THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON DC

NCELA
National Clearinghouse for
English Language Acquisition and
Language Instruction Educational Programs

presents

Considerations for Meaningful Classroom Assessment of ELs in Math and Science

August 20, 2010

Rebecca Kopriva Ph.D., Wisconsin Center for Educational Research (WCER)

Mari Rasmussen Ph.D., National Clearinghouse for English Language Acquisition (NCELA)

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Welcome

- Welcome to the webinar on "**Considerations for Meaningful Classroom Assessment of ELs in Math and Science**." Today's webinar is hosted by the National Clearinghouse for English Language Acquisition, NCELA, located at the Graduate School of Education and Human Development at The George Washington University, funded through a contract with the U.S. Department of Education's Office of English Language Acquisition.

- NCELA's mission is to provide technical assistance information to state and local educational agencies on issues pertaining to English language learners.

- My name is Kathia Flemens, Ph.D., a Research Associate at NCELA and your webinar facilitator.

Note: The contents of this webinar, including information or handouts, do not necessarily reflect the views or policies of the Department of Education nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

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Our Presenters:

Dr. Mari Rasmussen currently works at NCELA with outreach to state education agencies (SEA). Dr. Rasmussen has had extensive experience working with the assessment of ELs at the classroom levels, state level and regional level.

&

Dr. Kopriva a Senior Scientist at the Wisconsin Center for Educational Research (WCER) at the University of Wisconsin-Madison, author of the 2008 book *Improving Testing for English Language Learners: A Comprehensive Approach to Designing, Building, Implementing, and Interpreting Academic Tests*, and lead designer of the ONPAR assessments.
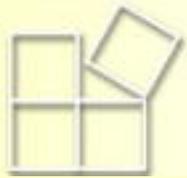
Considerations for Meaningful Classroom Assessment of ELs in Math and Science: a Title III State Education Agency (SEA) perspective

Mari Rasmussen

National Clearinghouse for English Language Acquisition (NCELA) at George Washington University

mbjr@gwu.edu
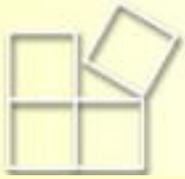
Classroom Assessment for ELs from a Title III State Education Agency (SEA) perspective

- Title I and Title III of Elementary and Secondary Education Act require participation by ELs in state accountability systems
  - State content assessments
  - State English language proficiency assessments
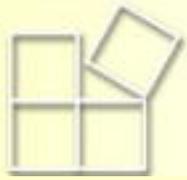
Classroom assessment does not replace state assessments for ELP and content….

- *But, it can…*
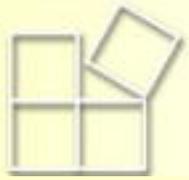
Enhance

the state system
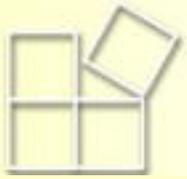
Title I and Title III personnel at the state level can look for the use of classroom assessment in the following areas:

- Inclusion in consolidated applications for Title I and Title III funding,
- Included in professional development plans for federal and state funding,
- Inclusion in program improvement plans.
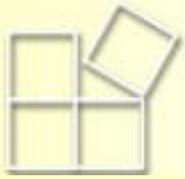
Considerations for Meaningful Classroom Assessment of ELs in Math and Science:

What to Consider and How to Do It
Part 1:

Rebecca Kopriva
University of Wisconsin
rkopriva@wisc.edu
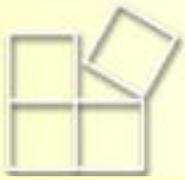
Content Teachers and EL Specialists

- EL specialists may or may not teach academic content to EL students.

- Often, mainstream content teachers will teach math and science to EL students. While EL specialists may focus mostly on teaching English language acquisition, content teachers WILL look to them to help with how to effectively teach content.

- Lately, many EL specialists have been encouraged to work with mainstream teachers to help them teach academic English while they teach content.

- Beyond this role, however, is a vast repertoire of skills that ELL specialists have. These involve a) knowing how to *HEAR* their students, and b) how to *SUPPORT* language with other semiotic representations. These skills *CAN AND SHOULD* be taught to mainstream teachers.

- Whether teaching content or supporting mainstream teachers, the following slides will outline the kinds of steps to take to make sure ELs have the opportunities to learn the content of math, science and other subject areas.
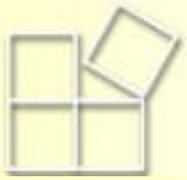
I. What You Need to Consider Before You Start

1. Planning Is Key

Effective assessment is about knowing *specifically* what you want students to learn FROM EACH CLASS, and then learning what students are hearing.

BEFORE beginning a unit this means:

- Planning ongoing integration of assessment opportunities into learning activities.

- Evaluating the value of any existing commercially developed assessments.

- Knowing what prior knowledge students bring.

- Listing what you expect to hear and see while a task is performed and a concept is addressed. What do you want the student to get out of the lesson?

- Designing assessment tasks that address the elements just listed above *as well as* pick up where students are having problems and why.
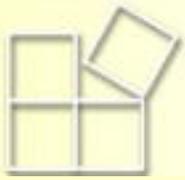
I. What You Need to Consider Before You Start

2. Plan to Teach and Assess the Full Range of Content Complexity

- Often we hear: "Just because an EL child doesn't speak much English doesn't mean she is not thinking in complex ways".

- However, it is easy to fall short in providing learning opportunities in the classrooms for ELs to engage in and communicate complex thinking, and using assessment tasks that provide information about these skills.

- Learning tasks need to involve not just factual learning but opportunities to identify relationships, compare and contrast, synthesize, generalize and predict.

- They also need to utilize a variety of participatory structures and opportunities to engage in dialogue and self analysis.

- Assessments of student learning during tasks such as these evaluate students acquisition of these skills.
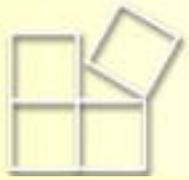
I. What You Need to Consider Before You Start

3. Plan for Diversity

Lesson and assessment planning that consider how the students will hear the material and the questions and evaluation response criteria that guide thinking about what the students mean when they respond in particular ways should prove to be more useful in sustaining learning. Considerations include:

- how students' different cultural backgrounds affect how they interpret what is being taught
- the experiential knowledge associated with the lessons that the students bring into the classroom
- the tools for delivery
- the process and participatory structures for classroom interaction that best match students' socialization
- learning styles
- student input.
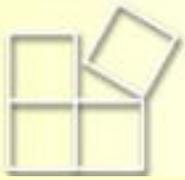
I. What You Need to Consider Before You Start

4. A Note about Teacher Knowledge

- A teacher's own expertise and her ability to understand the information being taught has a substantial impact on her ability to effectively and flexibly communicate with her students.

- When teachers know the content deeply they can map their expectations backwards and break down the cognitive demand into smaller 'chunks' of information. When teachers are not as confident about their content knowledge they tend to depend solely on textbooks or materials not critically reviewed. Instruction is often weakened.

- The same is true for assessments. Good assessment integrates many 'mini-feedback loops' into instructional tasks. Knowing that students communicate in varied ways and that various levels of cognitive complexity are often communicated differently, teachers have and use a LARGE REPETOIRE of practices when they assess their students. Planning therefore should integrate these procedures and expect to use a range of practices and tasks to assess their ELs.
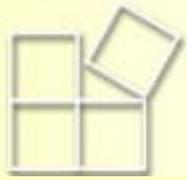
II. The Nuts and Bolts of an Effective Academic Assessment Program

1. What does an Effective Program Look Like?

- Assessment opportunities should be EXPLICITLY and PURPOSEFULLY considered and developed as part of the planning process.

- Informal and formal formative opportunities should evaluate learning of the FULL RANGE of concepts and skills.

- Opportunities should be integrated FREQUENTLY into ongoing instruction, during and between lessons .

- Teachers should BE FAMILIAR with students' prior knowledge and their communication strengths and challenges and ADJUST accordingly.

- Teachers should be able to SPOT pitfalls and common mistakes, EVALUATE RESPONSES, and ADJUST as they go in order to ADAPT instruction and assessment plans.

2. Know What You Want to Assess

- In deciding what you want to assess, focus on the cognitive knowledge and skills the instruction is supposed to teach.

- Identify the specific types of knowledge and skills.

- It is rather secondary whether the questions or techniques come from published materials or are built by you.
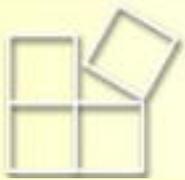
2. Know What You Want to Assess(cont)

- A recent taxonomy from Ruiz-Primo, Li, & Shavelson (2007) specifies 4 types of knowledge and/or skills:

  - ➤ *'Knowing That'*: Declarative knowledge includes scientific facts, terms, and definitions that can be learned and held in memory as words, pictures, or sensory representations. It can also include statements of fact, such as "CO2 is carbon dioxide."

  - ➤ *'Knowing How'*: Procedural knowledge and skills entails if-then rules or sequences of steps such as in algorithms. Examples include reading data tables or designing experiments. A central ingredient of procedural knowledge is that, with practice, individuals can convert it into automatic responses.

  - ➤ *'Knowing Why'*: Schematic knowledge typically involves the application of scientific principles or explanatory models and knowledge that guides actions, troubleshoots systems, or predicts the effect of changes. For instance, it can include explaining why the moon generally rises about 50 minutes later each day or how a particular virus functions.

  - ➤ *'Knowing When, Where, and How* to apply knowledge': Strategies include using skills to represent problems or deal with certain tasks, general monitoring abilities, or planning strategies such as dividing a task into subtasks or integrating types of knowledge.
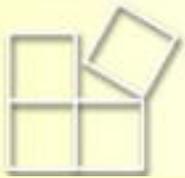
3. Identify Targeted Depth of Knowledge or Skills.

For instance:

- Lower levels of cognition include recalling facts, lists, or definitions, and identifying or recognizing appropriate content information.

- Middle levels introduce abstract thinking abilities, such as categorizing, organizing, analyzing, relating information using a relatively limited amount of phenomena, and solving problems with more than one, but relatively few, steps.

- The higher levels of cognitive learning poses more complex problems, where students need to organize and carry though a multi-step plan, juggle a wider range of information, know how to distinguish relevant from irrelevant concepts and strategies, and when and how to use relevant information in a complex coherent way. As an example, this kind of thinking could call for using information from multiple conceptual systems, synthesizing, or interpolating.
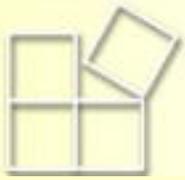
4. Think about What Procedures or Task Types to Use

Formal and informal evaluation opportunities include tasks such as:

- Fill in the blanks, true false, multiple choice and short answer types of questions

- Longer (e.g15-minute) essay type questions (including diagrams, pictures, etc) that ask for descriptions, explanations, arguments

- Extended performance tasks that engage students in designing, conducting, interpreting, and reporting the results of investigations, projects, or experiments, including making decisions about what strategies, knowledge or functions to use when, and for what purpose.

- Observation protocols that capture situations such as limited or ongoing discourse involving other students or the teacher. Results would be coded or otherwise captured according to pre-determined schemes and then evaluated according to pre-determined 'scoring' criteria (similar to rubrics).
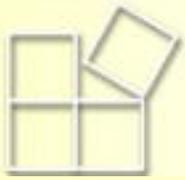
5. Figuring Out What to Use When

What the last three points do *not* tell you is how all of this goes together. What is important is that the intended knowledge/skills are matched by a type of assessment task that can properly elicit this kind of information.

In general, the deeper the depth of knowledge that is targeted by aspects of the instructional lesson the more extensive and multi-faceted the assessment task. This often means:

- Pieces of declarative knowledge at lower levels of cognition can often be reasonably assessed using formats asking for a word or short phrases, or selecting among related choices.

- Concepts related to declarative knowledge might be best assessed using open-response explanations, including explanations involving differentiations between what the concept includes and what it doesn't. Often the concepts involve abstract thinking and making judgments.
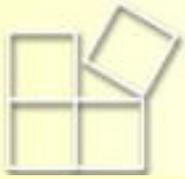
5. Figuring Out What to Use When (cont)

- Simpler types of procedural knowledge and skills such as reading figures or sorting a limited set of elements can be assessed in a variety of ways including close-ended formats.

- More complex procedures involving making choices or judgments, or procedures that have more possible variations are usually considered more cognitively complex. Open response opportunities that allow for procedures to be shown, or demonstration of procedures during the execution of a task, experiment, or situations such as during a debate are examples of how these skills might be assessed.

- More straightforward or constrained kinds of schematic knowledge or skills, such as that seen in a 2-step application problem can be assessed by multiple-choice or other short response opportunities.
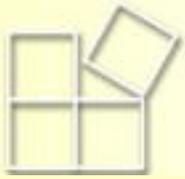
- More complex applications that involve using or choosing among multiple schemas or adapting to new constraints or possibilities can be best assessed by demonstration, model-building, explanations involving the clarification of relationships, or meta-cognitive explanations.

- Likewise, strategies span the range of cognitive complexity and assessment opportunities should be able to reflect the level of mastery of the intended skill(s).
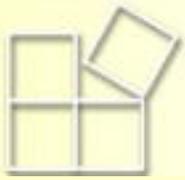
6. For example:

- Say you are interested in assessing how well students can reason using models…

- Option 1: You can build or find a close-ended question that allows students to 'select all that apply' of several options, as long as the options have been purposefully placed in the item to provide various kinds of partial information. Only certain combinations of selected responses would receive full credit, but partial credit could be given if the student selected certain other types of combinations. The American Association of the Advancement of Science has a large-pool of available items like these. This option, though, is likely to be language intensive unless options are graphic in nature or can be edited and read orally to students (in English and/or in L1).

- Option 2: You can also build an open-ended question that requires students to show you their reasoning by drawing diagrams.

- In some cases, diagrams may need to have some reasoning language associated with them; in other cases they wouldn't.
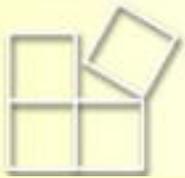
6. For Example (cont.)

- If language is still needed, teachers of ELs need to think about how they can support their students in explaining themselves. For instance:
  - ➤ teachers may be able to read the students' code-switching explanations
  - ➤ they may need these students to orally explain their diagrams until the teacher is satisfied
  - ➤ the teachers can ask the students to respond to other questions to see if the student has a firm grasp on the targeted reasoning the teacher is focusing on.
- What the properly constructed multi-option question or the open-ended response question have in common is they are designed to evaluate the student's grasp of reasoning skills associated with evaluating models.
  - ➤ In the first case the evaluation of the reasoning skills occur because of the proper combination of options the student selects.
  - ➤ In the second case the student demonstrates their skills pictorially and defends it as needed with appropriate language support.
- In each case, what would *not* be acceptable is a fact-finding, simple multiple-choice or true/false question. This is because these types of questions do not properly measure the intended skill.
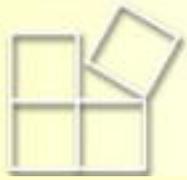
Summary of Webinar Issues
From State Perspective

- Importance of collaboration in assessment for ELLs
  - Consistent with federal policy
  - Consistent with best practices
  - Consistent with research
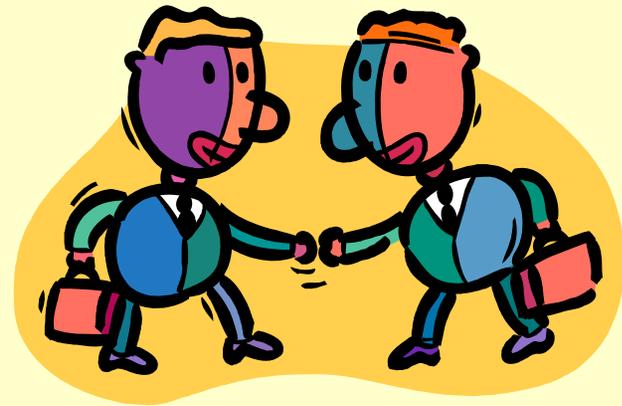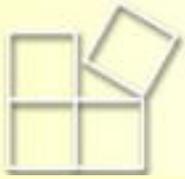
Feedback

We would like to hear from you!

We encourage everyone participating in the webinar to please submit your concerns and questions. The presentation today provided the set up for and examples of how to use the underpinnings described in this webinar in order to effectively measure rigorous academic content knowledge of English language learners. We look forward to further discussing this topic with more of an SEA focus.
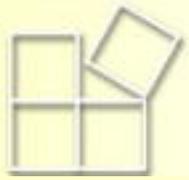
? Questions ?

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• For more information or if you have additional questions contact:
  Rebecca Kopriva, Ph.D. at rkopriva@wisc.edu
  Mari Rasmussen, Ph.D. at mbjr@gwu.edu
                    or
• If you have additional questions regarding the webinar contact Kathia Flemens, Ph.D. at kflemens@gwu.edu.

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Thank you