Want a Quick and Easy Way to Improve Your Course? Let the CAT Out of the Bag!

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Objectives

1. Define and summarize the functions of assessment and Classroom Assessment Techniques (CATs) in the educational environment

2. Select CATs that would be appropriate for utilization in different educational scenarios, and examine strategies for analyzing, responding to, and monitoring changes made in response to the feedback gathered from them.

3. Analyze the role of CATs in program assessment and NAACLS standards compliance.

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FUNDAMENTALS OF ASSESSMENT

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How we usually think about assessment…

How we should think about assessment…

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What is Educational Assessment?

- Assess - to determine the value, significance, or extent of; appraise
- Assessment - is the process of objectively understanding the state or condition of a thing, by observation and measurement. Assessment of teaching means taking a measure of its effectiveness.
- Educational Assessment: An **ongoing process** aimed at **understanding and improving student learning.** It involves making expectations **explicit and public**; setting appropriate criteria and high standards for learning quality; **systematically gathering, analyzing, and interpreting evidence** to determine **how well performance matches those expectations and standards,** and using the resulting information to **document, explain, and improve performance**
  – Angelo, TA. Reassessing (and Defining) Assessment. *AAHE Bulletin*, 1995;48(3):7.
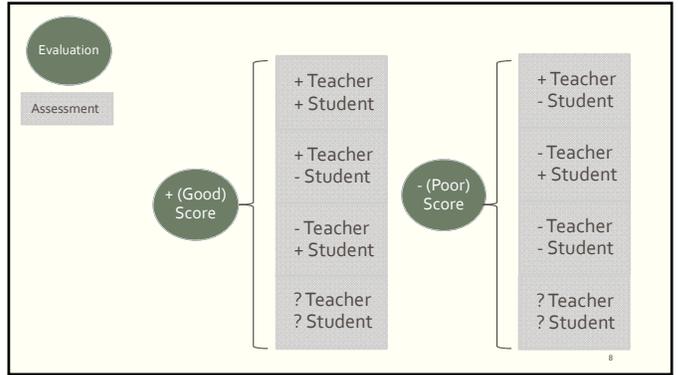
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Assessment Terminology

- **Formative assessment** is measurement/monitoring for the purpose of improving student learning; ongoing

- **Summative assessment** is measurement/monitoring for the purpose of evaluating student learning (evaluation); at the conclusion of an activity
  – **Evaluation** is the process of observing and measuring a thing for the purpose of judging it and of determining its value/quality either by comparison to similar things, or to a standard. Evaluation of teaching means passing judgment on it as part of an administrative process.
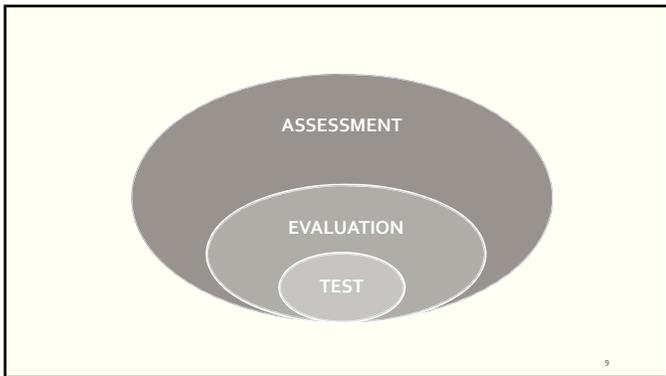
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Slide 7

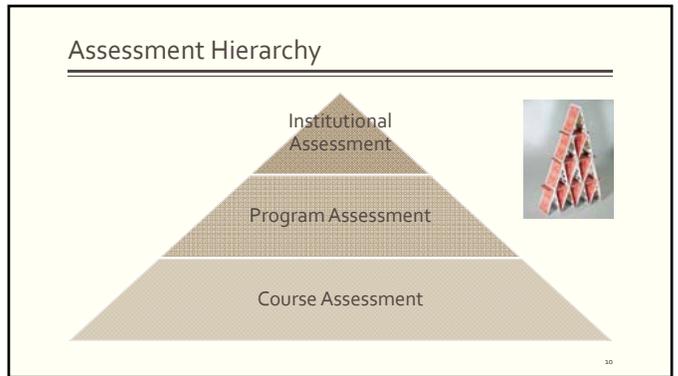|	Assessment	Evaluation
Purpose	Provides feedback on performance and areas of improvement.	Determines the extent to which objectives are achieved.
Timing	Formative (Ongoing)	Summative (Final)
Measurement	Process-Oriented (How is learning going?)	Product-Oriented (What is being learned?)
Criteria/Goals	Reflective (Internally defined)	Prescriptive (External standards)
Findings	Diagnostic (Identify areas of improvement)	Judgmental (Arrive at a score/grade)
Modifiability	Flexible	Fixed
Relationship	Cooperative	Competitive

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Evaluation

Assessment

+ (Good) Score
- + Teacher + Student
- + Teacher - Student
- - Teacher + Student
- ? Teacher ? Student

- (Poor) Score
- + Teacher - Student
- - Teacher + Student
- - Teacher - Student
- ? Teacher ? Student

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ASSESSMENT

EVALUATION

TEST

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Slide 10

Assessment Hierarchy

Institutional Assessment

Program Assessment

Course Assessment

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Slide 11

Institutional Assessment

Higher Learning Commission   President; Provost

Lab Program Assessment

NAACLS   Program Director; Chair

Course Assessment

Program Assessment Plan   Faculty/Instructor (YOU!)

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Assessment Cycle

- Define Learning Objectives/Activities
- Gather Evidence / Collect Data (ex. CATs)
- Analyze Collected Data
- Take Action (Improve)
- Monitor Impact of Action(s)

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COURSE ASSESSMENT TECHNIQUES (CATS)

- Define Learning Objectives & Activities
- Gather Evidence / Collect Data (ex. CATs)
- Analyze Collected Data
- Take Action (Improve)
- Monitor Impact of Action(s)

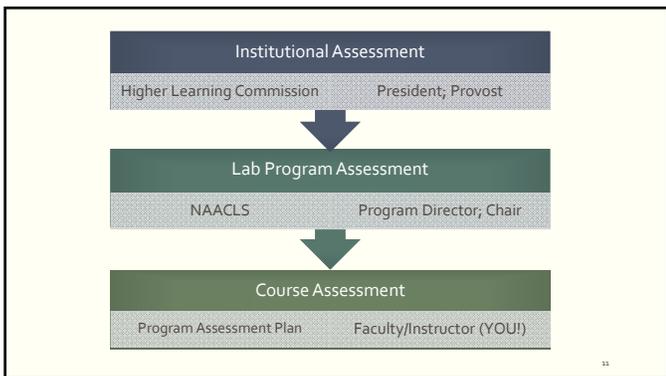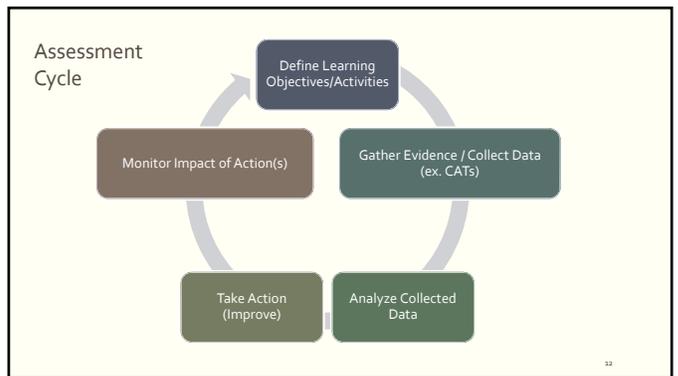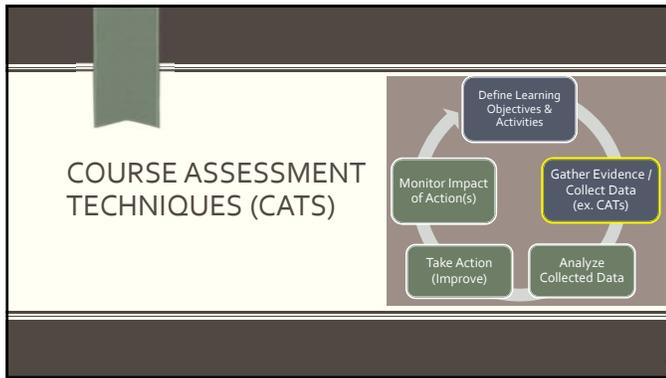## Classroom Assessment Techniques (CATs)

- Definition: simple tools for collecting data on student learning in order to improve it; instruments utilized as a systematic approach to gathering data related to classroom assessment
- When: real-time; throughout a course or learning activity
- Advantages: typically a simple, quick way to gather feedback specific to your course/concerns; students get a chance to see their feedback in action
- Disadvantages: may reveal things we don't want to see/hear; may reveal things we cannot change

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CAT Collection Methods

- Paper / Pencil
- Oral / Verbal
- Show of Hands
- Technology / Apps
  – Learning Management System (ex. Blackboard®)
  – ResponseWare®
  – Qualtrics®
  – Poll Everywhere®
  – Top Hat®

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How do you get student buy-in?

- Be sincere and deliberate in the request (beg?)
- Give a past example that shows them the benefit
- Outline the difference between CATs and traditional end-of-the-course approaches
- Consider a score or 'reward' for participation
- Actually use CAT feedback to make a change during the course, and let the students know it was due to their feedback

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CAT Examples

- Minute Paper
- Muddiest Point
- Concept Maps
- Chain Notes

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Muddiest Point

Description	• One of the simplest, most efficient CATS • Ask "What was the muddiest point in _____?"
Purpose	• Provides info on where students are getting 'hung-up' • Helps teacher know what to focus on and for how long
Pros	• Quick; simple; anonymous; can address immediately; straightforward data; internalization
Cons	• Don't want students to focus only on what isn't known; may be disheartening to instructor

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Muddiest Point

Suggestions for Use

- At the end of an activity
  - What was the muddiest point in today's (lab, lecture, clinical/bench rotation)?
  - ❖ Consider ending class a few minutes early and utilizing that time to review the topic identified by most as the muddiest
  - ❖ Consider utilizing technology

- During an activity
  - What was the muddiest point about the (lecture topic, gram staining procedure)?
  - ❖ Consider utilizing this as a break point during a longer lecture

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Minute Paper

Description	• Ask "What was the most important thing you learned today" & "What remains unanswered"
Purpose	• Provide valuable data on what is working and what isn't, allows for possible adaptation
Pros	• Low time, planning, and analysis investments; helps students reflect; real-time; shows you care
Cons	• Can become 'gimmicky' if over-used

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Minute Paper

Suggestions for Use

- At the end of an activity (similar to 'muddiest point')
  - ❖ Consider variations on the questions:
    - What went well? What could have gone better?
    - What promoted your learning? What hindered your learning?
    - What has been your favorite part of the course so far? Your least favorite?
  - ❖ Consider incorporating into an existing assignment (an exam, lab, etc.) for points or bonus points
  - ❖ Can be adapted easily for online courses

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Concept Map

Description	• Ask students to draw or diagram major concepts to help foster mental connections
Purpose	• Shows where connections are/aren't being made in a multi-step or multi-dimensional process
Pros	• Get a different perspective; can see the 'steps' involved in student understanding; appeals to visual learners
Cons	• Takes a bit more time for students to do and you to analyze; harder to interpret results (sometimes)

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Concept Map

Suggestions for Use

- When teaching a process or procedure
  - Coagulation cascade; kidney function, etc.

- When teaching result correlation / interpretation
  - Given an initial set of results, what further testing is needed and what are the potential diagnoses?

- When teaching troubleshooting
  - Drawing out if/then scenarios

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Chain Notes

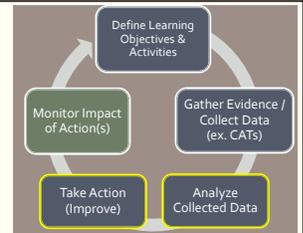| Description	• Ask each student in a class to answer a single-question in his/her own words
Purpose	• Gives instructor a view from all student perspectives, and an idea of what they are paying attention to
Pros	• Quick; anonymous; in-the-moment (instead of at the end); may give students motivation to stay on task
Cons	• Can be difficult to interpret; can distract students from the whole picture

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Chain Notes

Suggestions for Use

- Any time you feel students are struggling to stay on-task
  – Long/tough topic; busy/stressful time

- To highlight an important and/or abstract concept
  – Safety policy; quality control; etc.

- To see if a new teaching approach or strategy is helpful
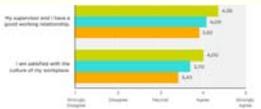 – Ex. Active learning; different explanation of a topic in a lecture

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ANALYZING & RESPONDING TO FEEDBACK

- Define Learning Objectives & Activities
- Gather Evidence / Collect Data (ex. CATs)
- Analyze Collected Data
- Take Action (Improve)
- Monitor Impact of Action(s)

Types of Analysis

QUANTITATIVE ANALYSIS
- Measurable data
  - Scaled surveys
  - Numeric results
  - Statistics

QUALITATIVE ANALYSIS
- Non-measurable data
  - Interviews/focus groups
  - Purposeful observations
  - Open-ended survey questions
  - Non-numeric results

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Analysis of Data

QUANTITATIVE: Numbers, Calculations, Statistics	QUALITATIVE: Coding, Comparative Analysis

MIXED METHODS:
A little of both!

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Example: Mixed-Methods Approach

	Easier	It is a lot easier to navigate.
	Faster / more efficient	I can identify more than one cell at the same time.
	Easier	Easier to see/identify cells.
	Better images	Digital slides give crisper images.
	Clearer picture	I like the bigger and clearer picture on the computers.
	Easier to talk about viewing area	It was easier to point out or see what my instructors were pointing out about the cells.
	Better detail	You can see more detail.
	More efficient	Students can spend more time focusing on cell details before they have to be proficient at using a microscope.
	Easier	Easier to zoom in and out.
	Easier to talk about viewing area	Easier to communicate what I was seeing with the instructor.

Ease of Use
Efficient
Visual Strengths
Communication

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Example: Mixed Methods Approach

Digital Slide Preference Reasoning		
Theme	**Comments ($n=47$)**	**Example Comment(s)**
Ease of Use	17	It is a lot easier to navigate. Easier to zoom in and out. Easier to see/identify cells.
Visual Strengths	14	Digital slides give crisper images. You can see more detail. I like the bigger and clearer picture on the computers.

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Analysis of Data

- In lab language now please...

  - Identify themes (trends)
  - Identify changes (shifts)
  - Identify 'no action' outliers
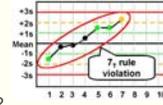 - Identify 'take action' outliers

- Must address any issues before proceeding to patient testing [further teaching]...

Huh?

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"TREND" in Assessment Feedback

- What is it?
  - Multiple comments progressing to the same message over time

EXAMPLE:
Something is 'expiring' (hopefully not you!)

- Why?
  - Something is becoming more of an issue/focus over time

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"SHIFT" in Assessment Feedback

- What is it?
  - Multiple comments suddenly with the same message

EXAMPLE:

You just did some maintenance
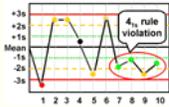
- Why?
  - Something has changed in the learning environment

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"OUTLIERS" in Assessment Feedback

- What is it?
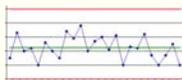 - A random comment that doesn't fit with the majority
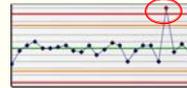
EXAMPLES:

'Take Action' Outlier – Easy Fix!

'No Action' Outlier - Exclude!

- Why?
  - Good question!

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"NORMAL" Assessment Feedback

- What is it?
  - Feedback that is expected; similar to what you have been seeing (often due to things out of your control)

EXAMPLES:

I would be nice to have open-book tests

I wish we didn't have time limits in lab

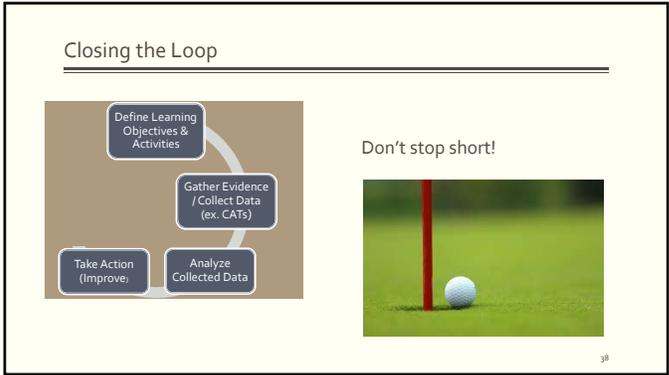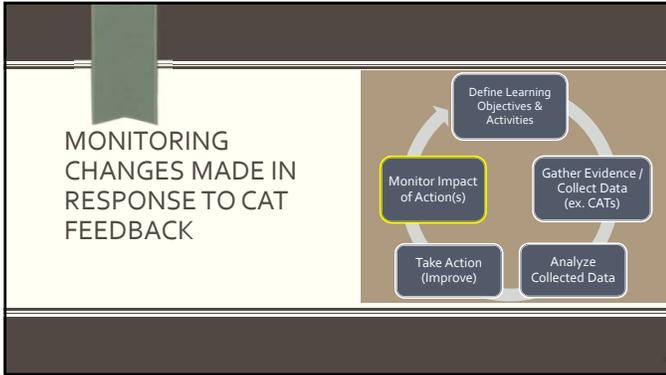I wish I had taken this course earlier

I don't like the textbook

I like the case studies

- Why?
  - Because students are trying to come up with a response; Maybe a big/obvious change isn't needed

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Responding to Feedback

- A response is warranted:
  - When a safety, accreditation, institutional issue is confirmed
  - When there is an opportunity for a good 'teaching moment'
  - When there is a potential benefit
  - When there is an easy fix

- A response may not be warranted:
  - When you haven't had enough time to make an accurate evaluation
  - When the resulting change may be detrimental to those involved
  - When the response would require unreasonable/unrealistic commitments
  - When there is a pedagogical reason for the current approach/design

- Consider the level at which the change should be implemented (course, program, institutional)

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MONITORING CHANGES MADE IN RESPONSE TO CAT FEEDBACK

Define Learning Objectives & Activities

Monitor Impact of Action(s)

Gather Evidence / Collect Data (ex. CATs)

Take Action (Improve)

Analyze Collected Data

Closing the Loop

Define Learning Objectives & Activities

Gather Evidence / Collect Data (ex. CATs)

Take Action (Improve)

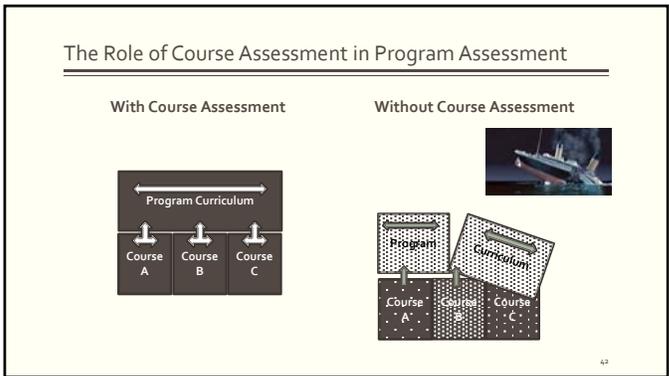Analyze Collected Data

Don't stop short!

I already made changes to try to make my course better, why do I have monitor them?!

- To see if your change really does fix the problem
- To see if your change is just a partial fix
- To make sure the change wasn't just a one time fix
- To make sure other different issues don't arise because of the change

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Documentation of Monitoring

Issue	Action	Impact of Action	DECISION? (Continue, Revise, Discard)	Notes
Students stated on CAT from 1st practical that it would be helpful to have the pre-lab lectures online (to have more time in lab)	Make distance pre-lab lectures available online for on-campus students.	Students were happy about the change, but seemed like some students didn't listen to the lectures	Continue; BUT add a 'lecture quiz' that is due prior to the start of class	Worked much better with lecture quiz (it forced them to listen ahead of time)

THE ROLE OF CATS IN PROGRAM ASSESSMENT / NAACLS COMPLIANCE

The Role of Course Assessment in Program Assessment

With Course Assessment

Program Curriculum

Course A

Course B

Course C

Without Course Assessment

Course A

Course B

Course C

Where do CATs fit into NAACLS Standards?
(Revision 11/2017)

II. Assessment and Continuous Quality Improvement

A. Systematic Assessment
  – There must be a documented plan for <u>continuous and systematic assessment</u> of the effectiveness of the program.

C. Program Assessment and Modification
  – The results of program outcomes measures <u>and assessment</u> must…be:
   2. Analyzed to demonstrate the effectiveness of any changes implemented

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Where do CATs fit into NAACLS Standards?

VII. MLS Program Administration

C. Faculty

b. Responsibilities.
  – The responsibilities of the faculty/instructors must include:
   iii. development of curriculum, policy and procedures
   iv. Assessment of program outcomes.

VIII. Curriculum Requirements

C. Evaluations

▪ Documentation for Site Visits and Joint Accreditation/Approval Site Visits:
  – Documentation of programmatic curriculum improvements and changes made as a result of systematic program review.

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THE END

Questions?