Active Learning with CATs

Overview

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“One of the most promising ways to improve learning is to improve teaching.”

Angelo & Cross (2005, 7)
Active Learning Strategies

• Active learning strategies are one way to grab and sustain attention and involve students more deeply in learning experience.
• There are many types of active learning strategies
• Including CATs is one way to incorporate active learning in live sessions or in preparation for flipped sessions.
What are CATs?

The acronym CATs refers to Classroom Assessment Techniques

- CATs are strategies for ongoing assessment of student knowledge and performance in adult and higher education

- The goals of using CATs are to:
  - Guide curriculum content
  - Enhance teaching methods
  - Monitor how much and how well students are learning

Angelo & Cross (2005)
The CATs Model

Based upon theories of adult and active learning

Uses active learning strategies to enhance learner engagement and experience

Implements explicit goals and objectives for learners

Emphasizes the use of formative assessment and timely, constructive feedback to improve learners’ outcomes

Aims to reduce the gap between teaching and summative assessment

Emphasizes systematic inquiry and intellectual challenge to promote learning
CATs should be...

Learner-centered: Guides students in learning & developing skills for learning

Teacher-directed: Guides instructors in where & how to begin or adapt instruction

Formative: Provides immediate evaluation and/or feedback

Ongoing: Generates a “feedback loop”
How do we know whether we need CATs?

An introduction to the SAMR model for integrating education technology
The SAMR Model

- Used to determine whether particular technology can substitute for a low tech way of involving students in active learning or require greater modification or redesign of the learning experience.

- [View, SAMR Model](#) Video By Julie Youm PhD, Instructional Technologies Group, University of California, Irvine, School of Medicine

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We can use the same SAMR concept for reviewing block sessions to determine whether they

- contain essential content
- include active learning strategies
- sustain student attention
- require some level of change and/or faculty support for making changes.
Do block sessions need to be...
- Transformed?
- Or, simply enhanced?

**REDESIGN Learning Experience**
- No active learning strategies (ALS)
- Entire session requires redesign to accommodate content & ALS approach
- Considerable faculty support needed

**MODIFY Learning Experience**
- No ALS
- Significant change in session content to accommodate ALS
- Moderate faculty support needed

**AUGMENT Learning Experience**
- At least 1 ALS
- Requires inclusion of technology to be effective/efficient
- No significant change in content
- Some faculty support needed

**SUBSTITUTE Activity/Tech**
- At least 1 ALS
- Simple substitution adds ALS\tech
- No faculty support needed
The authors of Classroom Assessments for Teaching* created a self-scorable version of their Teaching Goals Inventory*.

Block directors could use the TGI to:

- Evaluate whether course goals are reflected in session learning objectives
- Consider how they want to prioritize course goals and session learning objectives
- Help faculty to determine whether their sessions need enhancement or redesign

*Angelo & Cross (2005)
TGI Report identifies the top 3 Course Goals
Providing context for session objectives and activities

Apply
- Apply principles & concepts

Enhance
- Analytic skills

Develop/Enhance
- Problem-solving skills
The TGI asks you which of the following you would like your block to emphasize...

- Content knowledge
- Analytic or problem-solving skills
- Communication skills
- Self-efficacy
- Reflection and metacognitive engagement
Compare Session LO’s to TGI Results

• You can use the TGI results to compare your preferences to session learning objectives to determine if session learning objectives reflect those preferences?

• If TGI results emphasize your preference for promoting higher order thinking, but your session objectives do not, you can use Bloom’s to revise session learning objectives and faculty can include CATs or other active learning strategies that aim to promote the desired level of engagement.
Session Learning Objectives

• Should drive the selection or design of active learning strategies, including CATs

• Use Bloom’s to articulate session learning objectives in ways that describe the kind of thinking in which you want students to engage

• Select the type of CAT that aims to promote that level of engagement
Example: Matching CATs to Bloom’s Taxonomy

**Lower Order**

- **Recall** - Use CATs requiring students to demonstrate current knowledge or skill

**Higher Order Thinking**

- **Application** - Use CATs requiring students to apply new knowledge
- **Analysis** - Use Problem-solving CATs
- **Synthesis** - Use CATs that ask students to design & plan
There are 3 CAT Categories

1. Assess Prior Knowledge, Recall And Comprehension
2. Assess Learner Attitudes, Values & Self-awareness
3. Assess Learner Reactions to Instruction to learn how students learn

Select types that best suit the goals
Each CAT estimates the amount of effort required for 3 factors:

- Faculty effort: Low, Medium, High
- Student effort: Low, Medium, High
- Data Analysis Effort: Low, Medium, High
What affects whether effort is low, medium or high?

- Content Expertise
- Tech fit
- Tech availability
- Tech skills
- Faculty support/coaching

Time in planning, implementation and analyzing results
Summaries of Classroom Assessment Techniques (strategies) that assess prior knowledge, comprehension, and analytic thinking
<table>
<thead>
<tr>
<th>Purpose</th>
<th>Description</th>
<th>Teaching Goal</th>
<th>Effort</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess students’ skills at digesting and categorizing important information according to a given set of critical defining features</td>
<td>• Requires students to categorize concepts according to the presence or absence of important defining features</td>
<td>• Improve analytic skills, ability to draw inferences and generate taxonomies of knowledge</td>
<td>• Faculty: Medium (content expertise)</td>
<td>• Low tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop study skills</td>
<td>• Student: Low</td>
<td>• PDF matrix</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Learn concepts, facts &amp; theories of subject</td>
<td>• Data Analysis: Low(technology)</td>
<td>• Medium tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Poll Everywhere (Rank Poll)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Qualtrics (Sort poll)</td>
</tr>
</tbody>
</table>

Defining Features Matrix

Especially applicable to Pharmacology
### Purpose
- Enables faculty to find out how concisely, completely and creatively students can organize and summarize sizeable and significant information
- Promotes ability to articulate

### Description
- Instructor asks students to summarize in one sentence the import of content addressed in a given session - e.g., What do we need to know in order to do X and why?

### Teaching Goal
- Enhance memory
- Improve listening and reasoning skills
- Develop ability to synthesize related concepts
- Improve ability to summarize knowledge and articulate reasoning

### Effort
- Faculty: Low
- Student: Medium
- Data Analysis: Medium - requires qualitative assessment

### Technology
- Low tech
  - Verbal
  - Paper & pencil
- Medium tech
  - Poll Everywhere
  - Qualtrics (open ended)
  - Document upload to LMS

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**One Sentence Summary**

Any subject matter, any context
Reference & Resources

- Teaching Goals Inventory
  - Self-scoring ([online](#), [PDF](#))
  - Online scoring (University of Iowa)
- Text
For Faculty & Block Team Support

Contact
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View other FID in Transition Guides, including:

- Sample CATs
- TGI Guide

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Take the FID Needs Assessment