CAREER: MATHEMATICS INSTRUCTION FOR ENGLISH LANGUAGE LEARNERS

OBSERVATIONAL RUBRIC

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Quality of Linguistically Diverse Teaching (adapted from Chval & Chavez 2011)

This dimension attempts to capture evidence of quality of teaching strategies offered in a linguistically diverse classroom (either in multilingual or mainstream classrooms). The different elements of this rubric are based on research conducted on ELLs up to this point.

1. Connections of mathematics with students' life experiences and prior knowledge

This code captures instances by which the teacher activates students' prior mathematical knowledge by explicitly referencing skills learned in a previous lesson or grade. This code includes references by the teacher to mathematics found in daily life by students such as money and shopping.

Not Present	Low	Mid	High
No connections of mathematics to students' life experience and prior knowledge are made. OR The connections made by either teacher or students are confusing or incorrect.	Either the teacher or students make brief mention of connections of mathematics to students' previous knowledge and experience to clarify a concept or procedure. OR Frequent connections of mathematics and students' prior knowledge and experience are made, but used exclusively to illustrate procedures. OR Some connections made by either teacher or students are incorrect.	Frequent connections of mathematics and students' prior knowledge and experience are made, sometimes with the purpose of clarifying concepts, but mostly to illustrate procedures.	There is a substantial discussion involving connections of mathematical concepts to students' prior knowledge and life experience.

2. Connections of mathematics with language

Connect language with mathematical representations such as pictures, tables, graphs, and mathematical symbols. This code captures the extent to which the teacher reinforces a mathematical representation with its meaning.

This code is different than Links between representations in the sense that there is only the link between mathematical words to other representations.

Not Present	Low	Mid	High
No connections of mathematical utterances to mathematical representations are found.	The teacher or students make explicit connections of mathematical words and mathematical representations, but these connections are verbal and brief. OR There is one written connection between a	The teacher or students make verbal connections of mathematical words to mathematical representations, and these connections are reinforced by repetition. OR There are two written connections between one or two mathematical	The teacher or students make multiple written connections of mathematical words to mathematical representations.

	mathematical term and a representation.	terms and one or two representations.	

3. Meaning and multiple meanings of words Teacher or students communicate meaning by using synonyms, gestures, drawings, cognates, or translations to students' first language that supports the learning. This code includes reading strategies meant to increase comprehension. Meaning that occurs between students that is correct can adjust the score upward.			
Not Present	**Low**	**Mid**	**High**
No opportunities for students to explore the meaning of the mathematical words through speech and other forms of expression are found. OR The translation/meaning of mathematical terms is incorrect, or the use of gestures to convey meaning is confusing.	Brief opportunities for students to explore the meaning of mathematical words and objects through speech and other forms of expression are found. Examples: • Correct translation and support of math terms. • Use of gestures to convey meaning, e.g., pointing, as when indicating the apex of a pyramid • Use of synonyms • Use of drawings • Use of cognates	The teacher or students engage in a discussion of mathematical words that has the features noted under High, but they occur in an isolated instance, but they do not characterize the segment.	The teacher and students explore the meaning of the mathematical words and objects through speech and other forms of expression in an extended way. Examples are: • A conversation about the multiple meanings of mathematical words (mathematical meanings and/or colloquial meanings). • Emphasis on cognates • Use of a combination of techniques such as gestures, drawings, and the use of synonyms to convey meaning.

4. Use of visual support For example, concrete objects, videos, and illustrations in classroom conversations. Concrete objects may include time tables, formula charts, protractors, 2D models, or dynamic foldables. This code does not include the visual support of the blackboard. Any visual support needs to add to the static nature of the blackboard.			
Not Present	**Low**	**Mid**	**High**
The teacher makes no attempt to convey mathematical meaning through visual supports, or an attempt is made, yet it obscures, rather than enhances, mathematical understanding.	An attempt to teach or reinforce teaching through usage of visual supports is made. The visual support is brief or focus briefly on meaning.	The visual object(s) selected, or the instructional usage of the object(s), is(are) moderately helpful for solidifying (several instances within a segment or one somewhat long instance, but this illustration is not sustained or substantial) students' comprehension. They support the sense-making elements.	Teacher supplements instruction with powerful visual media that enhance (not detract from) comprehension of mathematical concepts. The emphasis is on the power of the visual object in conveying or reinforcing the mathematical explanations and reasoning.

5. Record of written essential ideas, concepts, representations, and/or words on the board ELLs need to see written record of the lesson without erasing so that they can refer to them throughout the lesson. The score may be adjusted downward if some important/essential information is never recorded.			
Not Present	**Low**	**Mid**	**High**
The teacher (and/or students) fail to record the important information of the lesson in a place that is visible to all students, or removes the information from view at a time when it is most needed.	The teacher (and/or students) displays briefly the important information of the segment, or removes almost all portions of the information from view before students have had opportunity to record it in notes or apply it in practice.	The teacher (and/or students) displays some, but not all of, the important information of the segment, or removes some portion of the information from view before students have had opportunity to record it in notes or apply it in practice.	The teacher (and/or students) makes careful and conscientious usage of visual display media (chalk/dry-erase board, computer projection, etc.) and students have access to pertinent information throughout instruction and practice portions of the segment.

6. Discussion of students' mathematical works This is similar to the code "Teacher uses student mathematical contributions", but only applies to students' written work.			
Not Present	**Low**	**Mid**	**High**
Teacher makes no usage of students' mathematical works for instructional purposes, e.g., teacher circulates the classroom just checking on student progress. OR Usage of students' work obscures learning.	The teacher and/or students make use of students' mathematical works publicly, but in a pro forma way, e.g., a student solves a problem on the board that does not elicit further discussion. OR The teacher engages one or two students in a private discussion of their written work.	The teacher and/or students openly discuss students' mathematical works to some degree in the development of the mathematics. Teacher may engage in features listed under High briefly, but instruction general proceeds without strong use of students' work. OR The teacher engages three or more students in a private discussion of their written work.	Students' works are woven at length into the development of the mathematical idea during the segment. Teacher makes explicit instructional usage of students' mathematical works through: class discussion of correctness/meaning of student writing, distribution of teacher-annotated student work. Examples include, Students engaging in substantive talk after a peer presents his/her work on the board or groups of students engaging in substantive discussion about their written work.