MICHIGAN STATE UNIVERSITY College of Education

Assessment Literacy: Supporting Preservice Teachers at MSU

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Plans for Session

- Think-pair-share
- Standards for assessment
- MSU initiatives
- Example of secondary science

Think-Pair-Share

What are the most important things for novice teachers to know and be able to do surrounding issues of assessment?

In Standards and Evaluations

- InTASC calls for improved assessment literacy
  - Standard #6: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making
- Observation Protocols

More Recent Guidelines (Stiggins, 2009)

- Why assess?
  - Assessment processes and results serve clear and appropriate purposes
- Assess what?
  - Assessments reflect clear and valued student learning targets
- Assess how?
  - Learning targets are translated into assessments that yield accurate results
- Communicate how?
  - Assessment results are managed well and communicated effectively
- Involve students how?
  - Students are involved in their own assessment

Updated Standards (Modified from Brookhart, 2011)

- Understand learning in the content area they teach
- Articulate clear learning intentions (standards)
- Communicate what achievement of learning intention looks like
- Be skilled at using range of assessment options
- Analyze existing assessment tasks
- Provide useful feedback on student work

Updated Standards (Modified from Brookhart, 2011)

- Develop scoring schemes that quantify student performance that provide useful information for students, schools, districts…
- Administer external assessment and interpret results
- Articulate interpretation of assessments and reasons for educational decisions
- Help students use assessment information
- Carry out legal and ethical responsibilities

Other competencies

- Be aware of controversies surrounding assessments (e.g., opt out)
- Understand the role of assessment in promoting (and not hindering) equity and social justice

Tensions

- What to teach and what to measure and when
  - Cannot teach it all in pre-service teacher education
  - Cannot wait until the end to measure progress
- Interpretation of standards
- Development of a robust, comprehensive assessment framework

Questions

- What level?
  - What is the appropriate “level” of InTASC for teacher candidates?
  - Our (evidence-based) assumption is that Level 1 is (mostly) the appropriate standards for exiting teacher candidates
- How?
  - How do we support PSTs in reaching that level?
  - How do we measure their progress along the way?

Draft “Learning Progression”

Look at the draft Learning Progression for Standard 6 (assessment):

What do you notice?

Task

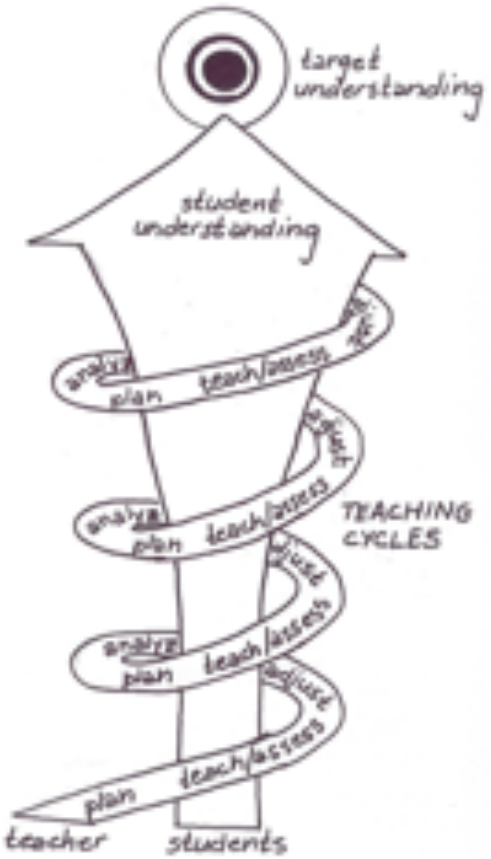
In this task, we will ask you to: 1) review an authentic piece of high school student work given a set of pre-established teacher criteria; 2) provide some feedback; and 3) reflect on the assessment process as you go through it. Or, put another way, we are interested in your ability to take the stance of a learner when evaluating student work. What can you learn about a student from their work? What can you learn about your own teaching practice?

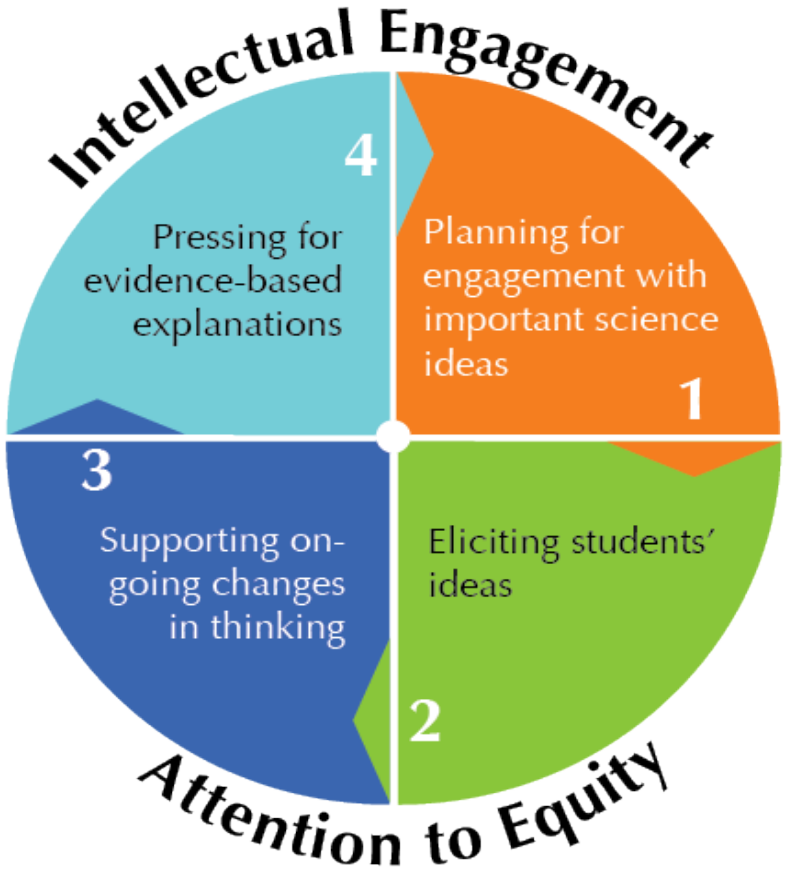
Rubric

Analysis of teacher criteria - Identifies the most important criterion given in the assignment - Evaluates the appropriateness of criteria - Suggests thoughtful changes to criteria	
Analysis of student work in relation to criteria - Analyzes strengths and weaknesses of the student piece - Identifies student misunderstandings - Evaluates whether the student met the teacher criteria - Evaluates whether the student grasps the key concepts	
Student feedback - Of appropriate length - Both constructive and critical - Diagnoses where student is at - Gives future direction to learning	
Summary and Reflection - Provides explanation of own thought processes - Reflects on what was learned about the student, him/herself as an instructor, and the assignment/criteria	

Secondary Science Methods

Informal formative assessment | Formal formative assessment (e.g., curriculum embedded) | Classroom summative assessment | Interim benchmark assessment | Large-scale assessment

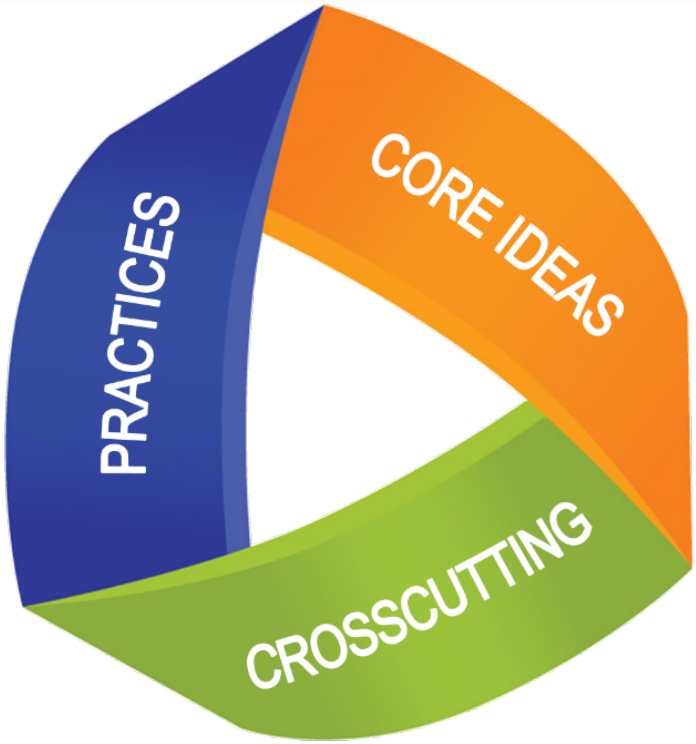




Planning

New Michigan Science Standards

- *Understand learning in the content area they teach*
- *Articulate clear learning intentions (standards)*
- *Communicate what achievement of learning intention looks like*



Eliciting Students' Ideas & Supporting Ongoing Learning

- *Be skilled at using range of assessment options*
- *Analyze existing assessment tasks*
- *Provide useful feedback on student work*

Eliciting Students' Ideas

- Model instructional techniques (including questioning strategies)
- Clinical interviews
- Peer & small group teaching
- Whole class teaching

- Resources…

What's in the Bubbles?

Hannah is boiling water in a glass tea kettle. She notices bubbles forming on the bottom of the kettle that rise to the top and wonders what is in the bubbles. She asks her family what they think, and this is what they say:

Dad: "They are bubbles of heat."

Calvin: "The bubbles are filled with air."

Grandma: "The bubbles are an invisible form of water."

Mom: "The bubbles are empty—there is nothing inside them."

Lucy: "The bubbles contain oxygen and hydrogen that separated from the water."

Which person do you most agree with and why? Explain your thinking.

Purpose

The purpose of this assessment probe is to elicit students' ideas about particles during a change in state. The probe is designed to find out if students recognize that the bubbles formed when water boils are the result of liquid water changing into water vapor.

Related Concepts

atoms or molecules, boiling and boiling point, change in state, energy

Explanation

The best response is Grandma's: The bubbles are an invisible form of water. This invisible water is called water vapor, a gaseous form of water that is not visible; it is unlike steam, which contains some condensed liquid water. When water is heated, the energy supplied to the system results in an increase in molecular motion. If enough heat is supplied, the molecules have so much energy that they can no longer remain loosely connected, sliding past one another as they do in a liquid. The energy now allows the attractive forces between water molecules to be overcome, and they form an "invisible" gas in the form of water vapor. Since the molecules in the gas phase are so much farther apart than in the liquid phase, they have a much lower density, are more buoyant (causing them to "bubble up"), and escape into the air. The bubble is the invisible water vapor.

Feedback and Instructional Decisions

- Develop scoring schemes that quantify student performance that provide useful information for students, schools, districts…
  - Rubrics: Beyond “gets-it” or “doesn’t get it”

Rubrics

Teachers' Learning Trajectories Project

Analysis of Student Understanding of Evidence, Claims & Explanations

Dimension	Level 1	Level 2	Level 3
1. Degree to which the student understands the **nature of variance in data**.	○ Student relies on only one trial or one example from the data. ○ Student does not manipulate the data.	○ Student uses multiple trials or multiple examples from the data but does not explicitly identify which trial is which. ○ Student manipulates the data by finding an average/mean but does not explicitly state or identify the values as averages/means.	○ Student uses multiple trials or multiple examples from the data *without prompting*. ○ Student manipulates the data by finding an average/ mean or other measures of central tendency *without prompting*. ○ Student discusses variance, error, and uncertainty in the data.
2. Degree to which the student makes **comparisons among pieces of evidence**.	○ Student uses only one form of evidence. ○ For example: discussion of data in a simple experiment, or discussion of an amino acid sequence in a textbook example.	○ Student *reports* multiple forms of evidence. ○ For example: *reports* data from a complex controlled experiment, or *reports* about human, chimp, and gorilla amino acid sequences from a textbook example.	○ Student *compares* multiple forms of evidence in a sophisticated way and/or considers counterevidence. ○ For example: *compares* findings from complex experiment(s), or *compares* amino acids sequences from humans, chimps, and gorillas from a textbook example.

Instructional Decisions

- Articulate interpretation of assessments and reasons for educational decisions
  - Reflections on assessment tasks
  - What will you do tomorrow?
  - What would you do differently next time?

What are your ideas?

- How can assessment literacy best be provided to pre-service teachers?
- How might colleges of education work together and with our district partners to learn from one another how to provide the needed learning opportunities?

For more information

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