



Diagnostic Assessment Results: Instructional Uses and Potential Pitfalls

Amy Clark & Neal Kingston

Large-Scale Assessment Context

- Summative results serve specific purposes
 - Inclusion in state accountability metrics
 - Program evaluation
 - Resource allocation
- Less emphasis on use in classrooms to inform learning

Challenges to Instructional Use of Large-Scale Assessment Results

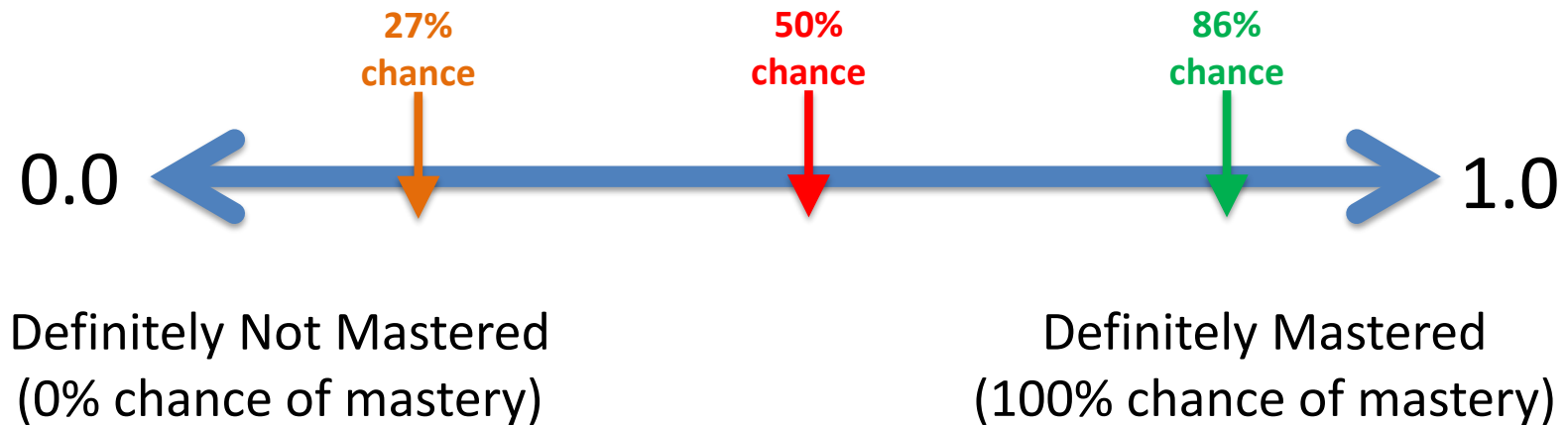
- Typically created for summative purposes
- Results are useful for reporting aggregated results, but less so for instructional practice
- Score reports are often delivered after the conclusion of the academic year
 - Students advance a grade and are taught the new grade's academic content standards

Diagnostic Assessments

- Measure discrete latent traits or “skills”
- Scored using diagnostic modeling to produce mastery information for each skill rather than a raw or scaled score value
 - Probabilistic models determine skill mastery
 - Item responses used to determine likelihood student mastered each skill
- Results summarized in a mastery profile

Skill Mastery

The statistical model tells us the probability that the student is a master. Values near .5 represent the point of maximum uncertainty.



Scoring and Reporting Considerations

- Representing mastery and certainty
 - Raw probability values or dichotomous mastery status
 - Consider audience interpretation
- Aggregation of fine-grained information in the subject for accountability purposes
 - Standard setting to distinguish performance levels
- Resources to support interpretation

Purpose

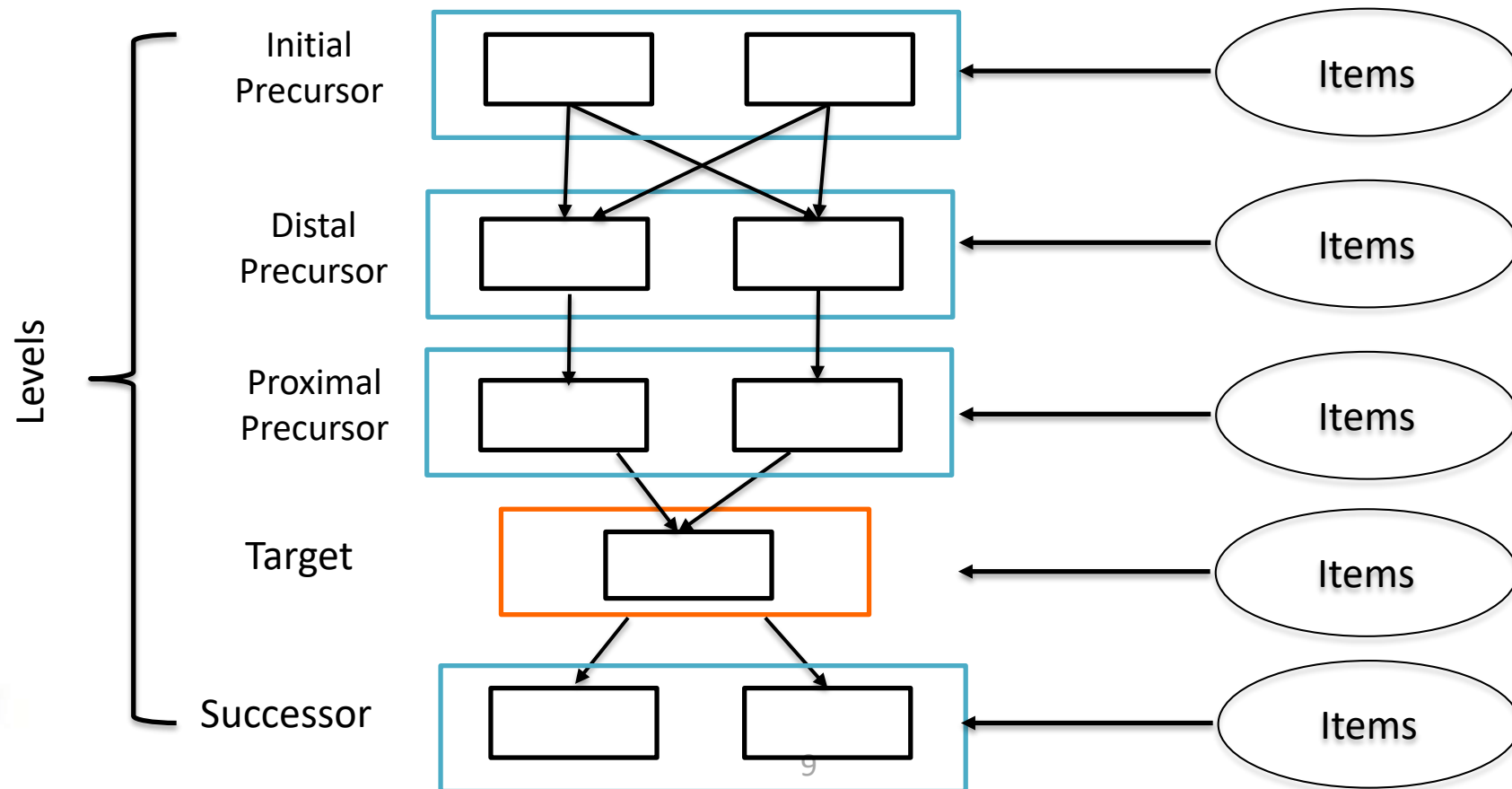
- Limited evidence to date for how teachers use fine-grained mastery information from diagnostic assessments to inform instruction
- Goal: highlight promises and pitfalls for diagnostic reporting
 - Sharing findings in context of large-scale diagnostic alternate assessment system

DLM Assessment Reporting

- Calibrated and scored using a diagnostic model
 - Latent class analysis to determine skill mastery
- Report dichotomous mastery status based on mastery threshold
- Two levels of score reporting:
 - Fine-grained skill mastery in **Learning Profile**
 - Subject summary information in **Performance Profile**

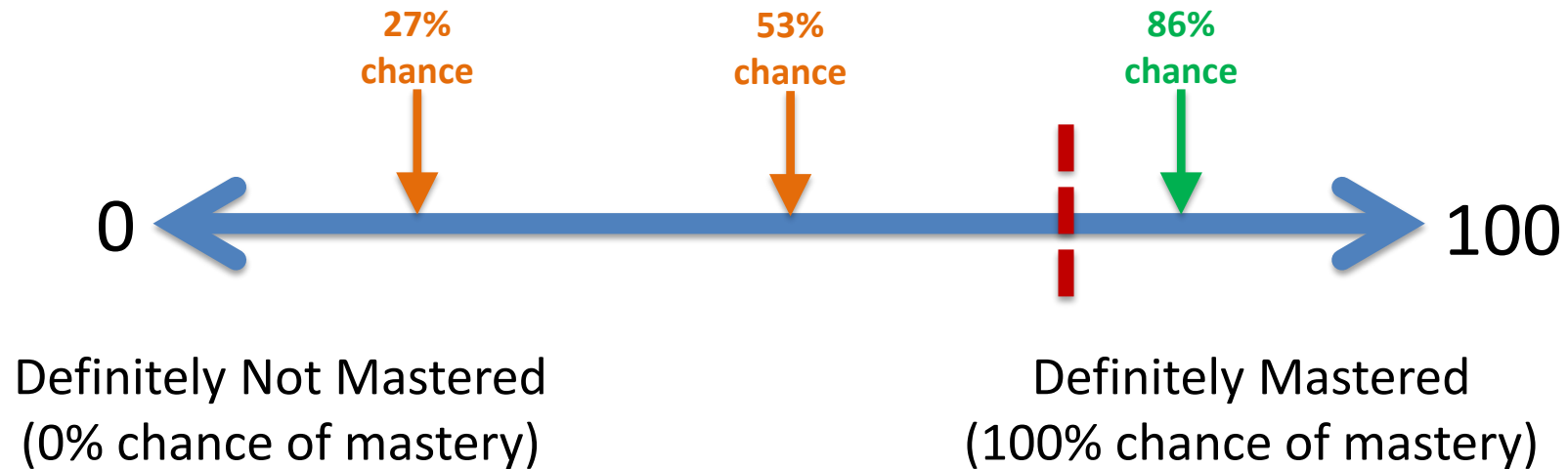
Content Measured

For each content standard, five skills or linkage levels measure an underlying map structure



Linkage Level Mastery

- For DLM assessments, the student must have a 0.8 or greater probability of mastery to be considered a master
 - Value further from maximum uncertainty while also allowing for some variation in responses



REPORT DATE: 06-06-2018
 SUBJECT: English language arts
 GRADE: 10

Individual Student Year-End Report Learning Profile 2017-18



DISTRICT ID: DLM District
 STATE: DLM State

NAME: Student DLM
 DISTRICT: DLM District ID
 SCHOOL: DLM School

Student's performance in 10th grade English language arts Essential Elements is summarized below. This information is based on all of the DLM tests Student took during the 2017-18 school year. Grade 10 had 19 Essential Elements in 4 Conceptual Areas available for instruction during the 2017-18 school year. The minimum required number of Essential Elements for testing in 10th grade was 10. Student was tested on 17 Essential Elements in 4 of the 4 Conceptual Areas.

In order to master an Essential Element, a student must master a series of skills leading up to the specific skill identified in the Essential Element. This table describes what skills your child demonstrated in the assessment and how those skills compare to grade level expectations.

		Level Mastery				
Area	Essential Element	1	2	3	4 (Target)	5
ELA.C1.2	ELA.L.9-10.4.a	Identify familiar objects through property word descriptors	Identify definition of words	Identify missing words using sentence context	Use semantic clues to identify word meaning	Use semantic clues to identify phrase meaning
ELA.C1.2	ELA.L.9-10.5.b	Draw conclusions from category knowledge	Identify the multiple meanings of a word	Identify word meaning of multiple meaning words using context clues	Identify the intended meaning of multiple meaning words	Understand how multiple meaning words can result in humor
ELA.C1.2	ELA.RI.9-10.1	Identify concrete details in a familiar informational text	Identify concrete details in an informational text	Cite textual evidence for inferred information	Discriminate between citations for explicit and inferred information	Cite evidence for a text's specific meaning

Levels mastered this year
No evidence of mastery on this Essential Element
Essential Element not tested

REPORT DATE: 06-06-2018
SUBJECT: English language arts
GRADE: 10

Individual Student Year-End Report
Performance Profile 2017-18

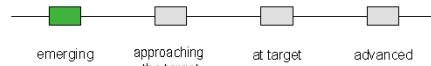


NAME: Student DLM
DISTRICT: DLM District
SCHOOL: DLM School

DISTRICT ID: DLM District ID
STATE: DLM State

Overall Results

Students in Grade 10 English language arts are expected to be administered assessments covering 50 skills for 10 Essential Elements. Student mastered 17 skills during the year. Overall, Student's mastery of English language arts fell into the first of four performance categories: **emerging**. The specific skills Student has and has not mastered can be found in Student's Learning Profile.



EMERGING:	The student demonstrates emerging understanding of and ability to apply content knowledge and skills represented by the Essential Elements.
APPROACHING THE TARGET:	The student's understanding of and ability to apply targeted content knowledge and skills represented by the Essential Elements is approaching the target .
AT TARGET:	The student's understanding of and ability to apply content knowledge and skills represented by the Essential Elements is at target .
ADVANCED:	The student demonstrates advanced understanding of and ability to apply targeted content knowledge and skills represented by the Essential Elements.

A student who achieves at the **emerging** performance level typically can identify objects associated with a text, identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.

The student identifies objects associated with a text by:

- using property words to identify familiar objects
- identifying objects within a category
- understanding subgroups of objects within a category

The student identifies text elements by:

- identifying details in a familiar text

REPORT DATE: 06-06-2018
SUBJECT: English language arts
GRADE: 10

Individual Student Year-End Report
Performance Profile 2017-18

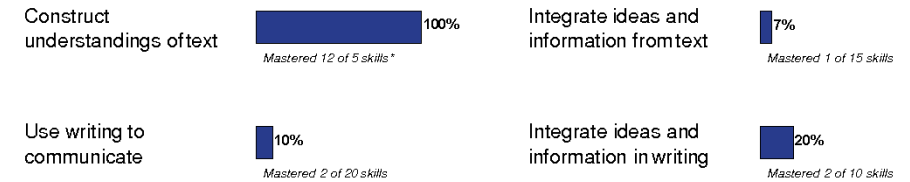


NAME: Student DLM
DISTRICT: DLM District
SCHOOL: DLM School

DISTRICT ID: DLM District ID
STATE: DLM State

Performance Profile, continued

Conceptual Area



*Student took more assessments and demonstrated mastery of skills beyond what was required during the year.

More information about Student's performance on each Essential Element that make up the Conceptual Areas is located in the Learning Profile.

Subject Performance Summary

Decisions for how to aggregate subject performance

- Summarize percentage of skills mastered for collections of related standards
 - Same “conceptual areas” or strands across grades
- Standard setting process to delineate performance levels
 - e.g., using total skills mastered

Promises

Identified areas of promise for using diagnostic score reports

- Fine-grained information useful for instructional planning
- Summary information useful for describing overall performance

Using Mastery Information

- Using fine-grained mastery to plan instruction on similar standards in subsequent grade
 - Prioritizing depth versus breadth
- Identify instructional groupings for students working on similar skills
- Progression of skills supports IEP goal development and instruction toward grade-level target

Aggregated Information

- Using conceptual area bar charts showing percent of skills mastered to more generally plan instruction for collections of related content standards
 - Combine with results from other assessments
- Describing overall performance in the subject with parents and other teachers

Potential Pitfalls

Teachers' prior conceptions of mastery may influence interpretation

- Percent of items answered correctly
- Percent of trials student demonstrated behavior

Teachers not questioning certainty of mastery information

Potential Pitfalls

- Because of differences from traditional assessments, teachers desire more training and resources to support interpretation and use of results
- Challenges understanding how overall performance in the subject was determined
 - Descriptions of scoring process as a “black box” or wondering if results were a “lucky guess”

Potential Pitfalls

- Differences in instructional utility by grade level
- For elementary and middle school teachers, whose students take assessments annually, fine-grained reports are more useful for instructional decision-making
- For high school teachers, particularly for 11th grade teachers whose students are last assessed in 8th grade, fine-grained results may be less useful

Key Findings

- Fine-grained results useful for instructional practice, even in subsequent academic year when student is being instructed on next grade-level standards
- Teacher conceptions of mastery may influence their interpretation and use
- Teachers' desire for more information on how results are determined and how to effectively use them to inform instructional planning