

Evaluation of Resources to Support Diagnostic Score Report Interpretation

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Author Note

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## Abstract

While the resources made available to teachers to support their understanding and use of diagnostic score reports are important, relatively little research has been conducted into their use to support teachers following delivery. To address this gap in the literature, teacher interviews and focus groups were conducted during spring 2018 with teachers from a sample of the 17 states in the Dynamic Learning Maps Consortium. Focus groups were semi-structured, in which questions prompted participants to share information about resources they have found useful or desired to support their use of diagnostic score reports for instructional practice. Focus groups were recorded and subsequently transcribed and coded for themes. Teacher feedback on resources were identified for three key areas: resources for (a) parents, (b) educators, and (c) district users.

*Keywords:* score report resources, interpretation and use, supporting teachers, score report delivery

## Evaluation of Resources to Support Diagnostic Score Report Interpretation

The *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014) indicate that sources of evidence collected to evaluate an assessment's validity argument should include consequential evidence to evaluate the extent that assessment results are used for intended purposes. Relatively little research has been conducted on how to support teachers and other stakeholders in using reports for their intended purposes. The Council for Exceptional Children recognizes teacher interpretation and communication of assessment information and teacher use of assessment data for instructional adjustments as high leverage practices, signifying the value of supporting teachers in this effort (McCleskey et al., 2017). In order to support effective interpretation and use of score reports, teachers should be provide with interpretive guides and resources that explain score report contents and their application.

### **Alternate Assessments**

Score reports have the potential to be useful tools for teachers when they are able to interpret and use them to inform, intervene in, and enrich their instruction. However, several researchers have found that teachers may have misconceptions about the information provided in score reports (Clark, Karvonen, Romine, & Kingston, 2018), may not see the score report as providing adequate information (Marion, 2018; Yeh, 2006), and may not use results in the most impactful ways (Hoover & Abrams, 2013). Although several researchers, including some of the authors, have examined how the design of score reports can beneficially alter teachers' use of assessment results (e.g. Clark, Karvonen, Kingston, Anderson, & Wells-Moreaux, 2015; Zenisky

& Hambleton, 2012), very little research has been conducted on direct ways to support teachers' interpretation and use of the reports.

Historically alternate assessment score reports have included limited information to guide changes in instructional practice (Nitsch, 2013). Some evidence suggests that teachers have not systematically used alternate assessment results when determining student progress or deciding what to teach after students have mastered academic skills (Karvonen, Wakeman, Moody, & Flowers, 2013). One of the aims of large-scale assessment is to provide parents, teachers, and students with score reports that are meaningful and useful. Useful score reports meet teachers' information needs as they set and assess progress toward goals, address individual needs, evaluate effectiveness of practice, and determine whether they are meeting student needs (Marsh, Pane, & Hamilton, 2006). As such, score reports for DLM Alternate Assessments are designed to address these challenges by providing actionable information to guide instructional decisions while also being appropriate for accountability purposes.

### **Dynamic Learning Maps Alternate Assessments**

Dynamic Learning Maps (DLM) Alternate Assessments are available to students with the most significant cognitive disabilities in participating states. Alternate content standards provide all students access to grade-level content at increasing levels of complexity. Consortium state partners developed and agreed upon the intended uses of DLM assessment results. The intended uses of summative results from DLM assessments are: 1) to report achievement within the taught content aligned to grade-level content standards to a variety of audiences, including educators and parents; 2) inclusion in state accountability models to evaluate school and district performance; and 3) to plan instructional priorities and program improvement for the following school year. Additional uses, contingent on individual state policy include: 4) evidence of

teacher and principal effectiveness; and 5) graduation (in states that use alternate assessments as an exit exam).

DLM assessments are calibrated and scored using diagnostic classification modeling to determine student mastery of skills rather than producing a traditional scaled score measuring a single latent trait. As such, assessment results summarized in DLM score reports are based on the set of mastery decisions for all skills tested in the subject and grade level. Mastered skills are also aggregated to summarize performance for content strands and the subject overall. To report these results, summative score reports for DLM assessments consist of two parts: a fine-grained Learning Profile and a high-level Performance Profile. The Learning Profile summarizes dichotomous mastery classification for skills measuring each content standard in the subject. Each standard consists of five skill levels, called linkage levels, which represent varied complexity from the grade-level target, with the report providing available mastery information for each. The Performance Profile aggregates mastery information across the content standards into overall results by subject area that includes a breakdown of specific skill areas assessed and mastered. DLM staff developed each report based on relevant research literature and refined the reports through multiple rounds of focus groups conducted with educators and parents. DLM staff have since documented the interpretability of the final report prototypes (Clark et al., 2015), collected preliminary evidence of how teachers evaluate score report contents (Karvonen, Clark, & Kingston, 2016), and documented the impact of score report interpretation resources on teachers' understanding of report contents (Karvonen, Swinburne Romine, Clark, Brussow, & Kingston, 2017).

To provide evidence of how teachers are using results from DLM assessments, teachers from several consortium states participated in two studies to share how they used summative

results from the individual student score reports during the year. We evaluated how participants used summative scorer reports in the subsequent academic year and whether an online tutorial supported effective teacher use of score report content. Part of what emerged from these studies included a discussion among teachers and DLM staff about the resources that would support their understanding and use of diagnostic score reports. Relatively little research has been conducted into resources to support teacher use of reports following their delivery, so we describe both studies and their findings with respect to score report resources here.

## **Methods**

### **Participants**

In spring 2017, teachers in 6 DLM Consortium states were recruited for participation in a score report tutorial, completion of which would count toward professional development credit depending on state guidelines. A total of 93 teachers participated, but 64 completed the video in its entirety (31% attrition).

During spring 2018, DLM staff conducted a focus group study. State partners recruited teachers to participate and distributed recruitment materials to potentially eligible teachers. To participate, eligible teachers indicated that they

1. currently taught one or more students taking DLM assessments in 2017-2018,
2. received DLM 2017 summative score reports for their 2017-2018 students, and
3. used the DLM 2017 reports during the 2017-2018 academic year.

Interested teachers completed a Qualtrics survey that requested information about their background and their eligibility. 135 teachers responded to the survey and based on their responses to the three eligibility questions 40 of those teachers were contacted to participate. Of those, 17 participated in focus groups representing three consortium states. The number of

participants per call ranged from one to five, with several focus groups conducted as one-on-one interviews due to attrition. They are collectively referred to as focus groups for the remainder of the paper.

Teachers in the final sample of 17 mostly self-reported as white ( $n = 13$ ) and female ( $n = 13$ ) and they taught in a range of settings, including rural ( $n = 2$ ), suburban ( $n = 9$ ), and urban ( $n = 5$ ) schools. Teachers taught students in all tested grades (3-12) and all tested subjects (ELA, math, and science). Table 1 describes teachers' years of experience with each subject and with students with significant cognitive disabilities.

Table 1

*Participating Teachers' Years of Experience per Subject and Population*

Years	ELA	Math	Science	Students with SCD
1-5	4	4	5	6
6-10	4	5	3	4
11+	7	5	6	5

## Procedures

For the score report tutorial study, participants responded to a survey regarding their confidence in their ability to interpret and use DLM score reports. Following this, the participants were presented with either a 20 minute or 30 minute online on-demand video tutorial depending on whether they taught in a year-end or integrated model state. The video incorporated concepts from the DLM interpretation guide and addressed misconceptions identified in previous score report interpretation interviews with teachers. Participants then completed a post-test. Those who passed with a percentage of 80% were granted a certificate of completion. Following the tutorial video, participants also completed an evaluation of the tutorial itself (55 participants completed the evaluation). The evaluation survey contained two open-

ended questions; one asked participants to indicate what additional resources would help with interpretation and use of DLM score reports. Responses to this question were not formally analyzed or coded, but are summarized below.

For the focus group study, we notified participants of focus group scheduling via email. The invitation included an informed consent document to sign and return and an example score report PDF. Because of the differences in score reports by assessment model, focus groups were conducted separately by model, with participants receiving an example report that included a Performance Profile (Figure 1) and, for Integrated Model states, the Learning Profile (Figure 2). The example score report was provided for one grade and subject. The provided example additionally had red overlay boxes with labels indicating the parts of the report (e.g., performance levels, descriptors, conceptual area graphs) to support orientation to the report, in the event someone needed to refer to a part of the report during the focus group discussion.

We conducted focus groups virtually using Zoom conferencing software. Where possible, participants were encouraged to use video conferencing to facilitate participation, but this was not required. We recorded the audio for all focus groups and subsequently transcribed each verbatim. Each focus group began with a brief summary of purpose, review of the informed consent document, brief review of score report contents, and an introduction of focus group participants. Following this introduction, focus groups followed a semi-structured format. Guiding questions were available to facilitate discussion and prompt for more information related to the four research questions. Participants were asked to describe receiving score reports, and how they use reports for their current students in planning or implementing instruction in any of the tested subjects (English language arts, mathematics, and/or science). Participants also



described how they discuss reports with parents and shared information about available or desired resources to support their score report use.

Data analysis for the focus group study included the use of a coding protocol to determine how participants used DLM 2016-2017 summative score reports during the 2017-2018 academic year. Transcripts were coded according to descriptive themes related to the four research questions, including how reports were received; use for instruction, including planning, IEP goal development, and instructional groupings; talking with parents; and resources for parents, teachers, and districts. This paper summarizes preliminary findings, with a more intensive, multi-rater coding procedure and codebook to follow.

Focus groups were semi-structured, in which questions prompted participants to share information about resources they have found useful or resources they desired to support their use of diagnostic score reports for instructional practice. Interviews and focus groups were recorded and subsequently transcribed and informally evaluated for themes.

## **Results**

Participants reported that the score report tutorial improved their confidence in interpreting and using DLM score reports (11% strongly agreed, 76% agreed after the tutorial, up from 12% and 36% respectively). Of the teachers who took the post-test, 18 passed with at least 80% accuracy on the first try; 24 attempted the tutorial and test a second time, and two passed the 80% threshold. None of the ten participants who completed the tutorial and test a third time achieved the 80% threshold. Feedback regarding additional resources teachers would find helpful included local training and additional materials to support instructional planning and decision-making, a repository of training videos on different aspects of DLM, which is already available, and transcripts and print-outs of the sample reports presented in the tutorial video.

In the focus group study, teachers identified resource needs for three audiences: (a) parents, (b) individual teachers, and (c) group-level district training. Many of these recommendations correspond to those observed during the score report tutorial study.

**Parents.** Teachers noted that parent-teacher conferences and IEP meetings often inundate parents with information about their student from a variety of sources. Because these meetings may leave parents feeling overwhelmed, teachers suggested creating resources that could be introduced at the meeting, but also available on the DLM website for parents after the meeting. Resources might include a brief assessment overview summarizing how results are calculated, the assessment Parent Interpretive Guide, and cheat sheets for tying academic content in score reports to day-to-day interactions with their children.

**Teachers.** Participants described wanting additional training opportunities around how to interpret results and use for planning subsequent instruction. This might include separate meetings to (a) receive results and discuss interpretation, (b) begin planning subsequent instruction, and (c) provide for cross-collaboration across sending and receiving teachers of a particular student during transitional years. Teachers also expressed a desire for more information in aggregate form to support identifying instructional groupings and quickly identify students working on similar areas.

**Districts.** Teachers highlighted the value of district-provided professional development activities that incorporated interpretation of the previous year's reports. Teachers suggested district trainings for interpreting results and planning instruction and suggested providing district agencies with summary reports they could use to support teachers. They suggested these reports could be used to evaluate from a programmatic level if certain standards were perhaps being covered less or that may be more challenging to teach. By identifying these areas collectively,

the participants suggested districts may be better equipped to point teachers toward already available resources or host trainings to address potential areas of challenge.

### **Discussion**

Presently, the DLM Consortium offers interpretive guides online for teachers and parents to aid their interpretation and use of score reports, in addition to some explanatory content on the reports themselves. Interpretive information is additionally available for building administrators and state and local education agency staff. During focus groups, some teachers expressed that they were not aware of these resources. This may suggest the resources are not widely shared among teachers. This was also evidenced during the score report tutorial follow-up questions, during which teachers requested resources that do already exist on the DLM website. It is possible that teachers may believe that the current assortment of resources are not useful or approachable in their current format or location. In either case, this indicates a need to make them aware of the resources that are available and inquire as to how they might be more accessible or useful.

What emerged most frequently was the teachers' desire for human collaboration on score report interpretation and use in addition to the existing guidance available online. Teachers desired a DLM staff member or ambassador to facilitate trainings on score report use and interpretation generally, and/or to discuss their particular students' reports with them. Teachers also discussed several desired opportunities for collaboration among teachers. First, they would like opportunities to interpret reports with teachers experienced in DLM assessments, such as master teachers in a type of mentorship model. Second, teachers would prefer opportunities to meet with students' upcoming teachers to discuss assessment results and plan instruction and/or IEP goals for students transitioning into new classrooms. Third, teachers would like to attend

district-level training events to support interpretation of results and instructional planning. This aligns with past observations; previous studies DLM staff conducted with teachers have revealed that teachers with access to instructional facilitators and built in time for structured professional development sessions and learning community meetings credit those resources with helping them interpret and use score reports (Karvonen, Clark, & Kingston, 2016).

These are largely actionable steps that the DLM Consortium could implement and/or encourage partner states, districts, and schools to consider. Although not practical to provide every teacher with access to a DLM ambassador, current DLM trainings could be oriented toward score report interpretation and usage and could facilitate the creation of collaborative teacher teams. Whatever the solution, it is clear that the teachers interviewed would find score reports more usable if they had access to collaboration opportunities.

The interviews also uncovered teachers' desire for more explicit directions for instructional planning based on score reports. Teachers may understand the literal assessment results, but the next steps for instruction may be less clear. One of the goals of the DLM assessment is to provide a clear map for skill acquisition, and thereby a map for instruction. It is possible that the reports, especially summative, are too removed from instruction and the DLM learning map model for teachers to easily use score reports for instructional planning. Although mini-maps and other model-based instructional resources are available through DLM, teachers may prefer guidance from and collaboration with DLM ambassadors or other teachers for instructional planning, rather than interacting with an online resource.

### **Conclusion**

The present study contributes to conversation surrounding score report interpretation and usage among teachers. Score reports are intended to be useful sources of data to help teachers

determine instructional priorities and approaches, but in addition to their design, we must also consider their supporting resources. Although documentation on score report contents, score interpretation, and learning map models are available to stakeholders through online portals, teachers repeatedly expressed a desire for guidance from another person. Whether that is another teacher, a DLM staff member, or a district facilitator, it is clear that many teachers would find score reports more useful to their day-to-day instruction if accompanied with collaborative opportunities.

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

Individual Student Year-End Report  
 Performance Profile 2017-18

DYNAMIC<sup>®</sup>  
 LEARNING MAPS

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 category

The student identifies text elements by:

- identifying details in a familiar text

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

Individual Student Year-End Report  
 Performance Profile 2017-18

DYNAMIC<sup>®</sup>  
 LEARNING MAPS

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

DISTRICT ID: DLM District ID  
 STATE: DLM State

### Performance Profile, continued

#### Conceptual Area

Construct understandings of text	100% Mastered 10 of 10 skills*	Integrate ideas and information from text	7% Mastered 1 of 15 skills
Use writing to communicate	10% Mastered 2 of 20 skills	Integrate ideas and information in writing	20% Mastered 2 of 10 skills

\*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.

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Figure 1. Performance Profile report delivered to all states. Results include performance level, performance level descriptors, and conceptual area bar graphs summarizing the percent of skills mastered in each area.



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

**Individual Student Year-End Report**  
**Learning Profile 2017-18**



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

DISTRICT ID: DLM District  
 STATE: DLM State

Student's performance in 10<sup>th</sup> 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 10<sup>th</sup> 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.

Area	Essential Element	Level Mastery				
		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  
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Figure 2. Learning Profile report delivered to states participating in the through-course assessment model. Shading indicates skills mastered for the five linkage levels available for each “Essential Element” content standard.