Doing Valid and Reliable Assessment

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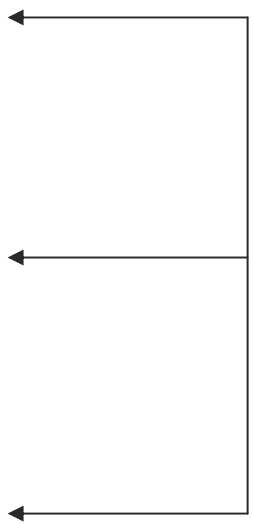
Model of Classroom Learning and Teaching

a) Learning Objectives

b) Instruction

c) Assessment of Learning



Self-Assessment Exercise 1.0

In terms of the *Model of Classroom Learning and Teaching*, what is missing in the following situations:

1. You are teaching your first course in *Fashion Design*, and it starts next week. You want your students to be highly motivated and learn a lot from the course. In planning the course, you begin by pulling together the most interesting content and interactive learning activities you can find to fill up a semester's worth of instruction. WHAT'S MISSING?

Self-Assessment Exercise 1.0

2. You have been teaching an *Introduction to Psychology* course for three weeks, and things have been going well. It is time for the first test, and you want to give it first thing tomorrow in class. It is now 5 PM and you several errands to do on your way home, but you need to develop the test first. You quickly flip through the Teacher's Manual that accompanies the textbook, and pick out 30 test questions provided for the three chapters you have covered thus far. There, you have the test ready to go (and it only took 20 minutes)! WHAT'S MISSING?

Self-Assessment Exercise 1.0

3. The semester is half over in the *Microsoft Office Applications* course you are teaching. Your students have started coming up to you after class, complaining they do not have a “big picture” of what they are suppose to be learning and how well or poorly they are doing. WHAT’S MISSING?

Focus on Learning Objectives

- *Learning Objectives* . . .
  a. student learning outcomes as a result of instruction
  b. control what happens throughout *Instruction* and *Assessment of Learning*

Focus on Learning Objectives

c. stated in terms of learning behaviors that you can see and measure

d. specify content AND “level of learning” you want students to practice and develop

Three Different "Levels of Learning"

(First Level)

a. ***Foundational Content*** – learning outcomes in the form of

- *knowledge* (producing memorized facts, definitions, rules, steps in a procedure, etc.)
- *comprehension* (restating the meaning of new content in student's own words)

Three Different "Levels of Learning"

(Second Level)

b. ***Application***– learning outcomes in the form of using Foundational Content to apply to new situations or solve new problems

Three Different "Levels of Learning"

(Third Level)

c. ***Higher Order Process*** – learning outcomes in the form of

a. analysis of ideas or concepts into component parts,
b. bringing together *component* ideas or concepts to form original *whole* idea or concept, or
c. judgments about the acceptability of ideas or concepts

Three Steps for Creating Learning Objectives…

(First Step)

a. Decide the content and “level of learning” for each Learning Objective

Three Steps for Creating Learning Objectives…

(Second Step)

b. Make sure Learning Objectives are stated in terms of learning behaviors that you can actually see happen; use “action verbs”

Three Steps for Creating Learning Objectives…

(Third Step)

c. Make sure Learning Objective's "level of learning" is reflected in "action verb"

Self-Assessment Exercise 4.0

Evaluate the Following Learning Objectives and specify which "levels of learning" they represent:

1a. Students will understand the five principles of design.

1b. Students will recite the formal definition for each of the five principles of design.

1c. Students will determine which one of five design principles applies to a newly presented design object.

1d. Students will use five design principles in creating an original item of clothing.

Self-Assessment Exercise 4.0

IIa. Students will know technical vocabulary associated with C++ programming.

IIb. Students will define, using their own words, the technical vocabulary associated with C++ programming.

IIc. Students will use correctly technical vocabulary associated with C++ programming in presenting their Final Project.

IId. Students will evaluate how well their peers use technical vocabulary in presenting Final Projects, including analysis of alternative vocabulary to improve communication clarity.

Focus on Assessment and Content Validity

Assessment is. . .

…creating and implementing assessment techniques for observing, measuring, and making decisions about student learning

Different assessment techniques are a better or worse *match* for different "levels of learning"

Foundational Content

(Level of Learning)

Learning Objective:

- Students will recognize the distinction between a *series* and a *parallel* electric circuit

Foundational Content

(Level of Learning)

Assessment Technique:

Which statement describes the difference between a series and a parallel electric circuit? (circle one)

a. In a *series* circuit, there is only one path for the electrons to flow; in a *parallel* circuit, there is more than one path for electrons to flow.

b. In a *series* circuit, there is more than one way for electrons to flow; in a *parallel* circuit, there is only one way for electrons to flow.

c. In a *series* circuit, electrons flow in a clockwise direction; in a *parallel* circuit, they flow in a counter-clockwise direction.

d. In a *series* circuit, electrons flow in a counter-clockwise direction; in a *parallel* circuit, they flow in a clockwise direction.

Application

(Level of Learning)

Learning Objective:

- Students will apply the principle of series vs. parallel to various electric circuits.

Assessment Technique:

- You have a string of lights. When one particular light burns out, all the lights beyond that point fail to light up. This is an example of _____. (circle one)
  a. a parallel circuit
  b. a series circuit
  c. a dual circuit (both series and parallel)
  d. neither a series or parallel circuit

Higher Order Processes

(Level of Learning)

Learning Objective:

- Students will design electric circuits that capitalize on the distinctive characteristics of series vs. parallel.

Assessment Technique:

- Given specifications about an electrical source and a required set of electrical tasks, evaluate whether a series or parallel design optimally satisfies the situation, justify this evaluation, and design and build the electric circuit.

Content Validity

- If your assessment techniques collect information about student learning that **matches** both Learning Objectives and Instruction, then decisions about student learning will have **strong content validity.**

Content Validity

- If your assessment techniques collect information about student learning that **does not match** Learning Objectives and Instruction, then decisions about student learning will have **weak content validity.**

Self-Assessment Exercise 9.0

I. You teach an *Art History and Appreciation* course. You have established ten Learning Objectives for this course. Five of the Learning Objectives emphasize *knowledge* of facts: dates, artists, materials, and the cultural contexts of famous paintings throughout various artistic periods. The other five Learning Objectives emphasize use of art design principles to *analyze and evaluate* paintings.

True to your Learning Objectives, throughout the course you have spent about 50% of your instructional time helping students develop Foundational Content, and 50% of your time helping students develop High Order Processes.

It is now the end of the semester, and you are developing your Final Exam.

In general, what mixture of assessment techniques should you use to make sure your decisions about how much students have learned throughout your course have *strong* rather than *weak* **content validity**?

Self-Assessment Exercise 9.0

II. You teach a course in *Fashion Design*. One-third of the twelve Learning Objectives you have established for this course relate to students knowing and understanding the basic elements of design. The other two-thirds of the Learning Objectives relate to students using these basic design elements to create their own original work.

It is now three weeks into the course. All of your instructional time with students thus far has been spent helping them achieve the four Learning Objectives related to knowing and understanding basic design elements.

You want to decide how well students are progressing in the course thus far. In general, what kind of assessment technique should you use to make sure your decision has *strong*, rather than *weak*, **content validity**?

When you develop your Final Exam to give students at the end of the course, what mixture of assessment techniques should you use to make sure your decisions about how much students have learned have *strong* rather than *weak* **content validity**?

Focus on Assessment and Reliability

- Reliability: *accuracy* of assessment technique in determining true level of knowledge or skill.

Focus on Assessment and Reliability

- **NO** ASSESSMENT TECHNIQUE IS 100% ACCURATE; **NO** ASSESSMENT TECHNIQUE IS 100% RELIABLE.
- The score you put on top of your student's paper is NEVER student's true score.

Focus on Assessment and Reliability

- All assessment approaches have more or less measurement error; the *more* measurement error, the *less* reliability
- Measurement error happens:
  - every time a student gets a question right when he or she truly doesn't know the answer, or
  - every time a student misses a question when he or she truly does know the right answer

- Link back to Outline Slide Show