Student Assessments: Are We Doing It The Right Way?

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Assessment: A definition

How much students have learned, not how much they know--------
Assessment

Four parts:
1. Clear, measurable, learning objectives

“Critical Thinking”
Objectives

Bloom’s Cognitive Domain Taxonomy

- Knowledge – Information recall

Recognizes all major internal organs of yellow perch (N = XX) listed on handout
Objectives

Bloom’s Cognitive Domain Taxonomy

- Knowledge
- Comprehension – Understand meaning

Predicts which fish belong in the minnow family based on morphological traits found in key
Objectives

Bloom’s Cognitive Domain Taxonomy

• Knowledge
• Comprehension
• Application – use concept in novel situations

Operates safely backpack electrofishing gear in small streams
Objectives

Shouldn’t we have rubber gloves on?
Objectives

Bloom’s Cognitive Domain Taxonomy

- Knowledge
- Comprehension
- Application
- Analysis – Separates material into parts

Compare and contrast morphological traits used to characterize minnow and salmon families
Objectives

Bloom’s Cognitive Domain Taxonomy

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis – Builds a structure or pattern

Modifies electronic settings of electrofishing gear for maximum effectiveness using logical deduction
Objectives

Bloom’s Cognitive Domain Taxonomy

• Knowledge
• Comprehension
• Application
• Analysis
• Synthesis
• Evaluation – Makes judgments

Determine why the “Fishes of Missouri” key works better than the “Fishes of Ohio” key for Indiana fish species ID
Objectives

Bloom’s Cognitive Domain Taxonomy

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

≥70%
Assessment

Four parts:

1. Clear, measurable objectives
2. Communicate these objectives to students
Communication of Objectives

Syllabus
Wrong:
Learn Indiana fish ID

Right:
Recognize 100 Indiana fish species found in the appendix by common and scientific name by sight
Communication of Objectives

Test #1
Wrong:
*Know the fish we covered in lab for the next test*

Right:
*Recognize (N = 52) fish by sight and know common and scientific names in the following families (Centrarchidae, Percidae, etc.) from the class listing*
Communication of Objectives

**Individual lab**

Wrong:

*Learn the fish we have out on the desktops today*

Right:

*Recognize Etheostoma (darters, N = 6 from class listing) by sight and know common and scientific names*
Assessment

Four parts:
1. Clear, measurable objectives
2. Communicate these objectives to students
3. Identify change in student knowledge

Multiple Guess or Essay Test?
Identify change in student knowledge

Student #1 – 95% grade “A”
Student #2 – 80% grade “B”

Which student learned more?

Alewife Alosa pseudoharengus
Identify change in student knowledge

Ichthyology course:

Student #1
• Came in knowing 70 of the 100 fish
• Learned 25 new ones
• Scores 95% on exam
Identify change in student knowledge

Ichthyology course:

Student #2
- Came in knowing 5 of the 100 fish
- Learned 75 new ones
- Scores 80% on exam
Identify change in student knowledge

Pre and post testing:
Large scale
  First day testing
  Final day testing

Small scale
  Beginning of a class
  End of a class
Identify change in student knowledge

What does pre and post testing do?
- Assesses student learning
- Assesses instructor performance
- Points to strengths
- Identifies weaknesses

They aged spines better than otoliths
Assessment

Four parts:
1. Clear, measurable objectives
2. Communicate these objectives to students
3. Identify change in student knowledge
4. Evaluate student attitudes, values, interests
Evaluate student attitudes, values, interests

Not necessarily for current students
Evaluation for instructors and future students
Pre and Post testing
Likert scale
  (1 = strongly disagree, 5 = strongly agree)
Evaluate student attitudes, values, interests

Statement:
Learning common and scientific names for 100 Indiana fish is a reasonable expectation for this class

This statement evaluates the content material
Evaluate student attitudes, values, interests

Statement:
The small group discussions helped in my learning and comprehension of the content material.

This statement addresses pedagogy.
Evaluate student attitudes, values, interests

Statement:
The extra fees needed for the field trips were well worth the money

This statement “values” the cost of the class
Modeling Assessment

What do students know?

What do we want them to learn?

Evaluate the results

Assess the learning
Acknowledgements

Jon Hendrix
Objectives

Recognizes all major internal organs of yellow perch \((N = XX)\) listed on handout

Constructs dichotomous key for \((N = XX)\) local county fish
Objectives

Follow Bloom’s Cognitive Domain Taxonomy

• Knowledge
• Comprehension – Understand meaning

I can spell *Oncorhynchus*, but I can’t remember why minnows are in this genera