performing experiments to test a hypothesis.

Slide 8



Assignments and activities that motivate, engage, and support collaboration are those that speak to the higher levels of Bloom's taxonomy.

Slide 9



As much as possible, activities that are consistent with the discipline are ideal. For example, back when I taught in Theatre and Dance, each of my Beginning Costume students created a garment that was worn in one of UF's Theatre or Dance productions. This photo is from an Agbedidi dance entitled Mangiani. In this example, beginning students designed and dyed the fabric, sewed the costume, attended fittings, and finally, saw their work on opening night.

To tell you the truth, organizing and managing so many students was extremely difficult and it would have been MUCH easier to simply "talk" about the costume creation process, but that wouldn't have given students the collaboration and communication experience that is central to Theatre and Dance production, not to mention the ownership of the work. To this

day, I hear from former students telling me what costume they created. Not only did they learn the costume process from the inside-out, but their personal creation is a source of pride.

Slide 10

Evidence?

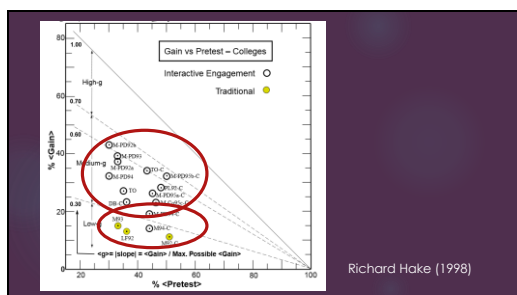
Interactive-engagement vs traditional methods: A six-thousand student survey of mechanics test data for introductory physics courses

48 courses which made substantial use of interactive engagement methods achieved nearly two-standard-deviation gains.

--Richard Hake (1997)

In Richard Hake did an analysis of the effectiveness of interactive-engagement methods. He compared courses that had continual interactive engagement of students through hands-on activities that included immediate feedback through discussion with peers and/or instructors to courses that relied upon passive lectures, recipe labs and algorithmic problem exams. Here is a chart that shows Richard Hake's findings. You can see the traditional lecture versus the engagement methods.

Slide 11



Slide 12

Evidence?

"Teaching cannot be reduced to formulaic methods and active learning is not the cure for all educational problems. However, there is broad support for the elements of active learning most commonly discussed in the educational literature and analyzed here."

-- Michael Prince (2004)

Michael Prince conducted a literature review looking for evidence of the effectiveness of active learning. Specifically, he looked for:

- Collaborative learning
- Cooperative learning
- Problem-based learning

Slide 13

Evidence?

30% Improvement in "C" or better grades, drop rate reduced from 28% to 2% in Circuits 1 at UF

Here at UF, the Circuits 1 Course achieved a reduction in the drop rate. The reduced drop rate is probably more important than the grade improvement, since we don't know for whether the grades are evaluating the same things before and after the course redesign.

Slide 14

Evidence?

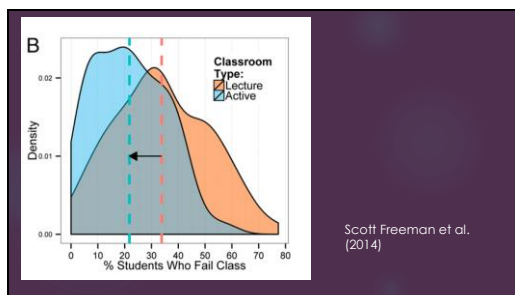
Active learning increases student performance in science, engineering, and mathematics

"Average examination scores improved by about 6% in active learning sections and students in the traditional lecture courses were 1.5 times more likely to fail than were the students in classes with active learning."

-- Scott Freeman et al.(2014)

Scott Freeman and company meta analyzed 225 studies that reported data on examination scores or failure rates when comparing student performance in undergraduate STEM courses between traditional lecturing and active learning. Average examination scores improved by about 6% in active learning sections and students in the traditional lecture courses were 1.5 times more likely to fail than were the students in classes with active learning.

Slide 15



Kernel density plots of failure rates under active learning and under lecturing. The mean failure rates under each classroom type (21.8% and 33.8%) are shown by dashed vertical lines.

Slide 16



So how do we go from this. . .

Slide 17



To this?

Slide 18

Strategies

- ▶ Live Group Quiz
- ▶ Role Playing
- ▶ Team-based Problem Solving
- ▶ Group Evaluation
- ▶ Group "textbook" wiki

- Live Group Quizzing: Genetics course
- Role Playing: Water Management course
- Team-based Problem Solving: Genetics
- Group Evaluation
- Group "textbook" wiki: Food Science and Human Nutrition
- Case Studies: Business and marketing courses
- Peer Instruction
- Diagramming/Images: Food Science, Biology
- Brainstorming
- Reverse Thinking

Slide 19

Strategies

- ▶ Case Studies
- ▶ Peer Instruction
- ▶ Diagramming/Images (Concept Map)
- ▶ Brainstorming
- ▶ Reverse Thinking

Slide 20

Strategies

- ▶ Popular culture/current events tie-in

Popular culture/current events tie-in

Slide 21

Strategies

- ▶ Peer Coaching
 - ▶ Biology Undergraduate Learning Assistants
 - ▶ Anatomy and Physiology LAs
- ▶ Team-based Learning
 - ▶ Wayne McCormack
 - ▶ <http://facdev.ufhealth.org/resources/tblatuf/>
 - ▶ <http://www.teambasedlearning.org/>

Peer Coaching

- Biology Undergraduate Learning Assistants
- Anatomy and Physiology LAs

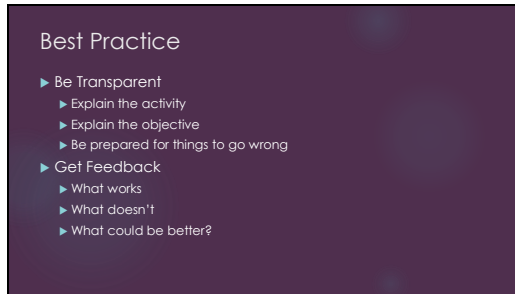
Team-based Learning

Wayne McCormack:

<http://facdev.ufhealth.org/resources/tblatuf/>

<http://www.teambasedlearning.org/>

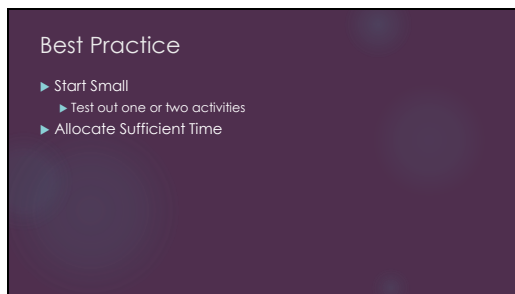
Slide 22



Best Practice:

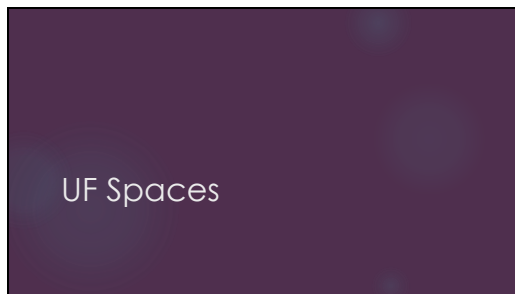
- Be Transparent
- Explain the activity
- Explain the objective
- Be prepared for things to go wrong
- Get Feedback
- What works
- What doesn't
- What could be better?

Slide 23



- Start Small
- Test out one or two activities
- Allocate Sufficient Time

Slide 24



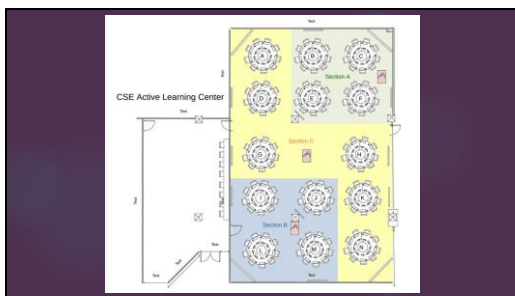
UF Spaces

Slide 25



CSE Active Learning Center

Slide 26



Floorplan of CSE Active Learning Center. The room can be sectioned off for smaller classes.

Slide 27



Top left Norman 250 (College of Education)

Slide 28



Norman 2309 (College of Education),

Slide 29



Matherly 120 (College of Business)

Slide 30



New Engineering 101 (College of Engineering)

Slide 31



Active Learning Initiative

Slide 32



Jointly supported by:

UFIT Classroom Support: Mark McCallister
markm@ufl.edu

IT Education and Training: Ashley Weser
abweser@ufl.edu

The Office of Faculty Development & Teaching Excellence: Jennifer Smith jksmith@ufl.edu .
Alexandra Bitton abutton-braddy@aa.ufl.edu

Slide 33



Request to be added to the Active Learning Initiative Canvas Course site:
<http://teach.ufl.edu/services/>

Slide 34

More information:
ALI Canvas course site

Contact FDTE to be added:
Jennifer Smith jksmith@ufl.edu
Alexandra Bitton abutton-braddy@aa.ufl.edu

Contact FDTE to be added to the ALI list:

Jennifer Smith jksmith@ufl.edu

Alexandra Bitton abutton-braddy@aa.ufl.edu

Slide 35

Sources

Bain, Ken. *What the Best College Teachers Do*. Cambridge, MA: Harvard UP, 2004. Print.

Barkley, Elizabeth F. *Student Engagement Techniques: A Handbook for College Faculty*. San Francisco: Jossey-Bass, 2010. Print.

Freeman, Scott, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth. "Science, Engineering, and Mathematics." *Proceedings of the National Academy of Sciences of the United States of America* 111.23 (2014): 8410-415. PNAS. Web. 13 May 2016.

Bain, Ken. *What the Best College Teachers Do*. Cambridge, MA: Harvard UP, 2004. Print.

Barkley, Elizabeth F. *Student Engagement Techniques: A Handbook for College Faculty*. San Francisco: Jossey-Bass, 2010. Print.

Freeman, Scott, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth. "Science, Engineering, and Mathematics." *Proceedings of the National Academy of Sciences of the United States of America* 111.23 (2014): 8410-415. PNAS. Web. 13 May 2016.

Slide 36

Sources

Finkelstein, Adam. "Designing Learning Spaces to Support Learning." Making Learning Spaces Work: Designing a Comprehensive Support and Faculty Development Program for Active and Collaborative Learning Spaces. Web. 9 Mar. 2016. *ELI Online Course*.

Hake, Richard. "Interactive-engagement vs Traditional Methods: A Six-thousand Student Survey of Mechanics Test Data for Introductory Physics Courses." *American Journal of Physics* 66 (1998): 64-74. *Serc Catalog*. Web. 13 May 2016.

Prince, Michael. "Does Active Learning Work? A Review of the Research." *Journal of Engineering Education* 93 (2004): 223-31. Web

Slide 37

Image Sources

Slide 2: Miller, Jeff. Nursing students work on "concept boards" in small groups during a School of Nursing class taught in an Active Learning Classroom. Digital image. *News*. University of Wisconsin-Madison, 20 Nov. 2014. Web. 13 May 2016.

Slide 15: Uske, John. Lecture hall. Digital image. *Flickr*. N.p., 1 Dec. 2008. Web. 13 May 2016.

Slide 16: University of Minnesota Regents. A pilot active learning classroom at the University of Minnesota. Digital image. *Here & Now*. WBUR Boston's NPR New Station, 8 May 2014. Web. 13 May 2016.