Overview of The Dynamic Learning Maps Alternate Assessment System

Neal Kingston

August 7, 2014
DLM State Membership Map and Portion of Mathematics Learning Map
# Sample Progress Report

**Yellow** = current instructional focus  
**Green** = mastered skills

<table>
<thead>
<tr>
<th>Area</th>
<th>Instructional Target</th>
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<th>2</th>
<th>3</th>
<th>4 (Target)</th>
<th>5</th>
</tr>
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<td>Differentiate between text and pictures</td>
<td>Identify details and beginning and end of a story</td>
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<td></td>
</tr>
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What are the key features of DLM?

- Instructionally-embedded assessments
- Instructionally relevant testlets
- Fine-grained learning maps
- A subset of particularly important nodes that serve as content standards - Essential Elements
- Accessibility and alternate pathways
- Dynamic assessment
- Status and growth reporting that is readily actionable
- Professional development
- A technology platform to tie it all together
Why instructionally embedded?

• Assessment is most useful when it is designed to help teachers help students learn!
  – Better to modify the assessment than modify the instruction
  – 1 task every other week for 30 weeks = about 60 items (Compared to a typical summative alternate assessment with perhaps 30 items)
  – Observe growth
What is instructional relevance?

• Instructionally Relevant Testlet
  – Reflects best instructional practice
  – Provides useful examples
  – Promotes the content standard being measured
  – Tests for common misunderstandings
  – Results inform instruction

• Guiding principle - activities teachers would want to use for purely instructional reasons!
THE LEARNING MAP
A Portion of the Math Map
Quick Facts about the Map

- **ELA**
  - 141 foundational nodes
  - 1,645 ELA nodes
    - 538 Essential Elements
  - 3,982 edges/connections

- **Mathematics**
  - 141 foundational nodes
  - 2,312 mathematics nodes
    - 172 Essential Elements
  - 4,838 edges/connections
Learning Map

Claims

Conceptual Areas

Essential Elements

(and other nodes)
DLM Claims

English Language Arts - Claim 1

*Students will comprehend text in increasingly complex ways*

Mathematics - Claim 1

*Students will demonstrate increasingly complex understanding of number sense.*
Conceptual Areas

• Comprised of nodes that represent the development of related skills and processes in the learning map
  – nodes that have been identified as the target for an Essential Element
  – nodes preceding and extending beyond the targets
## English Language Arts

<table>
<thead>
<tr>
<th>Major Claims</th>
<th>Conceptual Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students can comprehend text in increasingly complex ways</td>
<td>Determining critical elements of text</td>
</tr>
<tr>
<td></td>
<td>Constructing understandings of text</td>
</tr>
<tr>
<td></td>
<td>Integrating ideas and information from text</td>
</tr>
<tr>
<td>Students can produce writing for a range of purposes and audiences</td>
<td>Using writing to communicate</td>
</tr>
<tr>
<td></td>
<td>Integrating ideas and Information in writing</td>
</tr>
<tr>
<td>Students can communicate for a range of purposes and audiences</td>
<td>Using language to communicate with others</td>
</tr>
<tr>
<td></td>
<td>Clarifying and contributing to discussion</td>
</tr>
<tr>
<td>Students can investigate topics and present information</td>
<td>Using sources and information</td>
</tr>
<tr>
<td></td>
<td>Collaborating and presenting ideas</td>
</tr>
</tbody>
</table>
Constructing understandings of text
<table>
<thead>
<tr>
<th>Major Claims</th>
<th>Conceptual Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students demonstrate increasingly complex understanding of number sense.</td>
<td>Understand number structures (counting, place value, fraction)</td>
</tr>
<tr>
<td></td>
<td>Compare, compose, and decompose numbers and sets</td>
</tr>
<tr>
<td></td>
<td>Calculate accurately and efficiently using simple arithmetic operations</td>
</tr>
<tr>
<td>Students solve increasingly complex mathematical problems, making productive use of algebra and functions.</td>
<td>Use operations and models to solve problems</td>
</tr>
<tr>
<td></td>
<td>Understand patterns and functional thinking</td>
</tr>
<tr>
<td>Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.</td>
<td>Understand and use geometric properties of two- and three-dimensional shapes</td>
</tr>
<tr>
<td></td>
<td>Solve problems involving area, perimeter, and volume</td>
</tr>
<tr>
<td>Students demonstrate Increasingly complex understanding of measurement, data, and analytic procedures.</td>
<td>Understand and use measurement principles and units of measure</td>
</tr>
<tr>
<td></td>
<td>Represent and interpret data displays</td>
</tr>
</tbody>
</table>
WHAT ARE ESSENTIAL ELEMENTS?
Definition of Essential Elements

The DLM Essential Elements (EEs) are specific statements of the content and skills that are linked to the Common Core State Standards (CCSS) grade level-specific expectations for students with significant cognitive disabilities.
DLM Essential Elements

• Reduced depth, breadth, complexity
• Provide appropriate level of rigor and challenge
• Focus on the skills (with multiple means of demonstration)
• Are a starting point for defining achievement standards
• Are not functional or pre-K skills or instructional descriptions
Example for English Language Arts

Common Core State Standard

- RL.6.2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

Essential Element

- EE.RL.6.2 Determine the theme or central idea of a familiar story and identify details that relate to it.
Example for Mathematics

Common Core State Standard

• 4.MD.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
  • An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.
  • An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

Essential Element

• EE.4.MD.5. Recognize angles in geometric shapes
HOW DO ESSENTIAL ELEMENTS RELATE TO THE MAP?
Identify two related points the author makes in an informational text
OVERVIEW OF TESTLETS
Testlets in Linkage Levels

Connect the map... ...to the items developed.

Initial Precursor

Distal Precursor

Proximal Precursor

Target

Successors

Testlet a

Testlet b

Testlet c

Testlet d

Testlet e
Feelings of Characters

ELA.EE.RL.3.3 Identify the feelings of the characters in a story.
Fractions
M.EE.3.NF1-3
Differentiate a fractional part from a whole
Structure of a Testlet

• Begins with engagement activity
  – Motivate students
  – Activate prior knowledge
  – Prepare for the cognitive process required in the items

• ELA: Text presented twice; questions embedded and at conclusion on 2nd read

• Math: series of questions or problems related to single topic
SAMPLE ITEMS
Initial Precursor (7th grade)

Educator Directions:

Present the seven cups to the student in a way that captures the student’s attention. For example:

- Draw the student’s attention to the presence of the cups.
- Talk about how cups are used for drinking juice, water, etc.

Once the student has attended to the cups, stack five cups together and leave two cups separated. Indicate to the student that the stacked cups are in a group and the other cups are separate.

On the next screens, you will ask the student some questions about the cups.

EE: Solve multiplication problems with products to 100.

Node: Recognize set/ recognize separate
Educator Directions:

SHOW: the stacked cups.
SAY: “Here are some cups.”

SHOW: the separate cups.
SAY: “Here are some more cups.”

SHOW: the stacked cups and the separate cups.
SAY: “Show me the group of cups.”
Record student response:

- Indicates the group of stacked cups
- Indicates the separate cups
- Indicates one cup or all of the cups
- Attends to other stimuli
- No response
Initial Precursor (4th grade RI)

Educator Directions:

SHOW: one of the familiar, identical objects. Then give the student a moment to explore the object.
SHOW: the other familiar, identical object. Then give the student a moment to explore the object.
SHOW: a new or different object that was not used in the previous item.

Record student response:

- □ Attends longer to the new or different object
- □ Attends equally to all of the objects
- □ Attends only to familiar objects
- □ Attends to other stimuli
- □ No response

EE: Identify one or more reasons supporting a specific point in an informational text.
Node: Recognize different
Target (5th grade RI)

Why do trees need water?
- to grow
- to move
- to stretch

EE & Node: Identify the relationship between a specific point and supporting reasons in an informational text
Target (HS)

Jay counts $1.00. Jay then counts $0.25. What is the total amount Jay counts?

- $0.75
- $1.25
- $1.75

EE: Solve real world problems involving addition and subtraction of decimals and whole numbers, using models when needed.

Node: Solve word problems involving addition with rational numbers
Proximal Precursor (HS)

Deb finds a cylinder. Which shape is a cylinder?

EE: Use properties of geometric shapes to describe real-life objects.

Node: Recognize cylinders
Item Types

- Single-select multiple choice
- Multi-select multiple choice
- Technology enhanced:
  - Sorting
  - Matching
  - Hot text (ELA)
- Teacher observation*
- Extended performance event*
TEST BLUEPRINTS
Blueprints

- Currently under final review by states
- Supporting two models of assessment
Integrated Model

<table>
<thead>
<tr>
<th>August - April*</th>
<th>May*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructionally embedded testlets</td>
<td>Test again on limited sample of EEs from within year</td>
</tr>
<tr>
<td>Teacher/IEP team choice with some constraints</td>
<td></td>
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Summative scores based on combination Testlets are homogeneous

*Approximate. Exact windows TBD
Instructional Tools Interface

4 steps
# Year-End Model

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<th>August - April*</th>
<th>May*</th>
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<tr>
<td>Instructionally embedded testlets by state/teacher choice</td>
<td>Test on full breadth of blueprint</td>
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Summative scores based only on these testlets

*Approximate. Exact windows TBD
Other Work In Progress

• Empirical investigations of the map structure
• Training, communication for 2014-15
• Planning other validity studies
• Additional technology development
  – Accessibility, educator interface
• Score reporting
• Initial steps: science
Accessibility

Accessible Content

Personal Learning Profile

Technology
Personal Learning Profile

Personal Needs and Preferences (PNP)
- Display
- Language & Braille
- Audio & Environment

First Contact
- Communication
- Academics
- Sensory characteristics
- Motor characteristics
- Computer access
Accessible Content

• Testlet levels
• Vocabulary
• Multiple and alternate pathways
• Items tagged
• Item writing guidelines
  – Prior knowledge
Technology for Assessment Delivery

- Special user interface
- Dynamic routing
Other Accessibility Initiatives

Blindness/Visual Impairment

• National Consortium on Deaf-Blindness
• Input from NCDB and state DB projects
• Fall 2013 pilot observations
• B/VI review and revision; special pilot event in May 2014

Assistive Technologies

• ATIA and device compatibility
PROFESSIONAL DEVELOPMENT
The DLM™ System of Professional Development

- Modules in self-directed and facilitated formats
- Virtual Community of Practice
  - http://dlmpd.com/clds
Overview Modules

• Common Core Overview*
• Essential Elements Overview*
• Universal Design for Learning*
• Principles of Effective Instruction in English Language Arts*
• Standards of Mathematics Practice*
• Students with Significant Cognitive Disabilities
Goal: Create a cohesive system that emphasizes cognitive, linguistic, and conceptual development

- **English Language Arts**
  - 22 modules aligned with 4 Claims and 9 Conceptual Areas

- **Mathematics**
  - 19 modules aligned with 4 claims and 9 Conceptual Areas
Goals for Score Reporting

• Scores should convey real meaning to parents
• Information should be actionable by educators and parents
• (And we still need to meet score requirements for accountability)
Score Reporting (Draft)

• Mastery and growth
• On-demand reports by Essential Element
• Reports to help teachers plan instruction
• Year-End Reports - 3 levels of information
Progress Report

- Available when the teacher assesses throughout the year
- Can be produced at any time - not just at the end of a marking period
- Similar to year-end learning profile
### Sample Progress Report

#### Instructional Targets

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**Yellow** = current instructional focus  
**Green** = mastered skills
## Learning Profile

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<td>Determine the beginning, middle, and end of a familiar story</td>
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Shows every Essential Element assessed that year

Shows the levels mastered within each Essential Element and the Target
Performance Profile
Part 1: Overall Results

Individual Student Year-End Report
Performance Profile

NAME: Susie Smith
SUBJECT: English Language Arts
REPORT DATE: 06-10-2015

ID: 08691
YEAR: 2014—15
GRADE: 3

Overall Results

Grade 3 English language arts allows students to show their proficiency in 85 skills related to 17 Essential Elements. Susie has mastered 32 of those 85 skills during the 2014-15 school year. Overall, Susie’s mastery of English language arts fell into the second of five performance categories: partial. The specific skills Susie has and has not mastered can be found in her Learning Profile.

Compared to all students at her grade level who took the DLM assessment, Susie performed better than:

-- % of DLM test takers in the district*
18% of DLM test takers in the state
19% of DLM test takers nationwide

*District percents are only reported for districts with at least 10 students at the appropriate grade level.
Performance Profile
Part 2: Conceptual Areas

- **Determining critical elements of text (CE)**: 43%
  Susie mastered 17 of 40 skills

- **Constructing understandings of text (CU)**: 28%
  Susie mastered 7 of 25 skills

- **Integrating ideas and information from text (IIT)**: 40%
  Susie mastered 4 of 10 skills

- **Using writing to communicate (WC)**: 40%
  Susie mastered 4 of 10 skills
Performance Profile Continued

More information about Susie’s performance on each Essential Element is located in her Learning Profile.

Determining Critical Elements of Text
Susie is interested in shared reading. Susie understands actions that are part of routines familiar to her. Susie understands that words have meanings that relate to people and objects around her. Susie can identify characters’ feelings and illustrations in familiar texts.

Constructing Understandings of Text
Susie has shown that she can identify objects based on words that describe objects. Susie notices new things in her environment. Susie understands some feeling words.
Growth Profile
Part 1: Overall Results

Individual Student Year-End Report
Growth Profile

NAME: Susie Smith
SUBJECT: English Language Arts
REPORT DATE: 06-10-2015

ID: 08691    YEAR: 2014—15
GRADE: 3

Overall Results

Grade 3 English language arts allows students to show growth in 17 Essential Elements. Susie showed expected growth in 11 of 17 (73%) Essential Elements during the 2014-15 school year. Overall, Susie's growth in English language arts this year fell into the fifth of five growth categories: exemplary.

Compared to all students at her grade level who took the DLM assessment, Susie showed more growth than:

-- % of DLM test takers in the district*
79% of DLM test takers in the state
75% of DLM test takers nationwide

* District percent are only reported for districts with at least 10 students at the appropriate grade level.
# Growth Profile

## Part 2: Conceptual Areas

<table>
<thead>
<tr>
<th>Conceptual Areas</th>
<th>Number of Essential Elements for which Susie met or exceeded expected growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining critical elements of text (CE)</td>
<td>5 of 8</td>
</tr>
<tr>
<td>Constructing understandings of text (CU)</td>
<td>2 of 5</td>
</tr>
<tr>
<td>Integrating ideas and information from text (IIT)</td>
<td>2 of 2</td>
</tr>
<tr>
<td>Using writing to communicate (WC)</td>
<td>2 of 2</td>
</tr>
</tbody>
</table>
Visualizing Student Progress
FIELD TESTING
<table>
<thead>
<tr>
<th></th>
<th>FT1</th>
<th>FT2</th>
<th>FT3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>9,615</td>
<td>10,445</td>
<td>9,731</td>
</tr>
<tr>
<td>Teachers</td>
<td>3,288</td>
<td>3,673</td>
<td>3,375</td>
</tr>
<tr>
<td>Districts</td>
<td>608</td>
<td>648</td>
<td>654</td>
</tr>
</tbody>
</table>

About 800 Illinois student participated in each field test. About 250 Illinois teachers from 47 districts.
TEST ADMINISTRATION OBSERVATIONS
Purpose & Background

• Source of validity evidence
  – Fidelity of implementation
• Pilot tested protocol May-June 2013
• Topics
  – Test administration time
  – Student actions (navigation, answering)
  – Teacher assistance
  – Variations from standard administration
  – Engagement & barriers to engagement
Scope of Observations

• 6 schools, 2 states
• 55 testlets during Field Test #3
  – Often multiple testlets per teacher & student
  – Computer-delivered testlets: 22 ELA, 17 math
  – Teacher administered testlets: 8 ELA, 8 math
Initial Results: Navigation & Entry

- Teacher navigated all screens for students on 28% of computer administered testlets
- Teacher entered responses on student’s behalf on 23% of computer administered testlets
- Assistance prompted by student distraction, self-injurious behavior; also as part of routine practice (no expectation for student to enter)
- High fidelity of student response entry
Initial Results: Engagement

- Overall, high engagement and low frustration
- 70% high engagement in computer administered testlets
- Barriers to engagement:
  - Self-injurious behaviors
  - Too many testlets in one session
  - Others in the room
- 93% low frustration on both computer and teacher administered testlets
Initial Results: Independence

• 59% high level of independence during the computer administered assessment
Teacher Survey

- Content
- Accessibility
- BVI field testing event
- Perceived difficulty
- Response time
- Training and resources
Content

• 86% agreed or strongly agreed content measured important academic skills for student

• 85% agreed or strongly agreed content reflected high expectations for student
Student Responses

• 84% agreed or strongly agreed student was able to respond regardless of constraints

• 90% agreed or strongly agreed student responded to the best of his or her ability

• 79% indicated student was engaged or engaged with prompting during FT3
Independence

• Teachers indicated 52% (310) of students independently navigated FT3 system
• 57% (2375) of students independently entered responses to FT1 items
• 42% (144) of students independently entered responses to pilot items
Supports

• Teachers responded that 79% (1757) of students had access to ALL supports needed during FT3

• Most frequent supports outside system included objects/visuals, teacher read aloud, and repeating items or key words
## First Testlet
### Teacher Reported FT2 Difficulty

<table>
<thead>
<tr>
<th>Band</th>
<th>Too Easy</th>
<th>About Right</th>
<th>Too Hard</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELA Foundational</td>
<td>4%</td>
<td>46%</td>
<td>50%</td>
</tr>
<tr>
<td>ELA Band 1</td>
<td>12%</td>
<td>62%</td>
<td>26%</td>
</tr>
<tr>
<td>ELA Band 2</td>
<td>18%</td>
<td>73%</td>
<td>10%</td>
</tr>
<tr>
<td>ELA Band 3</td>
<td>23%</td>
<td>67%</td>
<td>10%</td>
</tr>
<tr>
<td>Math Foundational</td>
<td>5%</td>
<td>54%</td>
<td>41%</td>
</tr>
<tr>
<td>Math Band 1</td>
<td>17%</td>
<td>67%</td>
<td>17%</td>
</tr>
<tr>
<td>Math Band 2</td>
<td>24%</td>
<td>66%</td>
<td>10%</td>
</tr>
<tr>
<td>Math Band 3</td>
<td>30%</td>
<td>63%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Response Time per Testlet

• Math
  – Most responded 0-10 minutes

• ELA
  – Most responded 6-15 minutes
Training and Resources

• Most used:
  – Overview of field test videos
  – Familiar texts and objects in ELA/math
  – Using the DLM system module
  – Tested Essential Elements

• Least used:
  – About the DLM system video
  – DLM User Guide pdf
  – Self-directed learning PD modules
Recommendations for Preparation

• Face-to-face training on KITE system/website
  – Local assistance when needed
• Requests for checklists, manipulative lists, manuals
  – Already available
  – Will make sure to highlight during training
THANK YOU!

For more information, please contact: dlm@ku.edu

or

Go to: www.dynamiclearningmaps.org

For Professional Development, contact: dlm@unc.edu

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