Postdoctoral Researcher
Lunch & Learn Series

Friday, June 22nd 2018

Creating

an Engaging

Classroom

Engagement

- **Has (at least) two components:**

  - **motivation** (goals, emotions)

  - **cognition** (thinking, reasoning)

- **How can we encourage learners to engage both motivationally and cognitively in our classrooms?**

Overview

- **Introducing Myself**

- **Goals of the Workshop**

- **An Interactive Activity**

- **A Heuristic for Getting Started**

  - instructional design frameworks

- **A Follow-up Activity**

Who Is this Guy?

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Research and Teaching

- **Core Research Interests**
  - educational technology, self-regulated learning, writing instruction, STEM education, peer learning

- **Courses**
  - HSE 390: Qualitative Research Methods
  - HSE 426: Training and Expertise
  - HSE 427: Designing for Learning
  - HSE 428: Judgment and Decision Making
  - PSY 304: Effective Thinking
  - PSY 320: Learning and Motivation

Student Feedback

- "I love how this class connected to a lot of the concepts I learned before. It really helped streamline the knowledge I was taking in. I loved our discussions in class and I got to form good bonds with my fellow peers."

- "I love how interactive it is. There is a good balance between lecture and discussions so the class is never boring but extremely informative."

- "I loved this course. It's really stimulating and I enjoyed the project we had to do in this class. I love how I get to know everyone in class and it formed a sense of community."

- "I wasn't looking forward to this class at the beginning of the semester but it actually ended up being one of my favorite courses. The teacher taught the material in a way that kept me engaged and interested."

What are We Doing Here?

- **Introduce tools for thinking about instruction and engagement**

  - again, both **cognition** and **motivation**

- **The 3Cs (curiosity, connections, and creating value) as a design heuristic**

- **Four research-based frameworks**

  - SDT, ARCS, 4C/ID, and ICAP (with sources)
  - may be useful for future teaching statements

Interactive Activity, Part 1

Pick a Topic...

1. think of a topic that you might cover in a typical lecture

2. take ~2 minutes to think about how you would explain the basics

3. grab a partner: explain! (~2 min.)

4. switch places: explain! (~2 min.)

5. Were you engaging?

The "Three Cs"

Curiosity, Connections, Creating Value

The Three Cs

- part of the entrepreneurial mindset

- **curiosity**: desire to learn, explore, and challenge existing ideas

- **connections**: integrate info from many sources (ideas); form and maintain collaborative partnerships (people)

- **creating value**: identify opportunities and applications, solve problems, and learn from failure

The Three Cs

- **align with research on how humans learn**

  - becoming interested in topics
  - maintaining attention and effort
  - integrating new and prior knowledge
  - generating ideas via reasoning
  - collaboration and teamwork
  - applying ideas to new problems
  - resilience and self-regulation

- **addressing the three Cs provides a blueprint for engaging learners**

First... Inspire Curiosity

- Why should learners care about the topic? Why do you care about it?

- Why do people need to learn this information? What use is it?

- What might be boring about it?

- Don't assume the value is obvious

Second… Make Connections

- How do new ideas **build on** or **relate to** what is already known?

- What principles can be **combined** to understand the topic?

- How might peers **work together** to explore the topic? Are **you** available?

- Expose learners to key ideas and help them make the mental links

Third... Create Value

- How does the topic apply to current problems and future careers?

- What are the concrete applications of this information? What are recent discoveries in this field?

- What innovations or answers become possible with this expertise?

- Highlight how the knowledge and skills could be put to use

The Three Cs

- Answering these questions helps you **empathize** with the learners...

- ... and design courses that can **engage** learners cognitively and motivationally

- **Next**: brief overview of research-based frameworks (**resources** for answering the 3Cs questions)

"Motivational" Frameworks

useful for understanding how to
inspire curiosity and value;
how and why learners become
motivationally (dis)engaged

Self-Determination Theory

- **Defines three needs that underlie intrinsic motivation**

  - need for competence
  - need for autonomy
  - need for relatedness

- **Satisfying these needs does not cause motivation, but thwarting them makes motivation less likely**

Competence: people need to feel **capable**; able to **develop** competence through their own effort

- **gradually** increase difficulty
- break up projects **into parts** that can be refined over time
- **feedback** and **encouragement**; don't neglect partial successes

Relatedness: people need to feel connected to others, belonging, and a sense of relevance

- **group** projects and **peer** discussion
- let students to **express themselves** or **achieve goals** via the class
- link assignments and projects to contemporary issues
- make sure examples showcase a variety of people

Autonomy: people need to feel **in control** of their outcomes; feel **agency**

- give **meaningful choices** in projects and team members
- ask for **student input** and feedback
- enable active participation
- clear policies for managing the class (e.g., grading, late policies, attendance)
- provide materials (readings, handouts) in advance so students can plan ahead

Related Reading

- Jang, H., Kim, E. J., & Reeve, J. (2016). Why students become more engaged or more disengaged during the semester: A self-determination theory dual-process model. *Learning and Instruction*, *43*, 27-38.

- Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149-172). Boston, MA: Springer.

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68-78.

ARCS Model

- **Framework for motivational design of learning materials**

  - attention
  - relevance
  - confidence
  - satisfaction

- **ARCS emphasizes iterative design; may take multiple attempts to get it right—pay attention to feedback**

Attention: curiosity and willingness to invest time and mental effort

- surprises, conflicts, **incongruity**
- reveal and confront misconceptions
- use a **variety** of teaching tactics
- questioning and participation
- highlight relevance, **utility**

Confidence: belief in one's ability to succeed or to grow through effort

- clear metrics and **requirements**
- **gradually** increasing difficulty
- use **summative feedback** to help students accurately self-assess
- use **formative feedback** to reveal how to improve

Relevance: sense of personal value and utility; connection to goals and life

- use examples that highlight clear **applications** and benefits
- link to job and **career readiness**
- projects and assignments that link to **personal interests** and topics

Satisfaction: feeling good about accomplishments; intrinsic reward

- apply to **real-world** settings
- **positive feedback**; encouragement
- no unconstructive criticism, **threats**, or assignments-as-punishment
- help students **appreciate** their successes (they may not realize)

Related Reading

- Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of Instructional Development, 10*(3), 2-10.

- Keller, J. M. (2010). *Motivational design for learning and performance: The ARCS model approach*. New York, NY: Springer.

- Li, K., & Keller, J. M. (2018). Use of the ARCS model in education: A literature review. *Computers & Education, 122*, 54-62.

"Cognitive" Frameworks

useful for understanding how humans
acquire knowledge and skills;
how learners attend to, remember,
and comprehend complex info

ICAP Framework

- **Framework for thinking about overt (visible) learning activities**

    - passive
    - active
    - constructive
    - interactive

- **ICAP argues that learners must invest effort to build on and apply ideas, and learners mutually support each other**

Passive: **no overt activity**; reading silently or listening to a lecture

- note that learners *may* be thinking, but the overt activity is passive
- for instructors, there is **no way to measure or guide the "thinking"** until it's too late (e.g., an exam)
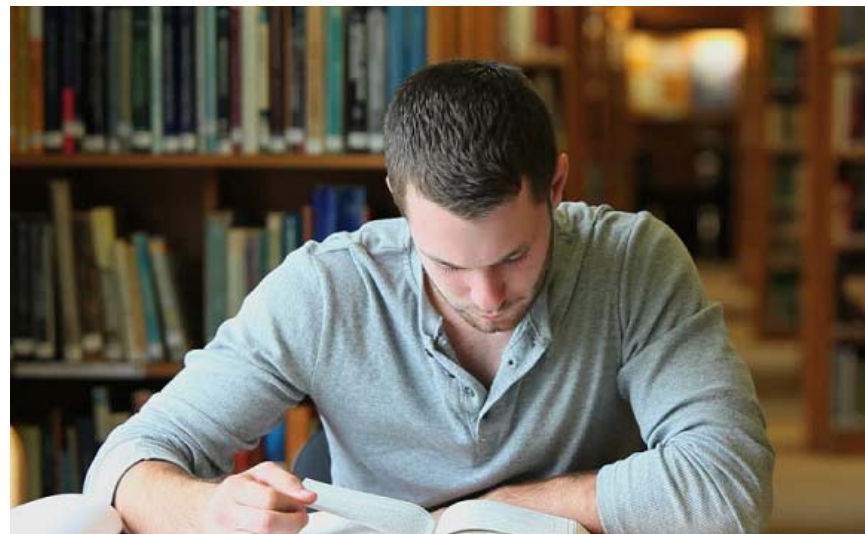
Active: visible behaviors; selecting or recording information **unchanged**

- taking **notes** in lecture, **highlighting** when reading, **talking** to a peer
- acquiring information "as is" but not necessarily using or connecting it
- effort is expended… but **is it *good* effort** that results in learning?

Constructive: learner **generates** news ideas; **applies** ideas in new ways; **transforms** and builds on ideas (solo)

- self-questioning during reading
- writing an original essay on a topic
- building a model or simulation
- problem-based learning
- conducting an experiment

Interactive: learners generate ideas **together**; **co-construct** knowledge

- *not* just talking or cooperating
- multiple learners make contributions that **build on each other**
- develop ideas and strategies that might have been impossible alone
- **mutual** work, thinking, and help

Related Reading

- Chi, M. T. H. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, *1*(1), 73-105.

- Chi, M. T. H., & Wylie, R. (2014). Chi, M. T., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, *49*(4), 219-243.

- Menekse, M., Stump, G. S., Krause, S., & Chi, M. T. H. (2013). Differentiated overt learning activities for effective instruction in engineering classrooms. *Journal of Engineering Education*, *102*(3), 346-374.

4C/ID Model

- **Comprehensive instructional design model for planning lessons**

    - learning tasks
    - supportive information
    - procedural information
    - part-task practice

- **Focuses on learning of complex topics; concrete recommendations**

Lesson Tasks: concrete and specific tasks intended to explore necessary ideas, strategies, and skills

- must be **authentic**, relevant
- comprehensive sequence of tasks should ideally cover **all skills**
- **sequence**: simple-to-complex
- require **mental work**; transformation
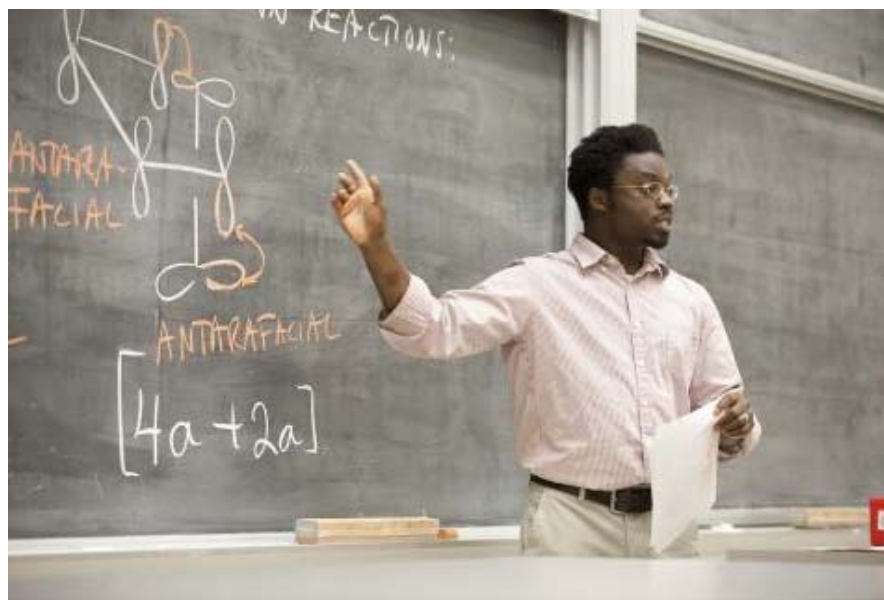
Supportive Information: info that learners **need to know** (or have access to) for success and progress

- **background** knowledge; references
- task-specific **strategies**
- models, **demonstrations**, examples
- **connect** new ideas to prior ideas
- e.g., lectures and textbooks

Procedural Information: key "how to" information; feedback

- **feedback** and information as learners progress through tasks
- **step-by-step** information
- corrective feedback
- **"just in time"** hints and info
- focuses on skills and behaviors that need to be "automatic"

Part-Task Practice: breaks larger tasks and skills into **components** that can be practiced individually

- the complete task may **overwhelm novice learners**; avoid that!
- feedback on a part of the task can be more targeted and specific
- learners assemble a **"tool box"** of skills and operations

Related Reading

- Van Merriënboer, J. J. G., Clark, R. E., & De Croock, M. B. (2002). Blueprints for complex learning: The 4C/ID-model. *Educational Technology Research and Development*, *50*(2), 39-61.

- Van Merriënboer, J. J. G, Kirschner, P. A., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist*, *38*(1), 5-13.

- Van Merriënboer, J. J. G., & Sluijsmans, D. M. (2009). Toward a synthesis of cognitive load theory, four-component instructional design, and self-directed learning. *Educational Psychology Review*, *21(1*), 55-66.

Interactive Activity, Part 2

Review your Topic...

1. How would you inspire curiosity?

2. What are key connections to make (a) between ideas and (b) for your audience?

3. What are the immediate benefits or future applications?

4. Explaining time! (~ 2 min. each)

Trial and Error

- **Creating an engaging classroom is an iterative process—and not easy**

- **Try out different strategies, tools, resources, and approaches**

- **Take notes and collect feedback from students**

  - this also respects autonomy and relevance

the ADDIE MODEL
is a five-phase approach to building effective learning solutions

1 ANALYZE the instructional goals, target audience, and required resources

Instructional goals (1) respond to competency gaps caused by lack of knowledge and skills, and (2) state desired outcomes of successful course completion.

Target audience characteristics (e.g., existing knowledge and skills, experience level, language proficiency, motivation) inform decisions throughout the ADDIE process.

Required resources (content, technology, facilities, and human) and potential delivery methods are determined.

2 DESIGN a learning solution that aligns objectives and strategies with instructional goals

Learning objectives define specific, measurable actions that will enable learners to fulfill instructional goals.

Instructional strategies (1) establish clear links between course content and learning objectives, and (2) introduce content and learning activities in a logical sequence that supports the learners' construction of knowledge and skills.

Testing strategies provide feedback on the learners' progress in meeting the defined learning objectives.

**3 DEVELOP** learning resources, validate and revise drafts, and conduct a pilot test

Learning resources are generated by integrating content and strategies with supporting media and developing guidance for instructors and learners.

Validation of resources in development is performed through stakeholder review and subsequent revision.

A pilot test and the feedback/observations collected offer insight into final adjustments that should be made before implementing the learning solution.

4 IMPLEMENT the learning solution by preparing the learning space and engaging participants
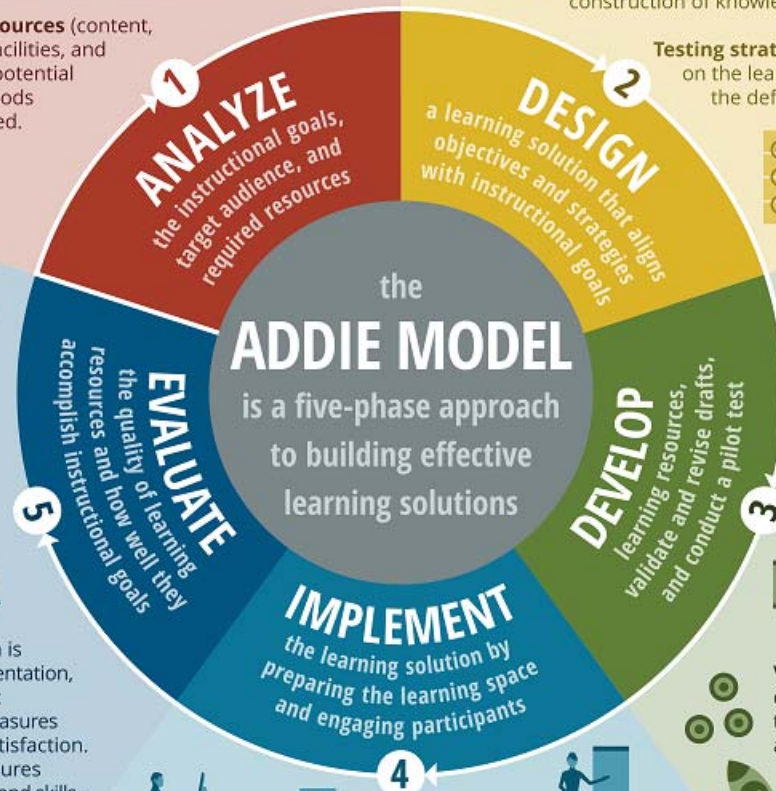
Participant engagement begins with notification and enrollment, followed by pre-course communication and interaction with the newly developed learning resources.

Preparation for an instructor-led course identifies and schedules qualified individuals to act as facilitators and take part in a train-the-trainer workshop.

5 EVALUATE the quality of learning resources and how well they accomplish instructional goals

Formative evaluation is conducted prior to implementation in order to determine whether the quality of learning resources satisfies the standards established in the Design phase.

Summative evaluation is conducted after implementation, generally at three levels:
Level 1: Perception measures degree of participant satisfaction.
Level 2: Learning measures acquisition of knowledge and skills.
Level 3: Performance measures transfer of newly acquired knowledge and skills to an actual work environment.

Reference:
Branch, R. M. (2009). *Instructional design: The ADDIE approach*. New York: Springer.

Obsidian LEARNING

Thank You!