



DYNAMIC[®]
LEARNING MAPS

**Aligned Academic Achievement
Standards to Support Pursuit of
Postsecondary Opportunities:
*Instructionally Embedded Model***

Technical Report #20-02
October 2020

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Executive Summary

The Dynamic Learning Maps® (DLM®) Alternate Assessment System provides students with the most significant cognitive disabilities the opportunity to demonstrate their knowledge, skills, and understandings (KSUs) on challenging grade-level content aligned to general-education academic standards but at reduced depth, breadth, and complexity. The Dynamic Learning Maps (DLM) Consortium's theory of action includes beliefs, activities, outputs, and outcomes in support of student attainment of high academic expectations so they are prepared for postsecondary opportunities (DLM Consortium, 2016).

This report describes evidence of the alignment of the DLM alternate academic achievement standards and the relationship of those standards to the knowledge, skills, and understandings (KSUs) required for pursuit of postsecondary opportunities. This evidence supports validity evaluation for the DLM alternate assessment system and fulfills the requirement for U.S. Department of Education peer-review evidence (Office of Elementary and Secondary Education, 2018) regarding this part of Critical Element 6.3: "The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment." This requirement was added to the Critical Element in 2018 and retroactively applied to assessments that had already been peer reviewed under the current requirements.

Through the research described in this report, we identified a sampling of academic skills that students may use to pursue a variety of postsecondary education and employment options and evaluated the relationship of those skills to the At Target performance level descriptors (PLDs) in each grade. We had two hypotheses about the expected relationship between meeting DLM alternate academic achievement standards (i.e., achieving At Target) and being prepared for postsecondary opportunities.

Hypothesis 1: Nearly all academic skills will be associated with PLDs at a variety of grades between grade 3 and high school. Few if any academic skills will first occur before grade 3 At Target or after high school At Target.

Like academic education for all students, academics for students with significant cognitive disabilities (SCD) builds across grades. People use academic skills at various levels of complexity, depending on what is needed for a job or postsecondary education. Therefore, academic skills associated with achieving At Target in lower grades indicate where students are ready to apply the least complex version of the skill. Given the vertical alignment of DLM content and achievement standards, students are expected to continue their learning in subsequent grades and be ready for more-complex applications of the academic skills by the time they transition into postsecondary education and employment.

Hypothesis 2: Because academic skills may be applied across various employment and education opportunities and they are also embedded in the soft skills needed to pursue those opportunities, we expected Hypothesis 1 to hold for the academic skills associated with employment opportunities, education opportunities, and soft skills.

The DLM Consortium's evidence is divided into two parts: *alignment* of the achievement standards, and evidence that a student who meets the standards would be *on track to pursue* postsecondary opportunities.

Alignment

Evidence that DLM achievement standards are aligned was first reported in initial DLM peer-review submissions (2014–15 administration for ELA and mathematics, 2015–16 administration for science). The evidence met expectations for Critical Element 6.3 as it was defined at the time; no further evidence was required. The evidence is summarized again in this report to support the reader’s evaluation of the full body of evidence for this part of Critical Element 6.3. The evidence, summarized in Chapter 3, includes descriptions of the development and evaluation of content structures (learning map models, Essential Elements, and linkage levels); the standard-setting process; and the development of grade- and content-specific PLDs to describe skills typically mastered by students achieving at each of four performance levels.

On Track to Pursue Postsecondary Opportunities

Evidence that a student who meets the DLM achievement standards would be on track to pursue postsecondary opportunities comes from a series of panel activities conducted in 2019–2020.

The first panel, conducted in October 2019, identified a range of postsecondary education and competitive integrated employment opportunities that students with SCD might pursue (see Chapter 4). The goal was to identify an extensive sampling of opportunities, not an exhaustive list. Panelists considered the types of educational and employment opportunities currently available to students with SCD and opportunities that may be more aspirational (i.e., students may not regularly access them now, but the opportunities may become available as a result of the Workforce Innovation and Opportunity Act).

This panel—comprising professionals with experience in secondary transition, postsecondary education and/or employment, and competitive integrated employment—identified 57 employment opportunities and seven education opportunities. The employment opportunities spanned sectors including agriculture, business, arts, education, health sciences, hospitality, information technology, manufacturing, and transportation.

The panel next identified the KSUs needed to fulfill the responsibilities for the employment opportunities, including the academic skills within the broader KSUs. Panelists also identified eight common responsibilities across all postsecondary education opportunities and the KSUs for each responsibility. Finally, the panel identified the KSUs within soft skills (e.g., self-advocacy, social skills) that are applicable across many postsecondary settings. Subject-matter experts in ELA, mathematics, and science reviewed and refined the panel-derived academic skill statements for clarity and consistency. This process resulted in 50 ELA skills, 41 mathematics skills, and 53 science skills to be used in the second phase of the study.

The second set of panels, one per subject, examined the relationship between the academic skills and the kinds of academic KSUs typically associated with meeting the DLM alternate academic achievement standards (i.e., achieving At Target; see Chapter 5). Panelists rated the academic skill statements derived from the first panel against the DLM At Target PLDs at each grade. Panels identified the lowest grade in which a student achieving At Target is likely to consistently demonstrate the academic skill, which is the first indication that students are ready to pursue postsecondary opportunities that require less-complex applications of the skill. Given the vertical alignment of DLM achievement standards, students who are At Target in lower grades are expected to continue learning in subsequent grades so that they are prepared for

more-complex applications of the academic skills by the time they transition into postsecondary education and employment.

Each panel consisted of educators from across DLM states, including general educators and special educators who administered DLM assessments. Most panelists had expertise across more than one grade band, and some had dual certification (i.e., academic subject and special education). Each panel completed training and calibration activities before making independent ratings. When there was not majority agreement on independent ratings, the panel discussed their ratings and reached consensus. Panels also had the option to add or modify skills during the discussion phase (e.g., clarify interpretation and support a consensus, create differentiated versions in which each new statement more clearly linked to what is expected at different grade levels).

Panels identified the lowest grade in which students who achieve At Target on the DLM alternate assessment are at least 80% likely to be able to demonstrate each skill, indicating their first point of readiness to pursue postsecondary opportunities that require the least complex application of academic skills. In ELA, students achieving At Target are expected to first demonstrate 96% of those skills by grade 5 (see Table 0.1). In mathematics, students meeting achievement standards are expected to first demonstrate 72% of the academic skills by grade 5 and 24% of skills in middle grades (grades 6-8). Skill ratings are distributed more evenly in science: 40% of skills are expected to be first demonstrated by students achieving At Target in elementary grades, followed by 35% in middle grades and 25% in high school. (Full distributions are presented in Figure 5.3–Figure 5.5 in Chapter 5.)

Table 0.1

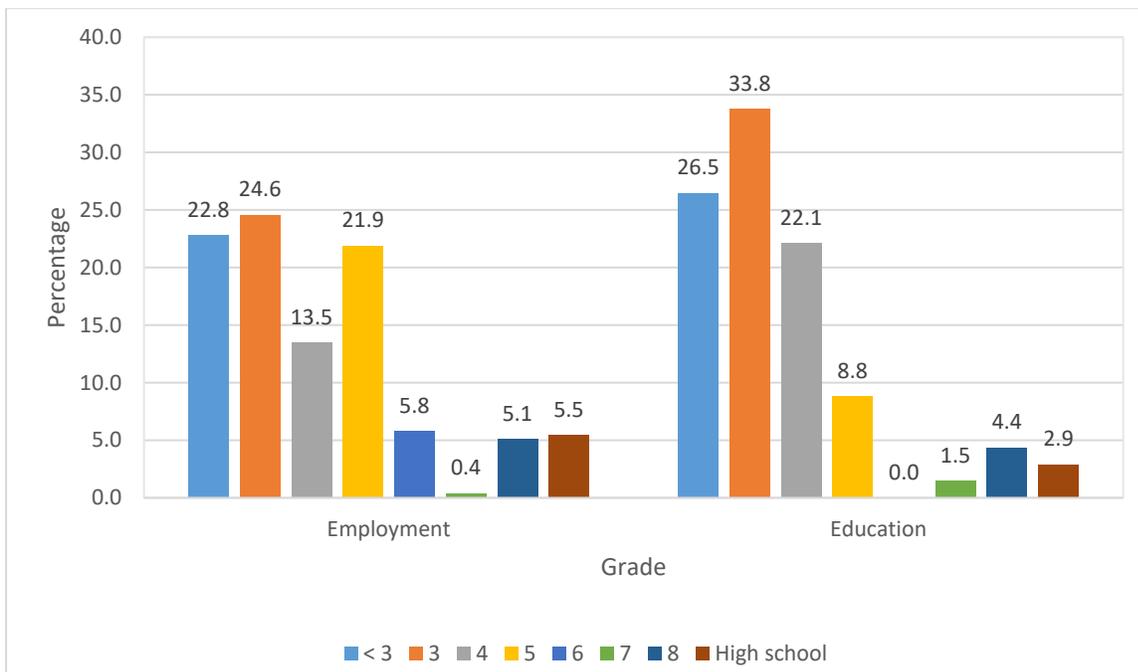
Percentage of Academic Skills First Expected for Students Achieving At Target, by Grade Band and Subject

Subject	Grade 5 or lower	Grades 6–8	Grades 9–12 / High school
ELA	96.0	2.0	2.0
Mathematics	71.7	23.9	4.4
Science	40.4	34.6	25.0

Note: High school ratings include general science and biology.

Some academic skills are applicable across both employment and education settings, while others may be unique to one of those settings. We explored the distributions of academic skill ratings across all subjects by employment ($n = 546$) and education ($n = 68$) opportunity categories (see Figure 0.1). Nearly 83% of the academic skills were rated from below grade 3 through grade 5 across employment opportunities, whereas more than 91% were rated from below grade 3 through grade 5 across education opportunities.

Figure 0.1
Distribution of Academic Skills Across the Lowest Grades in Which a Student At Target Is Likely to Demonstrate the Skill, by Employment and Education Opportunities



Soft skills, such as critical thinking and social skills, require academic skills that are applicable across both employment and education opportunities. Panels determined that 78% of the academic skills associated with five soft skills would first be demonstrated by students who performed At Target at or before grade 5 (see Chapter 5, Table 5.4).

Overall, findings from the two panels indicate that

- Experts can identify a range of postsecondary opportunities for students with the most significant cognitive disabilities, including competitive integrated employment across a variety of sectors; and several types of postsecondary education opportunities
- Most academic skills needed to access postsecondary outcomes are first associated with meeting the DLM academic achievement expectations in elementary grades. Given the vertical alignment of the DLM academic achievement standards, students who achieve At Target in early grades build on these skills as they progress through school so that, by the time they leave high school, they are ready to pursue postsecondary opportunities that require more-complex applications of the academic skills.

Panelists also participated in focus groups to share their general perceptions of opportunities, skills, and expectations for students with SCD. Panelists believed the academic skills were important to postsecondary education and employment opportunities for all students, not only those with SCD. Panelists indicated that students who were At Target in high school on the DLM alternate assessment possessed the necessary academic knowledge, skills, and opportunities to pursue a range of postsecondary opportunities.

Conclusions

Results of the study support our hypotheses. Almost all academic skills were associated with PLDs from grades 3 through high school. Distributions were evident for skills associated with education opportunities, employment opportunities, and soft skills.

Findings indicate students with the most significant cognitive disabilities who achieve At Target on the DLM alternate assessments possess a range of KSUs applicable to a variety of postsecondary education and employment opportunities. The vertical alignment evidence supports the identification of the earliest grade a student who is At Target demonstrates the skill. The high percentages of skills rated in earlier grades signifies the academic skills are introduced early in students' academic careers, providing ample time for students to learn and practice more-complex versions of the skills before they graduate or leave high school, thus providing evidence that students who are At Target in high school are on track to pursue postsecondary education and employment opportunities.

Evaluations of panelists' experiences from both panels and DLM Technical Advisory Committee members' review of the processes and evaluation results provide evidence that the methods and processes used achieved the goals of the study.

1. Introduction

The Dynamic Learning Maps® (DLM®) Alternate Assessment System provides students with the most significant cognitive disabilities the opportunity to demonstrate their knowledge, skills, and understandings (KSUs) on challenging grade-level content aligned to general education academic-standards but at reduced depth, breadth, and complexity. DLM assessments in ELA, mathematics, and science are designed for a small population of students (approximately 1% of the population) in grades 3 through 8 and high school for whom general large-scale assessments, even with accommodations, are not appropriate. Students who are eligible to take DLM assessments have a significant cognitive disability (SCD) or multiple disabilities that have a substantial bearing on intellectual function and adaptive behavior requiring individualized support, and receive academic instruction based on the DLM Essential Elements (EEs).

DLM assessments have been used operationally since 2015 in ELA and mathematics and since 2016 in science. In 2019–2020, 20 states and a Bureau of Indian Education school used DLM alternate assessments in one or more subjects.

ELA and mathematics assessments are administered in one of two assessment models (selected by each state): instructionally embedded or year end. All states use the same model for science assessment. This report describes evidence collected for the instructionally embedded model and for science.

The Dynamic Learning Maps (DLM) Consortium’s theory of action includes beliefs, activities, outputs, and outcomes in support of student attainment of high academic expectations so they are prepared for postsecondary opportunities (DLM Consortium, 2016). While the DLM Consortium has collected extensive evidence on the academic performance of students who take DLM assessments, evidence has not yet been collected concerning the relationship between what is expected for students who meet the DLM alternate academic achievement standards and what is needed to pursue postsecondary education and employment opportunities.

This report describes evidence collected to evaluate the extent to which the DLM alternate academic achievement standards meet this criterion: “The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.”

This criterion is a requirement for alternate assessments based on alternate academic achievement standards under U.S. Department of Education peer review for statewide assessment systems (Critical Element 6.3; see Office of Elementary and Secondary Education, 2018).

DLM Academic Achievement Standards

DLM assessments are based on the EEs in each subject. The EEs link general education content standards to rigorous academic expectations for students with SCD. DLM assessment results are described using four performance levels that describe the academic achievement standards. The policy performance level descriptors (PLDs) are Emerging, Approaching the Target, At Target, and Advanced (see Figure 1.1). There are also PLDs specific to each grade and subject (see Appendix 1.A for an example and the dynamiclearningmaps.org website for all PLDs by grade and subject).

A student **meets the alternate academic achievement standards** if their overall performance level is at least At Target.

Figure 1.1
DLM Policy Performance Level Descriptors

The student demonstrates **emerging** understanding of and ability to apply content knowledge and skills represented by the Essential Elements.

The student's understanding of and ability to apply targeted content knowledge and skills represented by the Essential Elements is **approaching the target**.

The student's understanding of and ability to apply content knowledge and skills represented by the Essential Elements is **at target**.

The student demonstrates **advanced** understanding of and ability to apply targeted content knowledge and skills represented by the Essential Elements.

Postsecondary Opportunities

After high school, individuals with SCD may pursue a wide range of opportunities for employment, education, citizenship, and community involvement. Employment opportunities have historically been limited for this population (National Longitudinal Transition Study-2, 2007; Newman et al., 2009), often in sheltered workshops for below minimum wage (Rusch & Braddock, 2004). However, opportunities should expand as states adjust to the 2014 Workforce Innovation and Opportunity Act (WIOA) requirement that individuals with the most significant cognitive disabilities have opportunities to pursue competitive integrated employment. This type of employment is different from what has historically been available for students with SCD and includes these features:

- full-time or part-time work at minimum wage or higher
- wages and benefits similar to those received by individuals without disabilities performing the same work
- fully integrated
- may include customized and/or supported employment

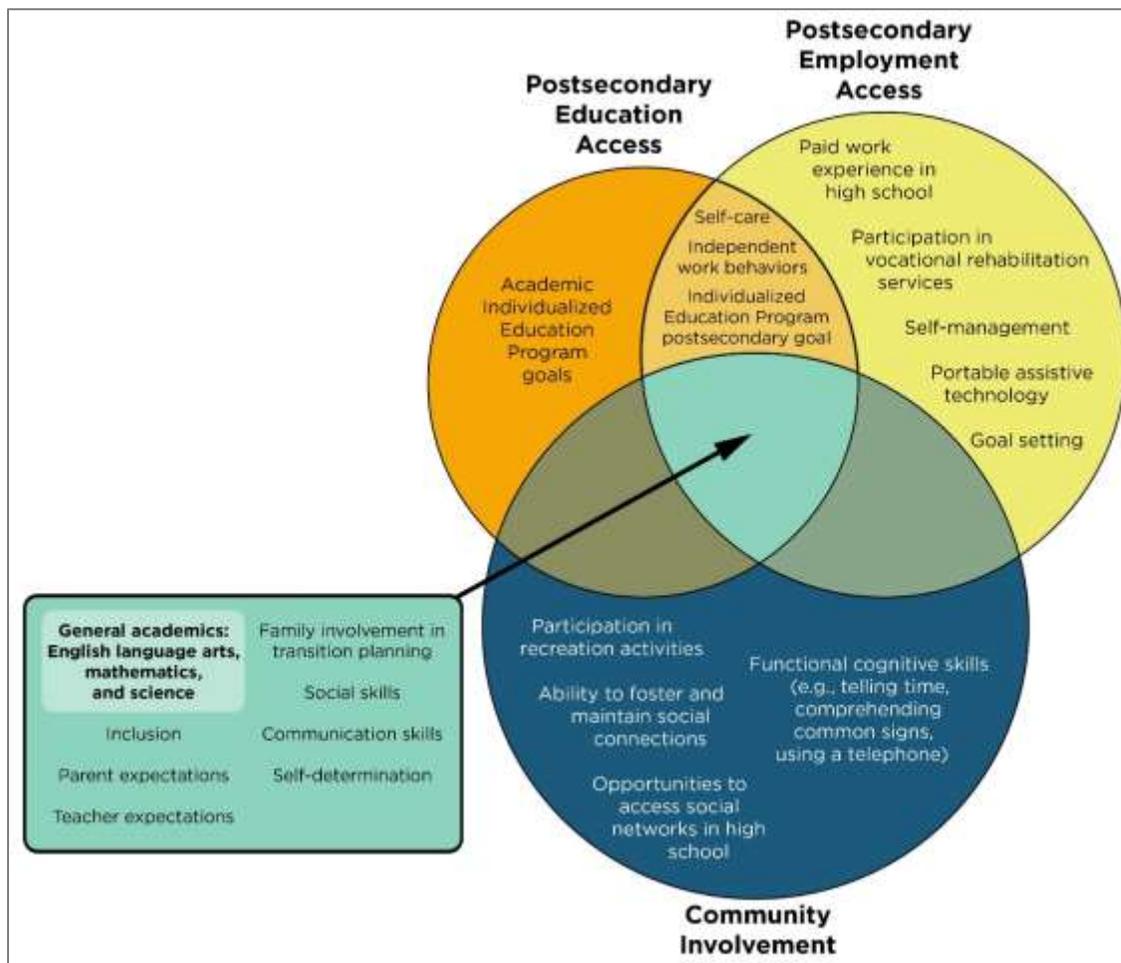
The WIOA also provides supports for individuals who wish to pursue postsecondary education. Options for postsecondary education have expanded over the last 10 years through U.S. Department of Education-funded Transition and Postsecondary Programs for Students with Intellectual Disabilities, designed so students may gain access to programs on university or community college campuses. These programs provide a college experience focused on student interests and skillsets while also allowing students to gain employment training and experience. However, these programs have traditionally been available to students with mild to moderate intellectual disability, not students with SCD.

There is some evidence that secondary students' in-school experiences are related to their postsecondary access and outcomes. For example, students with SCD or intellectual disabilities who experience paid work during high school are more likely to have successful postsecondary competitive integrated employment (Carter et al., 2012; Papay & Bambara, 2014; Simonsen & Neubert, 2012). Students with intellectual disabilities who are active in their transition-planning process are more likely to enroll in a postsecondary education class and more likely to be

employed after high school (Papay & Bambara, 2014). However, we identified no research linking academic achievement to postsecondary employment and education among students with SCD.

To prepare for this study, we developed a framework of postsecondary opportunities and skills for students with SCD. The framework is based on existing literature and key informant input.¹ The framework (see Figure 1.2) highlights predictors of access to postsecondary education, employment, and community involvement for students with SCD. While academic achievement has not been empirically shown to be a predictor of postsecondary access, the framework shows that academic KSUs support access to education, employment, and community involvement opportunities.

Figure 1.2
Postsecondary Opportunities and Skills Framework



Although not reflected in the figure, external and systemic factors also influence access to postsecondary opportunities. For example, state budgets, adequate staffing, availability of

¹ See Appendix 1.B for a full description of the postsecondary opportunities and skills framework development and refinement process.

transportation, availability of opportunities in one's community, and staff training can affect students' access to postsecondary opportunities.

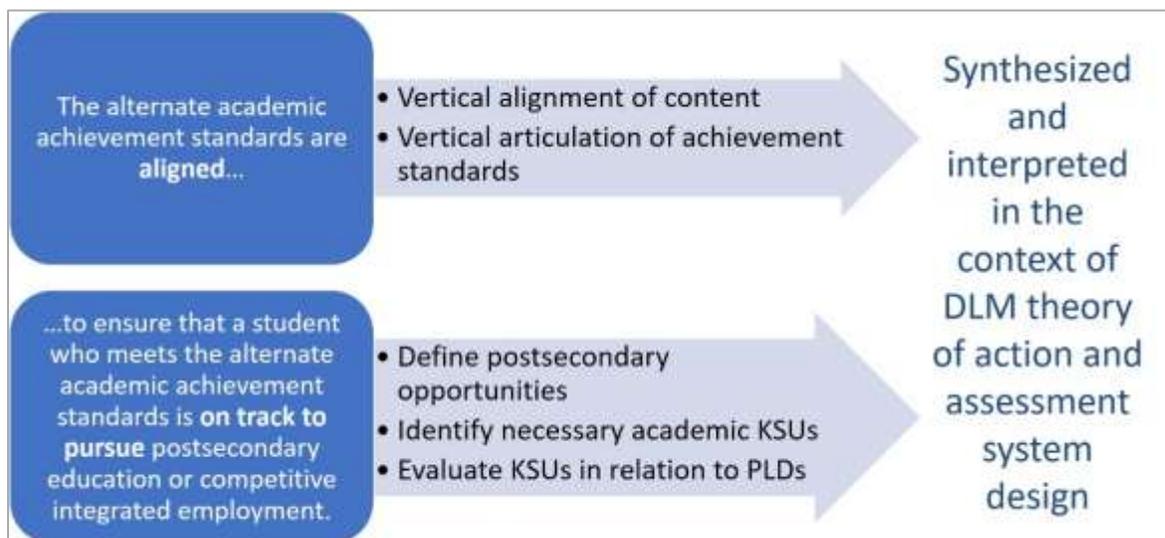
Overview of the Study

The purpose of this study was to evaluate the extent to which the DLM alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.

There are many factors that affect students' access to postsecondary opportunities and their success with those pursuits. Therefore, this study is delimited to the relationship between academic KSUs typically associated with meeting achievement standards (i.e., grade-specific PLDs) and the academic KSUs needed to pursue a range of postsecondary opportunities. We used the PLDs instead of the EEs (extended content standards) because the PLDs are more directly related to the academic skills expected for students whose achievement is At Target on DLM assessments. (Content standards set expectations for what students should learn in each grade, while achievement standards indicate how much academic knowledge a student demonstrates on an assessment.)

Following the language provided in the peer-review guidance, we collected evidence according to two tracks: alignment of achievement standards and evidence that students who meet alternate academic achievement standards are on track to pursue postsecondary opportunities, as shown in Figure 1.3.

Figure 1.3
Sources of Evidence



Note: KSUs = knowledge, skills, and understandings; PLDs = performance level descriptors.

Evidence of aligned academic achievement standards comes from initial DLM assessment design and development activities conducted through 2016. Content evidence is based on development and evaluation of the DLM map structure, the EEs measured by the assessment, the linkage levels at which content is assessed, and alignment of the assessment system. Empirical evidence supports the ordering of linkage levels within EEs. A standard-setting

method was used to specify cut points between achievement standards. Achievement standards were vertically articulated during the standard-setting process. Grade- and content-specific PLDs describe skills typically mastered by students achieving at that level. All of this evidence was part of the initial DLM peer-review submissions, based on the 2014–2015 administration for ELA and mathematics and the 2015–2016 administration for science. That evidence met expectations for Critical Element 6.3 as it was defined at the time; no further evidence was required.

Evidence that students who meet achievement standards are on track to pursue postsecondary opportunities was collected through panel activities in 2019 and 2020. A panel of experts on secondary transition or education of students with SCD, or both, identified postsecondary, competitive integrated employment and education opportunities and the KSUs needed to carry out the necessary responsibilities for these opportunities. Subject-matter experts reviewed and refined the academic skill statements using consistent academic language across all skills. A second set of panels—one each for ELA, mathematics, and science/biology—was convened to rate these academic skill statements against the DLM PLDs in each subject. Panelists for each subject-specific panel selected the lowest grade in which a student who achieves At Target could consistently demonstrate each identified academic skill. Panelists also participated in a focus group to explore their perceptions about the opportunities, skills, and expectations for students with SCD.

Hypotheses

While the DLM system was designed to promote student attainment of rigorous academic achievement standards and prepare students for postsecondary opportunities, the system was not designed with specific postsecondary opportunities in mind. With the WIOA reauthorization (which occurred after DLM achievement standards were set), those opportunities are likely to shift in the coming years.

Before completing the second part of the study, we decided it was important to articulate hypotheses and a supporting logical argument about the expected relationship between meeting academic achievement standards and being prepared for postsecondary opportunities.

1. The DLM theory of action includes a belief about the importance of teaching appropriately challenging content so students are prepared for postsecondary opportunities. One expected outcome is that students make academic progress while they are in school so they are prepared for postsecondary opportunities. An important part of helping students reach high expectations is balancing rigorous expectations with access to the content.
2. Meeting DLM academic achievement standards should be indicative that a student has the necessary academic KSUs to pursue a range of postsecondary opportunities, including education and competitive integrated employment. Meeting the achievement standards does not guarantee postsecondary success because there are so many other factors that affect availability of opportunities and student experiences as they pursue opportunities.

3. Students with SCD often need substantial supports during education. It is reasonable to assume these students might need continued supports as they pursue postsecondary employment or education. Thus, pursuit of opportunities is not assumed to require a certain type or amount of support or independence. In other words, students will need variable amounts and types of supports to pursue opportunities using their academic KSUs.
4. Academic KSUs needed for postsecondary opportunities will range in complexity, much like academic content builds in complexity across grade-level content standards (i.e., EEs) and across linkage levels within a grade.
5. Some postsecondary opportunities will require less-complex academic KSUs than others. Requiring more-complex KSUs of all students with SCD could have the unintended consequence of limiting access to postsecondary opportunities for some students.
6. Providing access to postsecondary opportunities for the full range of students with SCD requires us to assume students can have access to those opportunities using less-complex academic KSUs and continue to learn while pursuing the opportunities. Alternatively, they may develop the less-complex KSUs at earlier grades and more-complex KSUs at later grades.

Given these statements, we hypothesized that nearly all academic KSUs required for postsecondary education and employment opportunities would be associated with meeting DLM achievement standards (i.e., At Target performance level) at various tested grades 3 through high school. Few if any academic KSUs required for postsecondary opportunities would be expected before grade 3 At Target or after high school At Target performance. We also predicted the academic KSUs would be distributed broadly across grades for all three subjects and for both employment and education opportunities.

These hypotheses may seem counterintuitive at first. Wouldn't we expect the academic skills needed for postsecondary education and employment to be associated with At Target performance in high school? Not necessarily. Postsecondary employment and education requires all adults to apply academic knowledge and skills that they develop throughout their K–12 education. For example, the most basic operations required to balance a checkbook—addition and subtraction—are learned in earlier grades. Students learn to apply addition and subtraction skills in more-complex contexts in later grades, signifying they are ready to use those skills in a different context. For example, a student who uses addition to calculate perimeter can apply that skill during employment in landscaping or event setup and management.

In this study, academic skills associated with At Target performance in lower grades indicate less-complex applications of the skills. For students who may pursue postsecondary opportunities, these skills represent the first access points that require less-complex applications of the skills. Given the vertical alignment of DLM content and achievement standards, students who achieve At Target in lower grades are expected to continue their learning in subsequent grades and be ready for more-complex applications of the academic skills by the time they transition into postsecondary education and employment. Thus, our hypothesized distributions would indicate that students who achieve At Target are ready to pursue a range of postsecondary opportunities, not just the most challenging opportunities available. Providing access to a range of opportunities is important for the heterogeneous

population of students who take DLM assessments, so they have a chance to continue developing their skills while pursuing postsecondary opportunities.

Organization of the Report

Chapter 2 of this report provides an overview of the DLM assessment system design, as background to support interpretation of the contents of later chapters. Chapter 3 describes the evidence for vertical alignment and vertical articulation. Chapter 4 summarizes the methods and results for the study that yielded the academic skills needed to pursue postsecondary opportunities (panel 1). Chapter 5 summarizes methods and results for the panel study that yielded evaluations of how academic KSUs related to DLM achievement standards (panel 2). Chapter 6 summarizes and interprets the evidence in light of the peer-review criterion and the DLM theory of action.

2. Dynamic Learning Maps Assessment System Design

The Dynamic Learning Maps® (DLM®) Alternate Assessment System is an instructionally relevant system that supports student learning and measures what students with significant cognitive disabilities (SCD) know and can do in ELA, mathematics, and science. The DLM Alternate Assessment System uses Essential Elements (EEs), specific statements of knowledge, skills, and understandings (KSUs) linked to the grade-level expectations identified in college and career-readiness standards. The DLM Alternate Assessment System assesses student achievement in ELA, mathematics, and science for students with SCD in grades 3–8 and high school.

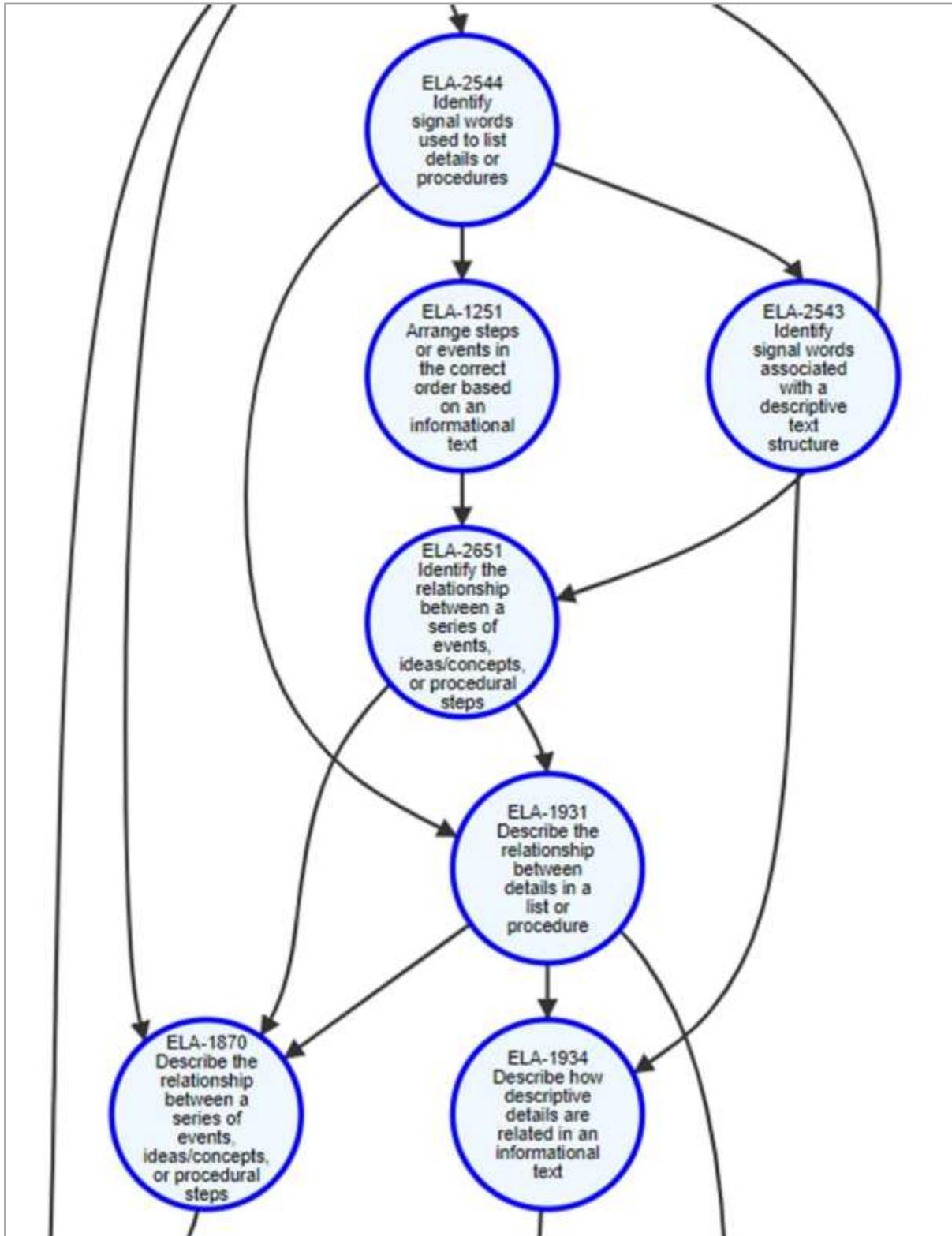
The purpose of this chapter is to provide the reader with an overview of the assessment system as background to help interpret information in later chapters. The assessment model for ELA and mathematics differs from science, so the models are described separately.

ELA and Mathematics

The ELA and mathematics assessment system is built on learning map models that are highly connected representations of how academic skills are acquired as reflected in research literature. Nodes in the maps represent specific KSUs in ELA and mathematics, as well as important foundational skills that support student learning of the targets associated with grade-level content standards. The maps go beyond traditional learning progressions to include multiple and alternate pathways by which students may develop content knowledge and skills.

Seen in its entirety, the DLM map is highly complex. Figure 2.1 displays a section of the ELA map, with circles representing the nodes and lines representing the connections between the nodes. As of October 2017, there are more than 4,400 nodes and 10,000 connections included in the learning map models for ELA and mathematics.

Figure 2.1
Sample Excerpt From an ELA Learning Map



ELA and Mathematics Essential Elements

DLM assessments balance the need to provide access to grade-level content at an appropriate level of complexity while maintaining challenge and academic rigor for students with the most significant cognitive disabilities. The EEs are represented within the learning map model. Since the EEs and maps are the underpinnings of the delivery of testlets, the DLM Alternate Assessment System gives fine-grained information about student mastery so that results can inform classroom decisions.

The EEs specify academic targets for students with the most significant cognitive disabilities, while DLM maps clarify the ways in which students can reach those targets. For each EE, linkage levels are identified as assessment targets. In ELA and mathematics, assessment items are written to five linkage levels: Initial Precursor, Distal Precursor, Proximal Precursor, Target, and Successor.

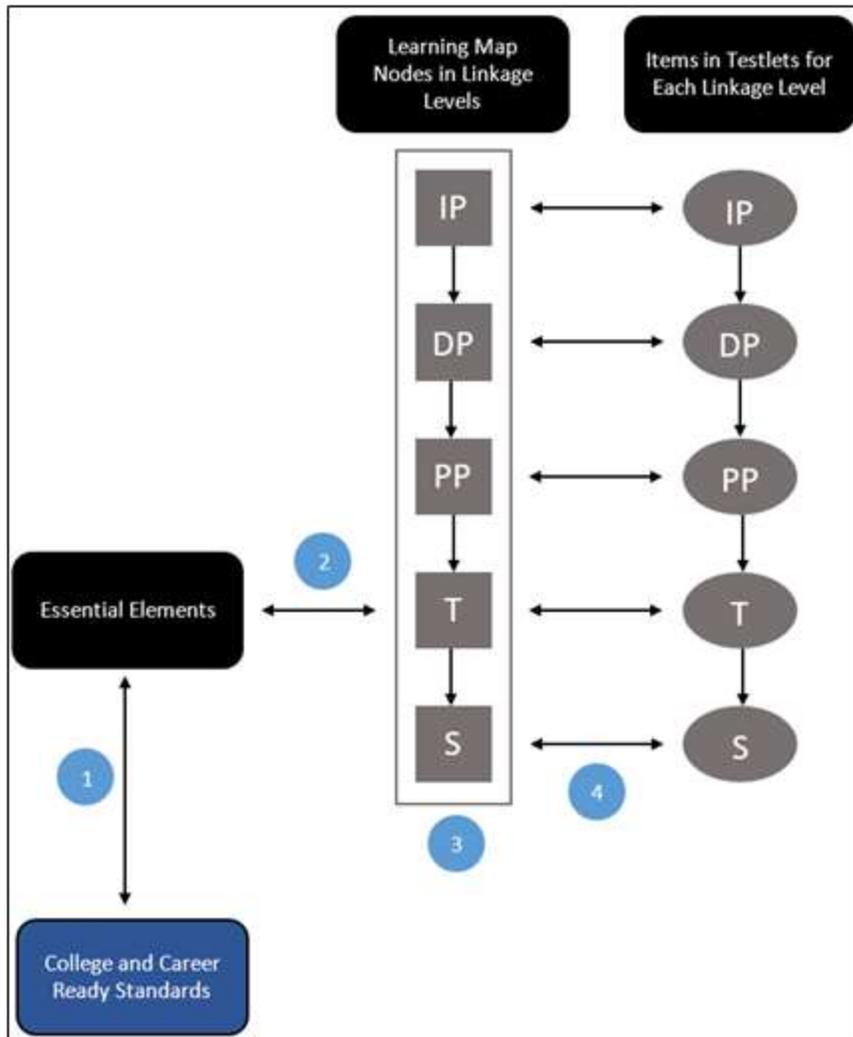
Assessments are available at each linkage level for the EE. The Target linkage level aligns to the EE. For ELA and mathematics, each of the three Precursor linkage levels aligns to a skill that precedes the Target linkage level. For ELA and mathematics, the Successor linkage level follows the Target and represents a next step beyond the skill described within the EE. The availability of assessments at all linkage levels allows students to show what they know and can do at different levels of complexity, while maintaining a connection to the grade-level expectation and fulfilling the on-grade requirements described by both the Elementary and Secondary Education Act and the Individuals with Disabilities Education Act.

Overall Structure of the Assessment System for ELA and Mathematics

The overall structure of the DLM Alternate Assessment System in ELA and mathematics has four key relationships between system elements (see Figure 2.2):

1. college- and career-readiness standards and EE for each grade level
2. an EE and its target linkage level
3. relationships between linkage levels for an EE
4. DLM map linkage levels and assessment items

Figure 2.2
 Relationships in the DLM Alternate Assessment System for ELA and Mathematics



Note. IP = Initial Precursor; DP = Distal Precursor; PP = Proximal Precursor; T = Target; S = Successor.

The DLM alternate assessment is delivered as a series of testlets, each of which contains an unscored engagement activity and three to nine items. Assessment items are written to align to a linkage level and are clustered into testlets.

The consortium partner states selected a subset of the published EEs for inclusion in the test blueprint. Between 10 and 14 EEs are tested in each grade in ELA, and six to eight EEs are tested in each grade in mathematics. These assessments are used for accountability purposes, and testlets are available for all EEs included in the blueprint for grades 3 through 11. The research-based principles that guided the development of the blueprints in ELA and mathematics include:

- use of the learning map model to prioritize content that has the potential to maximize student growth in academic skills across grades
- use of knowledge of academic content and instructional methods to prioritize content that is considered important by stakeholders and central to the constructs identified in the Common Core State Standards
- prioritization of content that can be applied to real-world or workplace problems

Assessments are available at each linkage level for the EE included on the test blueprint in each subject area. Test blueprints cover a broad range of academic content, connect skills across grades, and maximize student learning. Test blueprints identify EEs to be assessed and requirements for blueprint coverage. Students achieve blueprint coverage by taking testlets that correspond to EEs.

Instructionally Embedded Assessment Model

The instructionally embedded ELA and mathematics assessments consist of a test blueprint in which teachers may choose within some of the claims the EEs that best align to the content a student is learning. In both the fall and spring instructionally embedded test windows, teachers may choose the order in which the testlets are administered, ideally at the end of instruction of content aligned to specific or groups of EEs. The system recommends a testlet linkage level (i.e., difficulty) according to students' needs, but teachers may adjust the recommended linkage level up or down if the testlet linkage level is not appropriate for the student. The full test blueprint is covered in both the fall and spring instructionally embedded windows, and student performance on all testlets taken in both windows contributes to the student's final performance level.

Science

The DLM science alternate assessment supports students with SCD as they learn science content standards. End-of-year assessments were developed for each grade band (i.e., elementary, middle, high school), as well as an end-of-course assessment in high school biology.

Three **domains** identify the major disciplinary areas of interest within science for students with the most significant cognitive disabilities: physical science, life science, and Earth and space science. **Core ideas** further define specific ideas within the domains and serve as the base of core knowledge and competencies expected for students with the most significant cognitive disabilities. Each core idea includes one to three topics. **Topics** are more specific statements of core knowledge and competencies and serve as an organizing structure for the DLM EEs in science. The domains, core ideas, and topics provide a framework for the development and organization of the EEs.

Science Essential Elements

EEs for science were developed to reflect high expectations for students with the most significant cognitive disabilities. Priorities in participating states' current science content standards and *A Framework and for K–12 Science Education* (National Research Council, 2012) and Next Generation Science Standards informed development of the EEs.

Each science domain has three or four core ideas that are divided into subtopics consisting of disciplinary core ideas that progress across grade bands. Performance expectations for the 11 core ideas combine disciplinary core ideas, science and engineering practices, and crosscutting

concepts. The eight science and engineering practices are major practices scientists use to investigate the world and build systems. The seven crosscutting concepts link across domains to give students a better understanding of the world. DLM assessments include all but one science and engineering practice. To limit cognitive complexity to make content accessible for students with SCD, crosscutting concepts were retained only for instruction and not as learning targets.

The three linkage levels provide access to the EE with varying cognitive complexity. The EE is reflected in the Target linkage level, and the two levels below (Initial and Precursor) provide a pathway to the standard.

Overall Structure of the Assessment System for Science

The DLM science assessment is delivered as a series of testlets, each of which contains an unscored engagement activity and three to four items that align to a single linkage level. Assessment items are written to align to one of the three linkage levels.

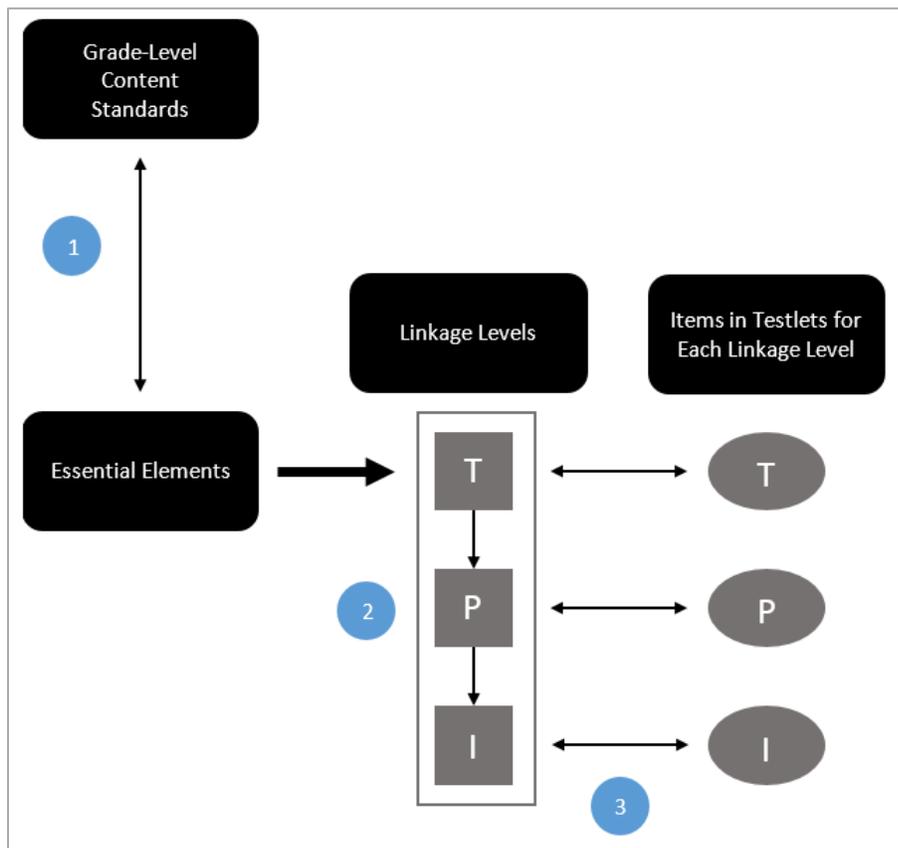
Assessment blueprints consist of EEs prioritized for assessment by the DLM Science Consortium. Nine EEs are assessed in each grade band, with 10 assessed in high school biology.

In the DLM science assessment system, each state defines its own testing window within the consortium-wide window that runs from mid-March through early June. During this window, all students are assessed on the entire blueprint. Each student is assessed at one linkage level per EE. The linkage level for each testlet varies according to student performance on the previous testlet. Student results are based on evidence of mastery of the linkage levels for every assessed EE.

Figure 2.3 summarizes the relationships between elements of the DLM science assessment system.

1. EEs are alternate content standards based on the K–12 framework for science and aligned with Next Generation Science Standards.
2. Each EE has three linkage levels. The Target linkage level reflects the grade-band expectation aligned directly to the EE. The Initial and Precursor linkage levels support a progression toward mastery of the Target linkage level.
3. Each linkage level has testlets that include an engagement activity and associated items that are grouped together. Each student's assessment contains a series of testlets.

Figure 2.3
Relationships in the DLM Alternate Assessment System for Science



Note. IP = Initial Precursor; DP = Distal Precursor; PP = Proximal Precursor; T = Target; S = Successor.

Science test blueprints were developed using several criteria to prioritize EEs that are valued for the student population and that have the potential to support high student attainment and growth. The DLM science blueprint includes a total of 37 EEs, nine at each grade band plus an additional 10 EEs for high school biology. The final set of EEs included on the blueprint represent a breadth of content coverage across 10 disciplinary core ideas, 14 topics, and seven science and engineering practices.

Science Assessment Model

The science assessment reflects the practice of traditional spring state summative assessments. The test blueprint is fulfilled automatically by the adaptive system during the spring testing window. Testing is normally completed over multiple settings depending on the needs of the student. Students will take either a series of nine or 10 testlets, depending on grade band, or the high school end-of-instruction biology assessment. The initial testlet linkage level (i.e., difficulty) is based on students' needs, and the system adapts the linkage level between testlets according to student performance on the previous testlet.

Scoring in Dynamic Learning Maps Assessments

Because of the assessment structure, all DLM assessments are scored using diagnostic modeling (see Chapter 5 of DLM Consortium, 2019). Scoring is based on linkage-level mastery rather than the total number of correct items. Students are considered masters of a linkage level if they have at least a .80 probability of mastery, as calculated through statistical modeling. Two additional scoring rules are applied: students are considered a master if they respond correctly to at least 80% of items on the testlet, or, if mastery is not demonstrated at the assessed linkage level, mastery is assigned two levels below. For each EE, scoring determines the highest linkage level mastered. Student achievement in the subject is based on the total number of linkage levels mastered. Performance is described using four levels: Emerging, Approaching the Target, At Target, and Advanced. The cut points were set during standard-setting events described in Chapter 3 of this report. Students are considered to have met proficiency when they achieve At Target or higher. Grade- and content-specific performance level descriptors (PLDs) describe the KSUs that students typically demonstrate at each performance level by grade and subject.

3. Vertical Alignment Evidence

The U.S. Department of Education peer-review guidance for statewide assessment systems requires evidence that alternate academic achievement standards are aligned so that students who meet the standards are on track to pursue postsecondary education or competitive integrated employment (Critical Element 6.3; see Office of Elementary and Secondary Education, 2018).

The Dynamic Learning Maps® (DLM®) Consortium submitted vertical alignment evidence with the initial peer-review submissions in 2015 (ELA and mathematics) and 2016 (science). That evidence was sufficient to meet the peer-review criteria at the time and no additional evidence was required.

This chapter summarizes the evidence from the original submissions, including vertical alignment of assessment content and vertical articulation of achievement standards. Evidence is differentiated for ELA and mathematics, which are based on learning map models; and science, which is not. More detailed descriptions are provided in the original technical manuals (DLM Consortium, 2016, 2017).

Vertical Alignment for ELA and Mathematics

Academic achievement standards for DLM ELA and mathematics assessments are grounded in grade-level Essential Elements (EEs) and their association to the underlying DLM maps. When EEs were first developed they were aligned with general education college and career-readiness standards for the same grade. EEs were later reviewed and revised as needed to confirm they increased in complexity across grades.

The vertical progression of academic skills measured by DLM ELA and mathematics assessments is directly reflected in the underlying map structures. There is also vertical progression of content within grades, as learning map nodes are grouped into linkage levels that provide access to the EE at five levels of complexity. Maps were designed to articulate the set of skills spanning from foundational preacademic skills to college- and career-ready skills. When nodes were selected for linkage levels, content teams confirmed increasing complexity across linkage levels within a grade, as well as increasing complexity in related linkage levels across grades. Empirical evidence of linkage level ordering was collected during the fall 2013 pilot administration, where items in testlets at higher linkage levels were more difficult than those in lower linkage level testlets (Clark et al., 2014). Chapter 2 of this report further describes EE development and the learning map structure.

Nodes in the learning map model are measured by assessment items for an EE and linkage level. After the first operational administration in 2015, an external alignment study was conducted to evaluate four relationships: the alignment between the college- and career-ready standards and the EEs, the alignment between the EEs and their Target node(s) in the map structure, the progression of linkage levels within the EE (i.e., vertical alignment), and the alignment of nodes to assessment items (Flowers & Wakeman, 2016). Through panelist ratings of content and performance centrality, the study demonstrated an acceptable level of alignment between the college- and career-ready standards and the EEs, the EEs and their Target nodes in the map structure, the vertical alignment of linkage levels with an EE, and nodes and the assessments items. A total of 82% of ELA EEs and 96% of mathematics EEs were rated as progressing through linkage levels. Test-development teams addressed areas needing further

investigation. For example, the review identified some areas where additional nodes were required to fill in developmental steps between EEs across grades. New nodes were created when necessary and placed in appropriate areas of the map.

Vertical Alignment for Science

The DLM science EEs and related linkage levels were based on structures found in *A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (National Research Council, 2012) and the Next Generation Science Standards (National Research Council, 2013). Experts drafted science EEs according to priorities identified in several states' existing science alternate assessments. EEs were developed to increase in complexity across grades. Linkage levels also increase in complexity. Linkage level ordering was empirically checked by evaluating EEs for (a) expected patterns of attribute mastery across linkage levels, and (b) lower weighted average *p* values at higher linkage levels (Thompson & Nash, 2019). Chapter 2 of this report further describes science EE and linkage-level development.

After the first operational administration in 2016, an external alignment study was conducted to examine relationships among the science content structures (Nemeth & Purl, 2017). The alignment study focused on three areas: EE alignment to general content standards, the vertical alignment of linkage levels, and the alignment of testlets to linkage levels. Overall, the study provided evidence to support alignment within the DLM science assessment system as 88% of the established alignment criteria were met. This includes the criterion for alignment of the vertical alignment of linkage levels, which was that 90% or more of the panelists' transition ratings indicated a progression in skills, knowledge, and/or cognitive demand across adjacent levels.

Vertical Articulation of Achievement Standards

DLM assessments describe student achievement on the EEs using four performance levels. Panelists specified cut points for the four achievement levels using a mastery profile approach (Clark et al., 2017). Panelists recommended ELA and mathematics achievement standards at a standard-setting event in June 2015. Panelists recommended science achievement standards at an event in June 2016 for then-tested grades: 4, 5, 6, 8, high school general science, and high school biology. The remaining science achievement standards were set for grades 3 and 7 in May 2019.

Mastery Profile Method for ELA and Mathematics

Because the DLM system is based on fine-grained learning map models and uses diagnostic classification modeling to determine students' mastery status for each assessed linkage level, the DLM Consortium selected a content-based standard-setting approach using mastery profiles. Student-performance data were used to create exemplar profiles for each subject and grade, as shown in Figure 3.1. Profiles contained a row for each EE on the blueprint (between eight and 20) and columns displaying the text of each linkage level. The total number of linkage levels possible was determined by multiplying the number of rows by the number of columns. Green shading was used to indicate mastery of the linkage level(s) for each EE. A computer program examined all mastery profiles occurring in the data to determine the three most common profiles for each possible total number of linkage levels mastered by grade and subject. Those most common profiles were used for standard-setting panel events.

Figure 3.1
Exemplar ELA Mastery Profile From Standard-Setting Event

End of Year Learning Profile						
SUBJECT: English Language Arts		GRADE: 7			YEAR: 2014-15	
MODEL: Integrated		PROFILE ID: 000117			LL: 40	
Area	Essential Element	Level Mastery				
		Initial Precursor	Distal Precursor	Proximal Precursor	Target	Successor
ELA.C.1.2	ELA.RL.7.1	Differentiate between text and pictures	Identify characters, setting, and major events	Identify words that answer explicit questions	Identify where explicit information is stated and where inferences can be drawn	Identify explicit and implicit information
ELA.C.1.2	ELA.RL.7.2	Match a picture representation with a real object	Identify concrete details in a familiar story	Identify main idea	Identify events related to the theme of a story	Identify events relevant to the theme or central idea
ELA.C.1.3	ELA.RL.7.3	Identify descriptive features and words	Relate character feelings to actions	Identify a character's response to a challenge	Understand the relationship between story elements	Associate a character's actions with their causes
ELA.C.1.2	ELA.RL.7.4	Understand words for absent objects and people	Identify definition of words	Identify word meaning of multiple meaning words using context clues	Determine the meaning of idioms and figures of speech	Determine the connotative meaning of words and phrases
ELA.C.1.3	ELA.RL.7.5	Differentiate between text and pictures	Identify the beginning and end of a familiar story	Identify text structure	Identify the structural similarities of multiple texts	Identify the structural similarities and differences of multiple texts
ELA.C.1.2	ELA.RI.7.1	Differentiate between text and pictures	Identify illustrations for a familiar text	Identify words related to explicit information	Identify explicit information and the need to make implicit associations	Recognize the difference between direct statements and inferences
ELA.C.1.2	ELA.RI.7.2	Match a picture representation with a real object	Identify concrete details in an informational text	Identify the implicit main idea in an informational text	Identify multiple main ideas in an informational text	Summarize a familiar informative text
ELA.C.1.3	ELA.RI.7.3	Draw conclusions from category knowledge	Identify the key points made in a text	Identify related points in an informational text	Understand the relationship between individuals, events, and ideas	Understand the interaction of text details
ELA.C.1.2	ELA.RI.7.4	Identify descriptive features and words	Recognize the literal meaning of a word or phrase	Determine the meaning of phrases using context	Determine how word choice persuades or informs	Determine the connotative meaning of words and phrases

Levels mastered this year

Page 1 of 2

Educators from consortium partner states with subject-matter and population expertise participated as panelists. Panelists used content-based judgments of the mastery profiles to specify cut points during rounds of range-finding and pinpointing exercises. During range finding, panelists used profiles for students who mastered a range of linkage levels in five-number increments. After the panelists determined an approximate cut point, profiles with linkage levels mastered adjacent to that number were used in the pinpointing exercises. Panelists discussed their content-based ratings in the context of the mastery profiles. Regression analyses were used to identify the cut points for the four performance levels. Statistical adjustments were applied to smooth distributions across grades. Impact data were generated to show the percentage of students achieving at each performance level according to the cut points. Cut points and impact data were shared with the DLM Technical Advisory Committee and DLM state partners. The state partners accepted the recommended cut points as final. Karvonen et al. (2015) provide a complete description of the standard-setting method and results.

Mastery Profile Method for Science

Science standard setting followed the same mastery profile approach used in ELA and mathematics. Because of differences in assessment design (see Chapter 2), science mastery profiles contained three linkage levels per EE instead of five. Science panel selection, training, materials, and rating steps were similar to those used for ELA and mathematics.

The 2016 science standard-setting event also included a vertical articulation panel, during which panelists evaluated the raw and statistically adjusted cut points across grades to determine if any of the cut points should be changed. The panel representatives made content-based recommendations on whether the cut points were appropriate and logical across grades. The representatives used these criteria to recommend adopting all statistically adjusted cut points, except one, for which the raw value was recommended. Cut points and impact data were shared with the DLM Technical Advisory Committee and DLM state partners. The states accepted the 2016 panel-recommended cut points as final. Nash et al. (2016) provide a complete description of the 2016 science standard-setting method and results.

Achievement standards for grades 3 and 7 science were set in 2018–2019. Cut-point values were proposed according to existing cuts in adjacent grades rather than by range-finding and pinpointing exercises. Panelists evaluated the proposed grade 3 cut points using mastery profiles. After they agreed on cut points, panelists viewed impact data and were given a chance to revise recommendations. Cut points for grade 7 were not determined by a panel, but instead were based on the existing cut points in grades 6 and 8 because of how close the existing cut points were to one another. Student-performance data were used to create exemplar profiles for each subject and grade, as shown in Figure 3.2. The DLM Technical Advisory Committee reviewed the cut points and standard-setting process for each grade. State partners reviewed the proposed cuts before accepting them. Nash et al. (2019) provide a complete description of the 2019 science standard-setting method and results.

Figure 3.2
Exemplar Science Mastery Profile From Standard-Setting Event

End of Year Learning Profile



SUBJECT: Science **GRADE:** Middle school science **YEAR:** 2015-16
MODEL: Year-End **PROFILE ID:** 0122 **TOTAL LL:** 14

Essential Element	Level Mastery		
	1	2	3 (Target)
SCIMS.PS.1.2	Identify change	Gather data on properties before and after chemical changes	Interpret data on properties before and after chemical changes
SCIMS.PS.2.2	Identify ways to change movement	Investigate and identify ways to change motion	Investigate and predict changes in motion
SCIMS.PS.3.3	Identify objects and materials that minimize thermal energy transfer	Investigate objects/materials and predict changes in thermal energy transfer	Refine a device to minimize or maximize thermal energy transfer
SCIMS.LS.1.3	Recognize major organs	Model how organs are connected	Make a claim how structure and function support survival
SCIMS.LS.1.5	Match organisms to habitats	Identify factors that influence growth	Interpret data to show that resources influence growth
SCIMS.LS.2.2	Identify food that animals eat	Classify animals by what they eat	Identify producers and consumers in a food chain
SCIMS.ESS.2.2	Identify differences in weather conditions from day to day	Identify geoscience processes that impact landforms	Explain how geoscience processes change Earth's surface
SCIMS.ESS.2.6	Interpret weather information to identify conditions	Interpret weather information to compare conditions	Interpret weather information to make predictions
SCIMS.ESS.3.3	Recognize resources that are important for life	Recognize ways that humans impact the environment	Monitor and minimize an impact on the environment

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

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Grade- and Content-Specific Performance Level Descriptors

Standard-setting methods often used for scaled assessments (e.g., bookmark) rely on grade- and content-specific PLDs written before the standard-setting panel to inform panelist decisions about placement of cut scores. In contrast, with a mastery profile approach, grade- and content-specific PLDs are developed after the standard-setting panel according to the accepted cut points and other information about the underlying content.

After panelists recommended cut points during the standard-setting event, they used the linkage-level statements in the mastery profiles to assemble lists of skills typically demonstrated by students achieving at each performance level. DLM test-development teams, with expertise in each subject area, used the panelist-generated lists and additional materials to develop language for grade- and content-specific PLDs. In addition to lists assembled by panelists, test-development teams used these materials:

- blueprints
- accepted cut points
- exemplar mastery profiles used during standard setting
- Essential Element Concept Maps for each EE on the blueprint
- extended linkage-level descriptors
- sections of the DLM maps (ELA and mathematics only)
- *The Standards for Mathematical Practice* (Common Core State Standards Initiative (n.d.); mathematics only)

Test-development teams reviewed the EEs, Essential Element Concept Maps, and linkage-level descriptors to determine skills and understandings assessed at each grade level. These skills and understandings increase in complexity from one grade to the next. Next, teams reviewed the panel-generated skill lists and cut points. The teams then used the sample mastery profiles to consider the types and ranges of student performances that could yield specific performance levels. The synthesis of standard-setting panelist judgments and content-team judgments provided the foundation for descriptions of typical performance associated with mastery at each performance level. As content teams drafted PLDs for each grade, they reviewed the PLDs in relationship to each other (and, in ELA and mathematics, to the underlying learning map models) to ensure differentiation in skills at the same performance level from one grade to the next.

While in general skills build in complexity across grades, sometimes those progressions are not immediately evident in the PLDs across grade levels. This is because the PLDs are expressions of KSUs *typically* mastered by students achieving at a particular level and because of variations in the emphases of the blueprints across grades. Not all students achieving at the level demonstrate all skills, and they may demonstrate other skills beyond those listed in the PLDs.

The grade- and content-specific PLDs were finalized after a period of review by state education agencies, subsequent revision by test-development teams, and an editorial review.

4. Identifying Postsecondary Opportunities and Academic Skills

This chapter describes the process used to identify postsecondary education and employment opportunities, and the associated academic skills required to fulfill duties for those opportunities. During a one-day event, a panel of educators and researchers used their professional experience and background knowledge to collectively identify postsecondary opportunities; and the knowledge, skills, and understandings (KSUs) required to fulfill those opportunities; and the academic skills within the KSUs. After the event, subject-matter experts reviewed and refined the academic skill statements.

Purpose and Study Overview

The purpose of this portion of the study was to identify the kinds of academic skills that students with significant cognitive disabilities (SCD) need to pursue a range of postsecondary employment and education opportunities. We grounded the work in the opportunities and skills framework that we developed from existing literature (see Chapter 1). We recruited a panel of individuals with expertise in the population and in postsecondary transition to first identify the types of educational and employment **opportunities** currently available to students with SCD and those that may be more aspirational (i.e., new opportunities that may become available as a result of the Workforce Innovation and Opportunity Act requirements; see Chapter 1). The goal was to identify a broad sampling of opportunities, not an exhaustive list. The panelists then identified the **responsibilities** associated with those opportunities. Responsibilities are the duties necessary to pursue the opportunity. Finally, panelists identified the kinds of **KSUs** needed to fulfill those responsibilities. We asked panelists to especially focus on identifying **academic** KSUs, which we call **academic skills** to distinguish from broader KSUs throughout this chapter.

An illustration of the relationship between these concepts is in Figure 4.1. A veterinary assistant may have responsibilities including cleaning, performing clerical tasks, and feeding and bathing animals. Each responsibility is fulfilled using one or more KSUs. Some KSUs require academic skills (noted with asterisks in the figure). For example, to fulfill the responsibility of monitoring animals' feeding, a veterinary assistant would need to know how to record data in a chart, a mathematics skill.

Figure 4.1
Example Opportunity; Responsibilities; and Knowledge, Skills, and Understandings (KSUs)

Opportunity: Veterinary Assistant	
Responsibilities	KSUs
Clean room, cages, and equipment. Perform clerical tasks. Feed animals and monitor whether they are eating. Bathe pets.	Know how to determine if [cage, equipment] is clean. Record amount of food eaten. <ul style="list-style-type: none"> • Record data in an existing chart (e.g., numerical data)*. Know which food goes for which animal. <ul style="list-style-type: none"> • Classify items by common attributes*. • Identify when animals need food and shelter*. Check water temperature. <ul style="list-style-type: none"> • Read scale on a thermometer to measure temperature*. Know how to wet, soap, rinse, and dry. Determine the appropriate cycle for cleaning various animals*.

Note: Asterisks indicate academic KSUs.

Because the panelists had population expertise rather than academic-content-specific knowledge, and because the academic skills were to be used in a subsequent panel to evaluate their relationship to Dynamic Learning Maps® (DLM®) performance level descriptors (see Chapter 5), we recruited subject-matter experts to review and refine the panel-generated academic statements for accuracy and continuity.

Methods

We describe methods for the on-site panel event, subsequent data processing, and subject-matter expert review of KSUs to produce final academic skill statements.

Panel

Panelists were recruited for an on-site event that included four phases: (a) training; (b) panel activities to identify postsecondary employment and education opportunities, responsibilities, and KSUs including academic skill; (c) an evaluation questionnaire, and (d) post-meeting-day steps to identify remaining KSUs.

Participants

We recruited professionals with experience in secondary transition, postsecondary employment and/or education, and competitive integrated employment to participate in the one-day event. State education agency staff from DLM partner states provided names of five individuals with experience in secondary or postsecondary employment settings through vocational rehabilitation agencies, community-based employment and independent living agencies, existing postsecondary education programs, and state advisory panels. Research team members submitted names of another nine individuals with expertise as evidenced by scholarly publications or recognition in the fields of secondary transition, postsecondary education or employment, or education of students with SCD.

Fourteen email invitations to complete an eligibility survey were sent. Three people responded affirmatively to the eligibility survey, four responded that they could not attend, one declined but recommended a panelist in her place who was sent the survey and responded that she could attend. The remaining six did not respond. The invitation email was then shared with national email lists for the Council for Exceptional Children’s Division on Career Development and Transition and the Division on Autism and Developmental Disabilities. From these lists, an additional eight individuals completed the eligibility survey. Three of these individuals whose background and experience met panel needs were selected, along with the four earlier affirmative responders to the eligibility survey. One panelist dropped out before the meeting. Table 4.1 summarizes the remaining six panelists’ professional roles and years of experience. Panelists had between five and 29 years of experience.

Table 4.1
Panelists’ Role, Experience, and State of Residence

Current role	Years of experience with population	State
District transition specialist	29	Wisconsin
National transition specialist	25	Oklahoma
University faculty/staff	23	Tennessee
Special education teacher	14	Illinois
University faculty/staff	10	Kansas
University faculty/staff	5	North Carolina

Table 4.2 identifies the number of participants with the specified expertise in working with individuals with SCD. All panelists had experience teaching or providing professional development to other individuals who work with students with SCD.

Table 4.2
Panelists' Expertise (N = 6)

Expertise category	<i>n</i>
High school	
Teaching academic content	4
Teaching transition skills	4
Postsecondary	
Teaching transition skills	4
Teaching academic content	3
Teaching independent living/life skills	1
Other	
Teaching or providing professional development to individuals who work with students with significant cognitive disabilities	6
Transition planning	4
Vocational training	4
Job placement	3
Job development	3
Transition assessment	3
Job coaching	2
Employer of students with significant cognitive disabilities	1
Law/policy	1

Panel Facilitators

Three staff members from Accessible Teaching, Learning, and Assessment Systems (ATLAS) cofacilitated the event. One had more than 20 years of experience facilitating focus groups and panel-type studies (e.g., alignment, standard setting) and 20 years of experience in alternate assessment. Another had more than 18 years of experience managing federal program activities, including facilitation of multiple partners, data collection and analysis, and reporting, as well as experience leading research teams. The last staff member had more than 15 years of experience in special education, with five years of experience in alternate assessment, expertise in secondary transition, and five years of experience teaching students with SCD. A fourth staff member with expertise supporting meetings and special events provided technical support and managed the meeting software, materials, and recording.

Training

The one-day, on-site panel meeting began with training to orient panelists to (a) the DLM assessment system and students with SCD, (b) the WIOA, and (c) competitive integrated employment. Panelists viewed a series of video clips portraying individuals with SCD in employment settings in a library, hospital, and medical device company. At the conclusion of each clip, panelists identified the KSUs individuals would need to perform the job shown. Participants were then led through a discussion of academic skills versus adjacent skills, which we defined as skills that might be related to academic skills but are not truly academic. These include skills such as choice making, self-care, time management, and self-regulation.

Panelists were introduced to the opportunities and skills framework (Figure 1.2) to continue orienting participants to the task of identifying academic skills and differentiating them from nonacademic skills. Since some panelists had more expertise in transition and postsecondary

options for students with mild to moderate disabilities, we provided more examples of the population of students who take the DLM alternate assessment by showing a video of secondary students with SCD to anchor panelists' thinking to the intended population of students with SCD (WebsEdge Science, 2019).

Identification of Postsecondary Opportunities

After training, panelists shared various opportunities individuals with SCD pursue within their communities, which facilitators wrote on chart paper. Panelists also shared aspirational opportunities, in other words, those that students with SCD may not have full access to now but may be able to in the future as expectations increase and barriers are removed. The goal was to identify a sampling of potential opportunities available to students with SCD, not an exhaustive list.

Figure 4.2 lists all 57 identified employment opportunities; aspirational opportunities are bolded. Identified employment opportunities spanned the sectors of agriculture, business, arts, education, health sciences, hospitality, information technology, manufacturing, and transportation, as defined by the Advance CTE (2020 career clusters. Example opportunities included veterinary assistant, data entry clerk, baking assistant, receptionist, and farmhand. Appendix 4.A lists opportunities with their primary sector.

Figure 4.2
Identified Postsecondary Employment Opportunities

Employment opportunities	
Administrative clerk	Hospital guide
Artist ^a	IT programmer ^b
Assembly line worker	Jewelry maker
Assistant coach	Landscaper
Audio visual assistant ^b	Library aide
Auto detailer	Lyft driver ^b
Auto porter	Mechanic assistant
Automotive assistant*	Motivational speaker ^a
Baking assistant	Musician
Certified medical assistant ^b	Paper shredder (self-employed)
Certified nursing assistant ^b	Patient transportation assistant
Childcare worker	Pet sitter
Dairy farm assistant ^a	Photographer ^b
Data entry clerk ^b	Quality assurance assistant ^b
Delivery person (packages)	Receptionist
Dog walker ^b	Record scanner
Entrepreneur ^a	Recreational center assistant
Environmental services worker	Retail salesperson
Etsy merchant ^{a b}	Security assistant
Event setup assistant	Self-employed: salesperson (new items)
Farmhand	Self-employed: salesperson (resale items)
Flower shop assistant	Stock clerk
Food deliverer (app based) ^b	Surgical sterilization technician
Food preparer ^a	Teaching assistant
Food service worker	Vending machine attendant
Gamer (monetized) ^{a b}	Veterinary assistant
Greeter	Wildlife rescue worker
Handyperson	YouTuber ^b
Help desk technician ^{a b}	

Note. ^a opportunities that were initially identified but not carried forward in later panel activities because of time constraints. ^b aspirational opportunities for students with significant cognitive disabilities

Panelists also identified seven education opportunities: attendance at a college or university, community-based classes and workshops, vocational courses that lead to certification, apprenticeships, internships, lifelong learning/continuing education, and targeted education programs such as Project Search (<https://www.projectsearch.us/>).

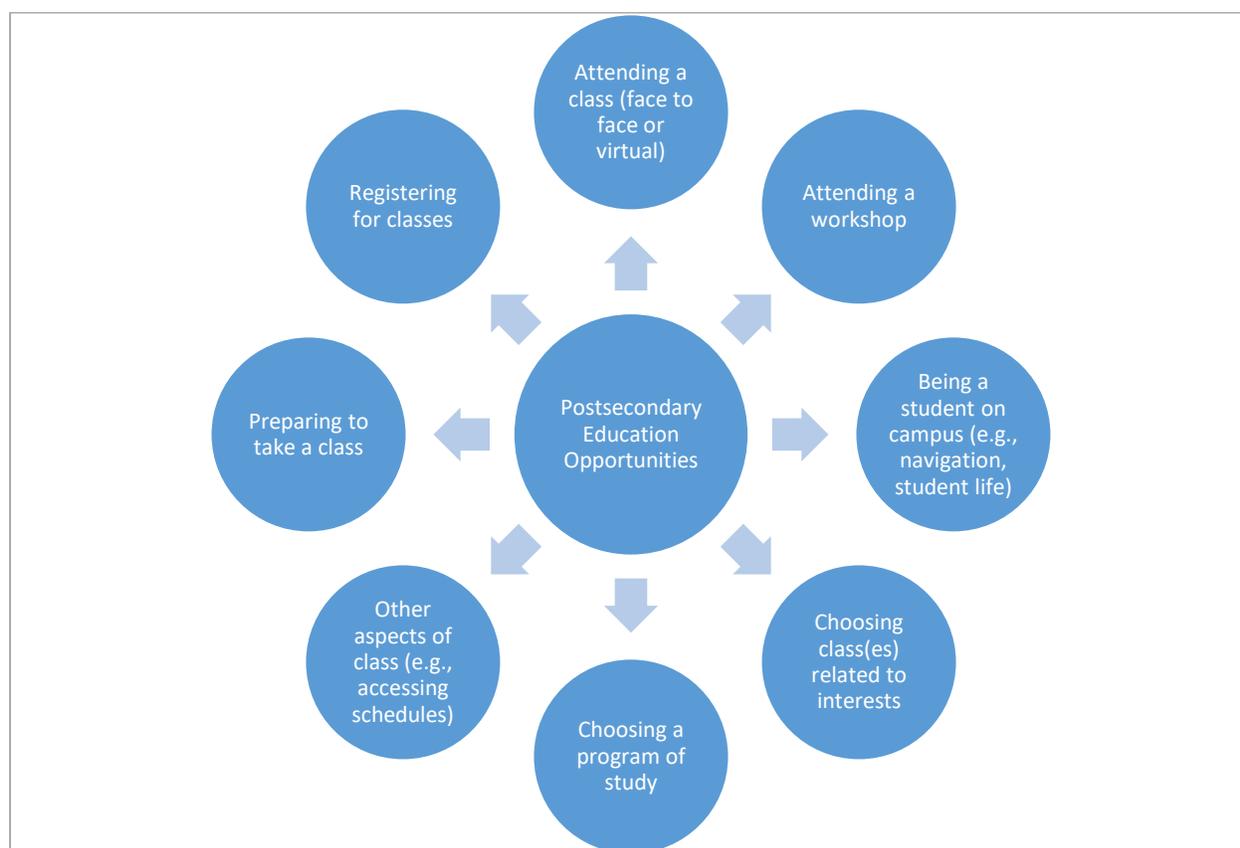
Responsibilities; Knowledge, Skills, and Understandings; and Academic Skills

To prepare for independent work, panelists first participated in a group practice activity where they identified key responsibilities; KSUs; and academic skills needed to pursue an employment opportunity as a barista in a coffee shop. Panelists first completed the activity independently. A facilitator then led group discussion to gauge whether panelists understood the link between identified responsibilities, KSUs, and academic skills. Participants discussed the key responsibilities that may be required to fulfill the role of a barista and a variety of KSUs the student may need to fulfill these responsibilities. Within the KSUs, the panel identified academic skills that might be necessary to fulfill the barista's responsibilities, such as understanding size and measurement, discriminating and measuring ingredients, and understanding methods of payment (which requires reading or deciphering skills, or both).

After the training activity, the panel discussed responsibilities for postsecondary education identifying eight responsibilities (see Figure 4.3) common across educational opportunities, regardless of type of class or setting and whether or not they were part of a degree or certificate program.

Figure 4.3

Responsibilities Common Across All Postsecondary Education Opportunities



Panelists identified employment responsibilities through independent work on each employment opportunity. Each participant self-selected eight of the 57 employment opportunities according to their familiarity with the type of position. There were no overlapping assignments; only one

panelist completed work for each selected opportunity. Panelists worked independently to complete templates identify key responsibilities, KSUs, and academic skills for each. The template they used included columns to identify the responsibilities, KSUs, and academic skills. The expectation was that the KSUs may include nonacademic skills as well, so the final academic skills column was to help them specify the academics within the KSUs. See Appendix 4.B for an example product from this activity. One panelist with a background in postsecondary education opportunities identified KSUs and academic skills associated with the education responsibilities (Figure 4.3). All panelists completed their independent work using paper copies or electronic versions of a template.

After 25 minutes of independent work on the first opportunity, facilitators paused for group discussion, including questions and clarification points, and to check progress. After the group discussion, participants continued to work independently, turning in the completed template for each opportunity as they finished it. Facilitators reviewed each submitted template to monitor completeness of KSUs and clarity of academic skill descriptions.

As panel facilitators reviewed the completed work, they noted that panelists repeatedly listed certain job-related KSUs that were not immediately recognizable as academic but where academic KSUs may be embedded. These included social skills, self-advocacy, setting or making a budget, critical thinking, and organizational skills. Through the rest of this report we refer to these as **soft skills**. To gather more information about what panelists intended when they identified the soft skills, facilitators convened a whole-group discussion to elaborate on the meaning of each term and recorded the responses on chart paper. For example, panelists identified topic choice, understanding context, sustaining conversation, asking complex questions, and listening comprehension as components of social skills. We retained the academic skills identified through this exercise and treated them the same as other academic skills identified on employment opportunity templates. Appendix 4.C includes a sampling of academic skills first identified as soft skills.

Postpanel Work

During the on-site event, panelists described academic skills for 33 of the 48 selected employment opportunities. Because panelists did not complete all work during the event, they identified the academic skills for the remaining 15 employment opportunities over the subsequent 3 weeks and emailed their completed work to facilitators. One panelist with experience in postsecondary education completed the task of identifying KSUs and academic skills related to the eight specific postsecondary education responsibilities identified in Figure 4.3.

Evaluation Survey

At the conclusion of the on-site meeting, five of the six panelists completed a postmeeting evaluation. Panelists rated their responses to the questions on a 4-point Likert scale, choosing from *strongly disagree*, *disagree*, *agree*, or *strongly agree*. Table 4.3 summarizes the responses. Overall, panelists provided high ratings for the quality of the meeting, its value, and their role in the process.

Table 4.3
 Number of Panelist Responses to Evaluation Items (N = 5)

Item	Strongly disagree	Disagree	Agree	Strongly agree
The overall goals of the panel meeting were clear.		1 ^a	4	
The panel meeting was well organized.			3	2
The background information and example(s) provided the information I needed to complete my tasks.		1 ^a	4	
Overall, I believe my opinions were considered and valued by the group.			1	4
Overall, the group's discussions were open and honest.				5
Overall, I believe the postsecondary opportunities we discussed covered the full range available for students with significant cognitive disabilities.			2	3
Overall, I believe the skills we discussed covered the full breadth necessary for students with significant cognitive disabilities to access postsecondary opportunities.			4	1
Overall, I believe the skills we discussed are reflective of what is currently taught to students with significant cognitive disabilities.	1	1		3
Overall, I valued the panel meeting as a professional development experience.			1	4

Note. ^a On the paper evaluations, *disagree* ratings had been marked on the line between *disagree* and *agree*.

Data Processing

After the meeting, researchers engaged in several iterations of data processing to be fully prepared for the next phase of the study. After postpanel assignments were completed, researchers transferred all data from separate worksheets per opportunity to a single spreadsheet to allow for sorting and organizing. One team member entered the data that were handwritten, and a second team member checked the entries against the original data sheets. When panelists chose to complete their worksheets electronically, those records were transferred directly to the master spreadsheet. Each component (i.e., opportunity, responsibilities, KSUs, academic skills) was entered into a separate column. For each opportunity, there were multiple rows of data with one row for each unique combination of responsibility and academic skill. Panelists identified multiple academic skills for some KSUs, as illustrated in Table 4.4. Finally, the soft skills and associated academic skills identified through group discussion (see Appendix 4.C) were included in the master spreadsheet.

Table 4.4
Example of Opportunity: Landscaper

Opportunity	Responsibility	Knowledge, skills, and understandings (KSUs)	Academic skills
Landscaper	Maintain equipment	Safety (eye care, fingers, heat, burns, long points [sharp objects], chemicals)	Chemical reactions
			Safety words
		Proportions of gas/oil mix	Proportions
			Formulas

Final Versions of Academic Skill Statements

To prepare for the next phase of the study, in which a panel reviewed the relationship between the academic skill statements and DLM PLDs (see Chapter 5), the final versions of academic skill statements needed to use consistent language to describe the same skill across multiple responsibilities; and be clear enough so a new panel could imagine someone demonstrating the academic skill without being so specific that the skill could only be applied in the context of a single postsecondary opportunity. We first conducted internal reviews of the academic skill statements to evaluate whether they were specific, consistent, and of a similar grain size. Given that many panelists had expertise in transition but not academics, some academic statements were unclear and others were incomplete. For example, the skills in Table 4.4 show the academic content but not what a person would be expected to do with that content. Internal project staff conducted a limited review process that led to some proposed revisions and expansions. To guard against developing final academic skill statements that contained language too close to that of the DLM Essential Elements (EEs) or PLDs, external subject-matter experts rather than project staff conducted the final review and revision of KSUs and academic skill statements. Internal and external review processes are described next.

Internal Review

First, an ATLAS research associate with experience teaching all content to middle school students with SCD and a research-project manager who taught all content to students with SCD in prekindergarten through grade 12 reviewed the opportunities, responsibilities, KSUs, and academic skills. Neither staff member had deep familiarity with the EEs or PLDs. Where needed, they restated the academic skills using their content background knowledge to ensure statements used consistent language and had equivalent grain size. They worked independently and met during two prescheduled meetings to compare, clarify, and review each other's work.

Next, one ATLAS test-development specialist from each subject (i.e., ELA, mathematics, science) reviewed all opportunities, responsibilities, KSUs, and academic statements for their subject area. Researchers instructed the specialists to review the academic statements to ensure they captured what the responsibilities and KSUs described across opportunities. Where

necessary, specialists reworded existing academic statements to capture what was described. They were also instructed to record any additional academic skills necessary to capture the full breadth of the opportunity, responsibilities, and KSUs provided by the panelists. They did not alter or delete any opportunity, responsibility, or KSU statements.

Subject-Matter-Expert Review

Three subject-matter experts with doctoral degrees in their content areas of expertise (i.e., ELA, mathematics, and science), and who were neither involved in DLM test development nor responsible for the panel study, completed a review of the opportunities, responsibilities, KSUs, and academic skills in the version of the data after test-development staff completed their review. Table 4.5 provides a description of each expert’s professional experience.

Table 4.5
Subject-Matter Experts’ Professional Experience

Subject-matter expert	Experience
ELA	Ph.D. in urban literacy curriculum and instruction Clinical assistant professor 22 years as a reading / ELA teacher Specific ELA content expert experience State alignment coding for content standards Alternate assessment design Statewide K–3 formative assessment
Mathematics	Ph.D. in mathematics education Associate researcher Nine years in mathematics education Specific mathematics content expert experience Alternate assessment design and development Instructional resource development Assessment-item review Mathematics instruction for preservice elementary teachers Curriculum development assistant
Science	Ph.D. in science curriculum and instruction Assistant professor of elementary science education 5 years of teaching high school biology 4 years of providing professional development to middle school science teachers 4 years of teaching elementary science methods courses Specific science-content-expert experience Provided feedback for Next Generation Science Standards Supervised undergraduate student teachers of high school science

The subject-matter experts reviewed every responsibility, KSU, and associated academic skill statements for whether the academic skill statements captured the responsibilities and KSUs described for each opportunity. They had access to the panelists’ original academic skill statements and (where applicable) revisions proposed by ATLAS staff. Using their professional judgment, subject-matter experts made several types of adjustments.

1. They determined whether the statements were specific enough to be observed in a workplace or educational setting. If not, they reworded academic skill statements.
2. They determined whether statements were written at a consistent grain size and with consistent language. When a skill was essentially the same across different opportunities and responsibilities, but the original skill statement language varied slightly, the subject-matter expert revised language so it was identical across opportunities.
3. Where academic skill statements were missing, the experts wrote statements based on the context that the responsibility and KSU(s) provided.
4. If the opportunity and responsibility did not have any obvious academic skills, the subject-matter expert indicated that the skill statements were not academic and provided a brief rationale.

Table 4.6 provides examples of the refinements the subject-matter experts applied across one responsibility for each of two separate opportunities. The academic skill lists were considered final after the external subject-matter experts finished their work and all statements were revised as needed, confirmed to be academic, or confirmed not to be academic.

Table 4.6

Example Academic Skill Statement Refinement Across Internal and Subject-Matter-Expert Reviews

Opportunity	Responsibilities	Knowledge, skills, and understandings	Panel 1 academic statement	Internal review academic statement	Final subject-matter expert academic statement	Subject
Baking assistant	Follow multistep directions.	Read recipe.	Vocabulary	Demonstrate knowledge of word meanings across multiple contexts.	Demonstrate knowledge of word meanings across multiple contexts.	ELA
		Use measuring instruments.	Ordinal/ratio	Express quantities of measurement.	Express quantities of measurement in appropriate units.	Mathematics
		Use measuring instruments.	Ordinal/ratio	Express quantities of measurement.	Use appropriate measuring tool/instrument to prepare the needed ingredients for a recipe.	Science
Veterinary assistant	Feed animals and monitor if animal is eating.	Know which food goes for each animal.	Describe and compare measurement attributes	Describe and compare measurement attributes.	Classify items by common attributes.	ELA
					Use graphs and charts to interpret data.	Mathematics
					Identify various pet foods according to physical properties (e.g., color, size, shape) and determine which food goes with certain animals.	Science

Results

Panelists identified responsibilities and academic skills for 48 employment opportunities, eight education responsibilities used across seven postsecondary education opportunities, and five broad skill sets. Table 4.7 displays the final number of employment and education opportunities, responsibilities, KSUs, and academic skills, by subject. Academic skills are presented both in terms of the percent of KSU statements that were confirmed to be academic by the end of the subject-matter expert review, and the number of unique (i.e., unduplicated) academic skills. ELA had far more academic skills across all opportunities than mathematics or science (454 ELA academic skills), but when looking at unique skills, ELA and mathematics were more similar ($n = 50$ and $n = 41$, respectively). Science had roughly three times as many unique skills ($n = 150$) as the other two subjects because the academic skills related to science were more context-specific. For example, “Decide what mixing method to use based on the properties of matter” is applicable for only one of the identified opportunities, whereas the mathematics skill “Add and subtract money” was identified across multiple opportunities.

Table 4.7 also shows the panel results disaggregated by employment and education, and for the subset of academic skills that were associated with the soft skills (e.g., self-advocacy). The skills are not additive within a subject because the same skills were identified across multiple education and employment opportunities, although there was less overlap in science.

Table 4.7

Summary of Opportunities, Responsibilities, and Academic Skills Across Subjects

Subject	Opportunities	Responsibilities	Total KSUs	Total academic skills (% of KSUs)	Unique academic skills
ELA	54	246	649	454 (70%)	50
Employment	46	205	478	369 (77%)	47
Education	8	41	141	76 (54%)	12
Soft skills	—	5	30	9 (30%)	8
Mathematics	55	184	392	289 (74%)	41
Employment	47	157	319	252 (79%)	40
Education	8	27	53	23 (43%)	7
Soft skills	—	3	21	15 (71%)	13
Science	52	159	298	279 (94%)	150
Employment	46	146	269	250 (93%)	144
Education	6	13	22	22 (100%)	6
Soft skills	—	4	7	7 (100%)	7
Total	55	286	1,340	1,023 (76%)	237

Note. KSUs = knowledge, skills, and understandings.

When subject-matter experts were unable to clarify or reflect an academic skill given the provided context of the opportunity, responsibilities, and KSUs, they were asked to provide a rationale. The most common reason for ELA (99%) and mathematics (82%) was that the KSU did not represent an academic skill. For example, in ELA, “understand rules,” “art skills around perspective [understanding art perspective],” and “identify problem” were all skills that the ELA

expert determined were nonacademic in the context of the opportunity. The mathematics expert determined “perform online bill payment” and “organizational skills” were not academic skills. In contrast, the most frequent reasons the science expert did not provide an academic skill was a lack of clarity given for the opportunity, responsibility, and/or KSUs (42%) or because more information was needed (32%). For example, “cause and effect” was identified as the academic skill several times, but the opportunity and responsibility did not provide enough contextual information to determine a specific academic skill to be evaluated.

Final Academic Skills

We retained all unique ELA and mathematics academic skills for the next phase of the study (see Chapter 5). Because of the number of science academic skills to be rated, anticipated time constraints for the next panel, and the similarity across some skills, we employed a sampling procedure to ensure adequate coverage of science skills to be rated in the next panel. Skills that did not have an identifiable domain (e.g., Earth and space science, biology; $n = 65$, 43%) were eliminated first. Next, skills that were also rated by the ELA or mathematics panels were eliminated. Of the remaining 78 skills, those that employed science and engineering practices (SEPs) were purposefully sampled to ensure a balance of domains within SEPs were represented. This resulted in 53 science skills to be rated in the next stage of this study.

Summary

This chapter describes the steps taken to identify postsecondary education and employment opportunities and the related academic skills needed to fulfill the responsibilities for these opportunities. Panelists with experience in secondary transition, postsecondary employment and/or education, and competitive integrated employment identified 57 example postsecondary employment opportunities and seven example postsecondary education opportunities for students with SCD. They then identified responsibilities associated with the opportunities and the KSUs required to fulfill those responsibilities. Finally, they identified academic skills within the KSUs. The panel identified academic skills within soft skills such as self-management. Subject-matter experts reviewed and revised the academic skill statements using several criteria so the final academic skill statements would be usable for the next panel. This process resulted in 50 ELA skills, 41 mathematics skills, and 53 science skills to be carried forward for the final phase of the study (described in Chapter 5).

5. Ratings of Academic Skills With Alternate Academic Achievement Standards

Purpose

This chapter describes the final phase of a study to evaluate the extent to which the Dynamic Learning Maps® (DLM®) alternate academic achievement standards meet this criterion: “The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment” (Office of Elementary and Secondary Education, 2018).

This phase of the study began with the academic skills needed to pursue postsecondary opportunities, as identified in the first panel (see Chapter 4, Final Academic Skills). These included 50 ELA skills, 41 mathematics skills, and 53 science skills. The second panel examined the relationship between the panel-identified academic skills and the kinds of academic knowledge, skills, and understandings (KSUs) typically associated with meeting the DLM alternate academic achievement standards (i.e., achieving At Target). This panel evaluated the **academic skills** and the **DLM performance level descriptors (PLDs)**. We used the PLDs instead of the Essential Elements (EEs, or extended content standards) because the PLDs are more directly related to the academic KSUs expected for students whose achievement is At Target on DLM assessments. (Content standards like EEs set expectations for what students should learn in each grade, while achievement standards indicate how much academic knowledge a student demonstrates on an assessment.)

Panels determined the lowest grade where a student who achieves At Target is likely to consistently demonstrate the academic skills identified by the first panel. According to the DLM theory of action, the range of postsecondary options students might pursue, and the goal of balancing rigor and access (see Chapter 1), we formed two hypotheses:

1. Nearly all academic skills will be associated with PLDs at a variety of grades between grade 3 and high school. Few if any academic skills will first occur before grade 3 At Target or after high school At Target.
2. Because academic skills may be associated with multiple opportunities and with soft skills needed for employment and education, we expected Hypothesis 1 to hold for academic skills associated with employment opportunities, education opportunities, and soft skills.

By identifying the lowest grade where a student achieving At Target is likely to consistently demonstrate the academic skill, panels identified the first point where students would be ready to pursue postsecondary opportunities that required the least complex application of the skill. Given the vertical alignment of DLM content and achievement standards, students are expected to continue their learning in subsequent grades and be ready for more-complex applications of the academic skills by the time they transition into postsecondary education and employment.

This chapter describes the three virtual subject-specific meetings, where panels of educators used their professional subject-matter knowledge and knowledge of the student population to rate the academic skills identified in Chapter 4 (see Final Academic Skills) against the DLM alternate academic achievement standards.

Methods

We conducted virtual panel meetings for each subject (i.e., ELA, mathematics, science). Each single-day, subject-specific panel included preevent training and self-evaluation, panel-day training, ratings and discussion of academic skills with alternate achievement standards, and a panel-evaluation questionnaire. When time permitted, we also conducted a brief, post-rating panel focus group.

Participants

We provided a recruitment brochure to DLM state partners to recruit potential panelists within their states (see Appendix 5.A). States were asked to recruit educators who ideally had expertise across more than one grade band, specifically general educators who had some familiarity with DLM alternate assessments and special educators who taught students who take DLM assessments and who had strong knowledge of at least one academic subject. Other priorities in recruitment and selection included (a) individuals' ability to meet the obligations required for a virtual panel meeting (described in Appendix 5.A), (b) forming panels with equal representation of content and special education expertise, (c) variety and years of experience within panels, and (d) variety in state representation within panels.

Potential participants were asked to fill out a preliminary questionnaire that asked their title, grade band(s) taught, primary area of subject expertise, and years of experience. It also asked special education teachers if they had provided transition planning for any students who take the DLM assessments and their licensure. The recruitment yielded 55 applicants for the ELA panel and 19 each for mathematics and science. From these applicants, we chose 10 from each subject area whose background and experience met the panel needs, with attention given to ensure coverage across grade bands and equal representation from general education and special education. Of those selected, eight people provided consent and completed the mandatory preevent training for the ELA panel, seven did so for the mathematics panel, and eight did so for the science panel. To ensure adequate grade-band coverage, we invited another science panel member, for a total of nine participants. Table 5.1 shows the distribution across states of all panelists and panelist characteristics. Panelists represented nine states, with one to three per state except Missouri and Arkansas. Roughly equal numbers had general education, special education, or dual licensure.

Table 5.1
Panelist Characteristics (N = 24)

Characteristic	<i>n</i>
State	
Arkansas	5
Delaware	1
Illinois	1
Iowa	3
Maryland	1
Missouri	7
New Jersey	2
West Virginia	2
Wisconsin	2
Gender	
Male	4
Female	20
Title	
Special education teacher	8
Dual licensed teacher	7
General education teacher	6
Other	3
Highest degree earned	
Bachelor's	3
Master's	9
Master's plus	12
Years of experience	
1–5	1
6–10	6
11–15	3
16–20	6
21+	8
Experience with transition planning	7

Table 5.2 shows the number of panelists for each subject with primary expertise in each grade band. Across all subjects, several panelists indicated expertise in more than one grade band.

Table 5.2
Number of Panelists per Subject and Grade Band (N = 24)

Panel	Primary expertise (n)	Other expertise (n)
ELA		
Elementary	1	4
Middle school	1	6
High school	6	0
Total	8	
Mathematics		
Elementary	1	2
Middle school	3	3
High school	3	1
Total	7	
Science		
Elementary	2	1
Middle school	3	3
High school	4	1
Total	9	

Panel Facilitators

The primary panel facilitator was staff member in Accessible Teaching, Learning, and Assessment Systems (ATLAS) with more than 20 years of experience facilitating focus groups and panel-type studies (e.g., alignment, standard setting) and 20 years of experience in alternate assessment. The secondary facilitator was an ATLAS staff member with over 15 years of experience in special education, with five years of experience in alternate assessment, expertise in secondary transition, and five years of experience teaching students with significant cognitive disabilities (SCD). A third ATLAS staff member with expertise supporting meetings and special events provided technical support and managed the online meeting software, materials, and recording.

Panel Activities

To be eligible for the panel event, panelists were required to complete advance training. More training was provided the day of the panel ratings, followed by ratings and discussion of academic skills and a panel-evaluation questionnaire. When all rating activities were complete, we conducted a brief focus group when time permitted.

Training

The purpose of advance training was to ensure all panelists, regardless of prior experience with DLM assessments, had the equivalent background information they needed about the DLM assessment system and the student population to prepare them to learn about the panel procedures.

All advance training activities were provided in a Moodle course, consisting of seven videos describing

1. students with SCD
2. postsecondary opportunities for students who take DLM assessments
3. DLM EEs
4. what DLM assessments measure
5. how skill mastery is defined for DLM assessments
6. information contained in a score report
7. DLM PLDs

After watching the videos, panelists completed a self-evaluation that allowed them to judge their level of understanding of the material and ask questions before their panel. Most panelists (92% to 96% per topic, across panels) rated their understanding of topics as excellent or good for each topic. Two questions asked on the survey were addressed during the virtual meetings. The remaining six questions pertained to topics not relevant to the ratings panel (e.g., more information about documentation for DLM eligibility criteria) and were answered via follow-up emails.

Additional panelist training took place at the beginning of the virtual panel meeting. This training began with a review of less-familiar concepts that panelists had identified in the advance training self-evaluation survey. The purpose of panel-day training was to prepare panelists for their responsibilities during the virtual panel meeting. Topics covered during on-site training included

- the purpose of the panel event
- a refresher on DLM PLDs
- participant and facilitator roles and responsibilities
- an overview of postsecondary opportunities, responsibilities, and how we developed the academic skill statements
- an overview of the rating procedures
- a review of the key resources

Training presentations varied slightly by subject. See Appendix 5.B for a copy of the ELA panel slide deck.

Materials

Before the panel meeting, panelists were given hard copies of materials needed for use during the ratings (e.g., rating guide, PLDs). Other materials (e.g., discussion guidelines) were provided electronically. A description of these materials follows.

Performance Level Descriptors

DLM PLDs provide an overview of the KSUs students demonstrate at specific performance levels on DLM assessments. PLDs for each grade and subject are posted on the DLM website at <https://dynamiclearningmaps.org/about/assessment-results>. For this study, we created a condensed version of the documents that included only the At Target PLDs for grades 3 through 11/12 for ELA, grades 3 through 11 for mathematics, and grades 3 through 8 for high school science and biology (i.e., science). Raters used the condensed PLD document when rating each academic skill statement. The At Target PLDs for ELA, mathematics, and science are provided in Appendix 5.C.

Rating Guide

Panelists received a copy of the rating guide with the specific codes and definitions they would use when making their ratings. The rating guide, shown in Figure 5.1, provides the panelists' guiding question: "Using your professional judgment, what is the lowest grade in which a student who achieves At Target on the DLM alternate assessment is **80% or more likely** to be able to demonstrate this skill?"

Figure 5.1
ELA Rating Guide

Ratings of Academic Skills with Alternate Achievement Standards	
Rating Guide	
Guiding Question: Using your <u>professional judgment</u> , what is the lowest grade in which a student who achieves At Target on the DLM alternate assessment is 80% or more likely to be able to demonstrate this skill?	
Rating	Definition
0	A student is at least 80% likely to be able to demonstrate the skill <u>before</u> achieving At Target in 3rd grade
3-11	A student is at least 80% likely to be able to demonstrate the skill if they achieve At Target in ____ grade
13	A student is unlikely to be able to demonstrate the skill until after achieving At Target in <i>n</i> th grade
99	Academic skill statement is not specific or clear enough to support any rating (even after reviewing opportunity list)
DO think about:	DO NOT think about:
<ul style="list-style-type: none">How the skill could be used for a range of postsecondary opportunities	<ul style="list-style-type: none">Whether students you personally know could demonstrate the skillHow much support a student might need to show that skill in the workplace or an educational settingHow well the skill aligns to language in the PLD
Remember:	
<ul style="list-style-type: none">If needed, you can ask, via chat, for example opportunities where the skill would be used. <i>Always ask for example opportunities before assigning a value of 99.</i>If the skill falls outside the content described in the PLDs (e.g., a speaking or listening skill, where PLDs focus on reading and writing), pick the best grade based on your professional judgment, relying on your knowledge of the skills included in the PLDs and how those relate to the skill not included.	

Rating Sheet

Individual web-based rating sheets were created for each panelist. Panelists were emailed a link to their ratings sheet the morning of the panel. The sheet contained a list of the academic skills they would be rating and a column for their rating and comments they could refer to during discussion. The sheet settings did not allow them to edit or reorder the academic skills and only allowed the codes from the ratings guide to be entered as ratings. Each sheet linked back to a

master ratings sheet that only the facilitators could access. The master ratings sheet was populated with the panelists' ratings (i.e., P₁ through P_n) and had columns for the final rating and rationale. Figure 5.2 provides a snapshot of the master ratings sheet for ELA. The rating sheets contained all academic skills for each subject.

Figure 5.2
Master Ratings Sheet for ELA Ratings Panel

A	B	C	D	E	F	G	H	I	J	K
Academic Skill	P1	P2	P3	P4	P5	P6	P7	P8	Final Rating	Rationale
Ability to determine what information is missing or what doesn't belong										
Accurately copy information										
Accurately decode letters and numbers >>now accurately identify										
Accurately decode time on clock										
Accurately record information										
Accurately record information in a chart										
Accurately use standard English mechanics and grammar										
Classify items by common attributes										
Compare information presented from different sources										
Compare information presented in different formats										

Virtual Meeting Checklist

The virtual meeting checklist (see Appendix 5.D) provided reminders about the required technology and private meeting-space requirements for the virtual panel meeting.

Guidelines for Productive Virtual Group Discussions

Given the need for discussion of ratings, combined with the virtual nature of the panel meetings, the guidelines for group discussion (see Appendix 5.E) provided panelists with specific guidelines to orient them to the expectations for how to interact in the virtual panel.

Opportunities List (Facilitators Only)

Facilitators had an electronic copy of the list of opportunities, responsibilities, and KSUs associated with the academic skill statements (see example in Chapter 4, Table 4.4). Panelists did not have this list but were able to ask facilitators for examples from the list before deciding a skill was not ratable, as described in the rating procedures below.

Ratings of Academic Skills With Alternate Achievement Standards

This section details procedures for calibration, general rating procedures, and discussion after independent ratings.

Calibration

The purpose of calibration activities was to ensure panelists understood the ratings process and were able to apply any decision rules when making their independent ratings. Calibration activities also allowed all panelists to explain their ratings and hear others' explanations, which allowed them to adjust their own rules and understandings before providing their independent ratings. Discussion continued until the panel reached consensus on a final rating. Consensus was defined as general agreement by a majority of panelists and, if there was still dissent, the panelist with a non-majority viewpoint was comfortable with the majority viewpoint and could accept it as the final rating.

Panelists independently reviewed the At Target PLDs across all grades and then discussed with the group what distinguished the At Target KSUs across grade levels. This discussion oriented

panelists to the skill progressions in the PLDs before they began to rate the academic skill statements. Next, the facilitator led the panel through one independent rating and group discussion of the first skill in the rating sheet. During this process, panelists independently rated the skill on their rating sheet and described the rationale for their rating. The lead facilitator sought explanations for different opinions and listened for signs that panelists were using the guiding question as expected. When necessary, the facilitator reoriented them to the guiding question. The facilitator then recorded the final consensus rating for the skill.

After discussion of the first skill led to consensus, the panelists rated the next five skills independently. Led by the facilitator, they repeated steps 2 and 3. After discussion of the five skills concluded, the panelists indicated via Zoom-meeting voting tools or text chat whether they were comfortable moving on with independent ratings. All panelists indicated readiness to rate after the first five skills.

General Rating Procedures

Panelists determined the lowest grade at which they believed a student achieving At Target is at least 80% likely to be able to demonstrate each skill. Panelists began by evaluating each academic skill statement against the At Target level in grade 3 and worked their way up the grades until they reached the grade-level PLD that best matched the skill statement. When skills were not directly stated in the PLDs, panelists were instructed to use their professional judgment to determine if a skill was something a student would typically be able to demonstrate if they could demonstrate most of the other skills in the PLD. For skills that were not represented in the grade-level PLDs, panelists were given three additional rating options: (a) the skill falls below the range of the At Target PLDs (code = 0), (b) the skill falls above the range of the At Target PLDs (code = 13), and (c) the skill is not specific or clear enough to be rated (code = 99).

Panelists were instructed to use their professional judgment and keep in mind that the skills could be used to pursue a variety of postsecondary opportunities. They were cautioned against thinking about whether students they knew personally could demonstrate a skill, how much support a student may need to perform a specific skill in an employment or educational setting, or how well the skill aligned to the PLDs. Panelists used the At Target PLDs to rate each statement. Before determining that a skill was not ratable, they were instructed to ask the facilitator via text chat for examples of opportunities associated with the skill. Only when a panelist believed the skill was not specific or clear enough, even with example opportunities, would they code the skill as not ratable. After each panel completed independent ratings, facilitators checked for agreement and flagged skills that required discussion because at least half the panelists could not agree.

Each ELA and mathematics panelist rated all academic skills. However, because of time constraints and panel size during the science panel, the 46 skills remaining after calibration were assigned across the nine panelists so that each panelist rated 26 to 28 skills, and each skill was rated by five or six panelists.

Discussion After Independent Ratings

Facilitators identified skills for further discussion when there was not clear agreement across at least half the panelists who rated the skill. The lead facilitator led discussions of 18 (41%) ELA skills, 16 (46%) mathematics skills, and 24 (52%) science skills. Discussions centered on panelists' interpretation of the skills and the rationales for their ratings. The final rating was determined by consensus.

Through the discussions, there were cases when the panels were occasionally split into two subgroups with different consensus ratings because of different interpretations of the skill statements. To reach consensus, the panel divided those skills into two separate skill statements with different ratings. In these cases, the additional skill was typically at a different level of complexity or added clarifying language to accurately identify the skill that was being rated. For example, “Identify data types for a variety of data displays,” was split from “Identify data type in a picture or bar graph” and rated at a higher level (i.e., 8) than the initial skill (i.e., 3). Panelists also felt the need to modify some academic skills to provide a more specific level of detail to come to consensus on a rating. Sometimes, this was in conjunction with an added split skill to distinguish between two complexity levels (e.g., adding and subtracting numbers with and without regrouping). ELA panelists modified two skills and split one skill, mathematics panelists modified three skills and split six skills, and science panelists modified four skills and split one skill. Table 5.3 displays the type of change, initial skill, and the final skill statements after the panel modified or split them.

Table 5.3
Examples of Academic Skill Statements Modified or Split, or Both, During Discussions

Type of change	Initial skill	Final skill(s)
Modified	Accurately decode letters and numbers.	Accurately identify letters and numbers.
Split	Identify and use the appropriate chemical or cleaning solution or tool to accomplish a cleaning task safely.	Identify and use the appropriate chemical or cleaning solution or tool to accomplish a cleaning task safely.
		Identify and use the appropriate tool to accomplish a cleaning task safely.
Modified and split	Estimate size of an object using known referents (e.g., length, area, volume, mass/weight, etc.).	Estimate size of an object using known referents (e.g., length, area, volume, mass/weight, etc.; nonstandard measurements).
		Estimate size of an object using known referents (e.g., length, area, volume, mass/weight, etc.; standard measurements).

Data Preparation and Analysis

Before data analysis, the skills that were added and modified for each panel were updated across each subject’s opportunities list. A staff member familiar with the panel-rating process checked these changes for accuracy and completeness before the data were analyzed. Additionally, each master rating sheet (i.e., for ELA, mathematics, science) was matched with each subject’s opportunity data file using the academic skill statement as the match key. Academic skill statements often occurred more than once across opportunities. Duplicate skill statements were removed within opportunities; that is, if an academic skill statement occurred

more than once across the responsibilities identified for a given opportunity, it was counted only once for the opportunity.

For each subject, the frequency distribution of academic skills was calculated across all rating categories (0–13, 99; see Table 5.3) and reported as percentages. Frequency distributions were also disaggregated by education and employment opportunities, and by the broad skill categories identified in Chapter 4 (e.g., critical thinking, social skills).

Focus Groups

After the ELA and mathematics panels² completed their ratings, panelists participated in a brief focus group to gather high-level impressions of academic skills and postsecondary opportunities for students who take DLM assessments. The focus groups provided a check on the social validity (i.e., relevance and significance) of the study’s topic. The meeting facilitator led each focus group using a semistructured approach. Focus-group questions were supplemented with additional probes where applicable.

Focus-group questions included:

1. Think about the academic statements you rated. To what extent do you think those are important skills for people to use in postsecondary education and employment settings? [not limited to students with significant cognitive disabilities]
2. Before we started the ratings, you heard about some postsecondary opportunities and learned about students with significant cognitive disabilities. In your opinion, to what extent did those opportunities reflect high expectations for students with significant cognitive disabilities?
3. Thinking about the goal of this study and the ratings your panel made, in general do you think students who achieve At Target or above are on track to pursue postsecondary opportunities, including competitive integrated employment, with supports as needed? Why or why not?

Focus-group transcripts were reviewed together to identify common themes. Themes were then summarized across questions.

Results

Panel Ratings

Fifty of 51 (98%) ELA skills, all 46 math skills, and 52 of 53 (98%) science skills were ratable. The ELA panel felt that “Read aloud with accuracy and understanding” raised concerns about students who do not communicate verbally. The panel decided not to rate this statement after noting that removing the word “aloud” made it equivalent to another academic skill they already rated. The science panel determined that “Use knowledge of simple machines (e.g., wheel and axle) to determine the solution for when a device isn’t working” could not be rated because it did not fit into the skills measured in the PLDs. See Appendix 5.F for a sampling of academic skills and their final ratings.

In this section we report the distribution of ratings across grades by subject, ratings disaggregated according the skills’ association to employment or education opportunities, and ratings for academic skills associated with soft skills.

² The science panel did not have time to complete the focus group.

Distribution Across Grades

Figure 5.3 displays the distribution of final ratings for all ratable ELA skills. Most ELA academic skills were rated as below grade 3 ($n = 12$; 24.0%) or at grade 3 ($n = 19$; 38.0%). In other words, the panel decided that more than half of the skills would be commonly demonstrated by students achieving At Target at or before grade 3. When making their ratings, panelists sometimes defined terms in the skills differently, leading to discussion of how they conceptualized the skill before coming to consensus. For example, “Accurately record information in a chart” resulted in much discussion about the complexity of what a chart may look like. After hearing details of the opportunity (stock clerk), the panelists agreed that the rating should be grade 4. Similarly, when deciding on the rating for “Accurately use standard English mechanics and grammar,” panelists spent time analyzing where the expectation of accurate use of mechanics and grammar occurs before deciding on grade 9.

Figure 5.3
Distribution of ELA Skills Across the Lowest Grades in Which a Student At Target Is Likely to Demonstrate the Skill

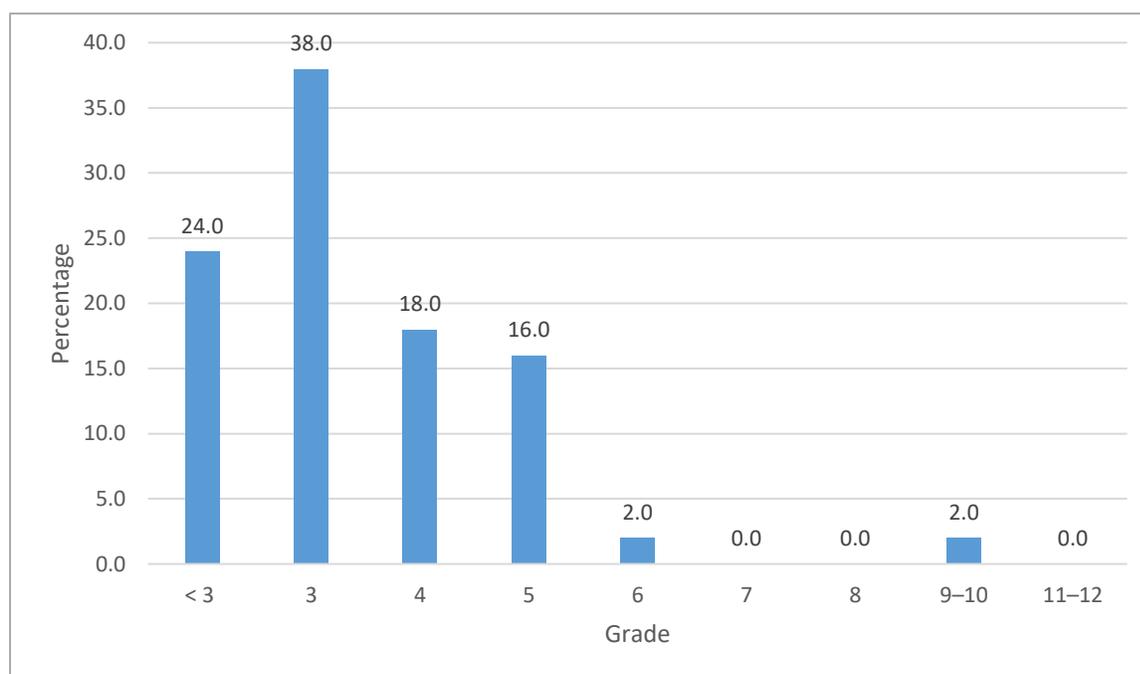


Figure 5.4 shows the distribution of ratings of mathematics skills. More than half the mathematics skills were rated at grade 4 ($n = 9$; 19.6%) or grade 5 ($n = 15$; 32.6%), and only 4% were associated with high school PLDs. Panelists had difficulty with the four skills that involved estimation because estimation is not emphasized on the DLM blueprint (and therefore not mentioned in the PLDs). Panelists had varying experiences and opinions on where a student would be able to demonstrate the skill. Some panelists viewed estimation as a more difficult skill requiring higher-level mathematics to accomplish, but others described interpretations in which estimation was a simpler skill. After discussion, the four skills involving estimation resulted in ratings ranging from grade 3 to grade 6.

Figure 5.4
Distribution of Mathematics Skills Across the Lowest Grades in Which a Student At Target Is Likely to Demonstrate the Skill

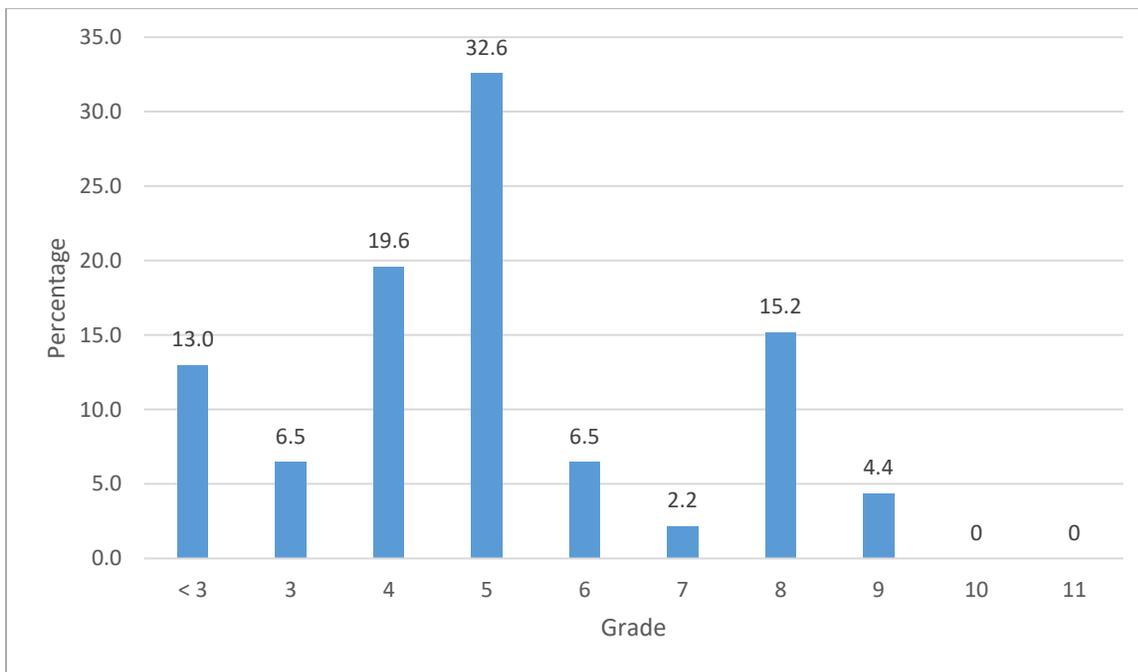
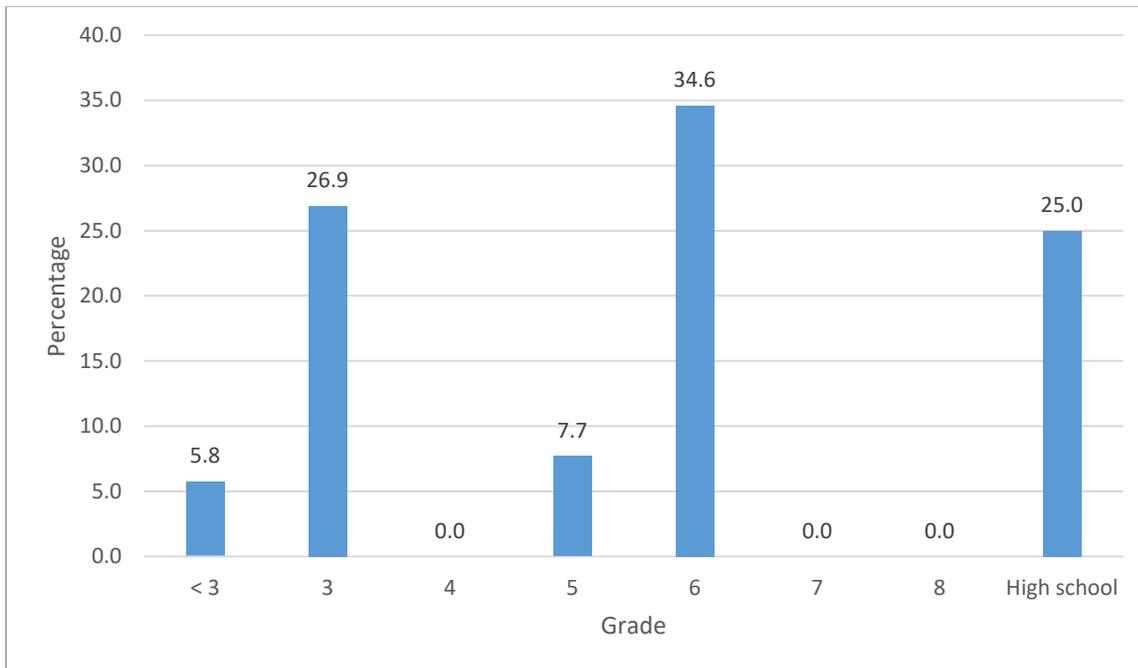


Figure 5.5 displays the distribution of final ratings for all ratable science skills. Ratings were distributed across grades ranging from below grade 3 to high school, with 26.9% ($n = 14$) rated at grade 3, 34.6% ($n = 18$) at grade 6, and 25.0% ($n = 13$) at high school. Within high school, two skills (3.8%) were associated with the biology PLDs, nine (17.3%) with general science, and two (3.8%) with both biology and high school science. Through discussion, panelists were able to refocus and make sure their ratings were based on the language in the PLDs. When discussing “Determine when an animal health concern needs to be referred to an animal health professional,” panelists varied in their initial conceptualization of the skill and the lowest grade at which a student would be able to demonstrate the skill. Some panelists felt that the ability to refer to an animal health professional was a higher-level skill. After discussion, they reached consensus and determined the least complex version of this skill occurs in both high school science and biology.

Figure 5.5

Distribution of Science Skills Across the Lowest Grades in Which a Student At Target Is Likely to Demonstrate the Skill



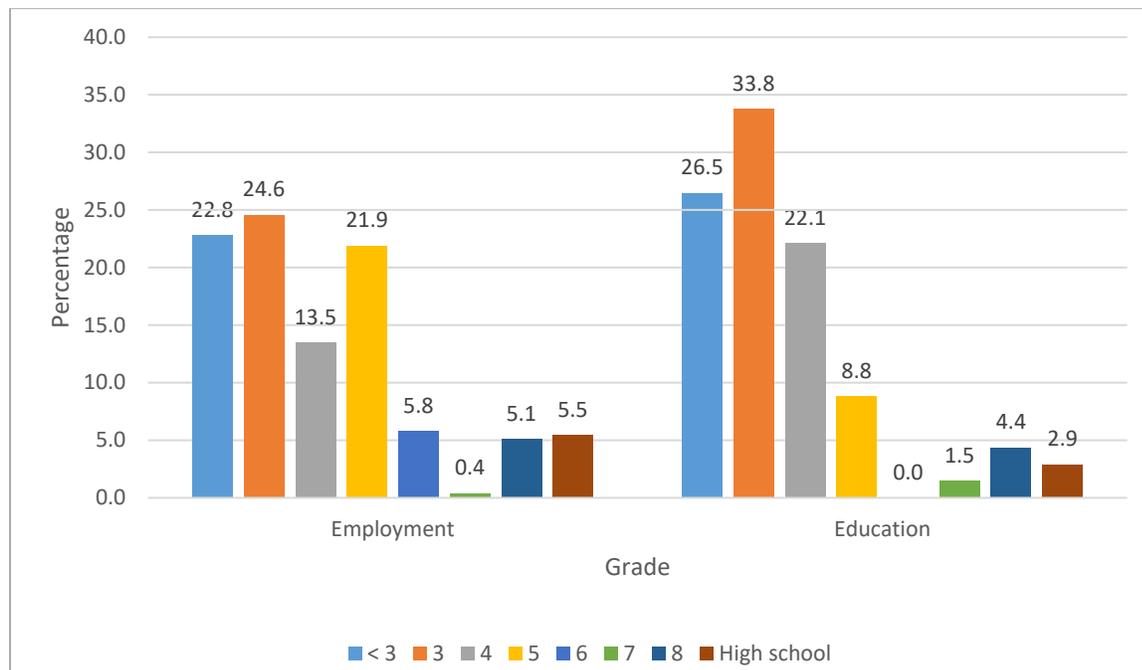
Note: High school science and biology are reflected in the high school ratings.

Skills for Employment and Education

As described in Chapter 4, some academic skills are applicable across both employment and education settings, while others may be unique to one of those settings. We explored the distributions of the ratings of academic skills across all subjects by employment ($n = 546$) and education ($n = 68$) categories (see Figure 5.6). Both distributions showed a slight positive skew, indicating most of the ratings were concentrated at the lower grades. Nearly 83% of the academic skills were rated from below grade 3 through grade 5 across employment opportunities, whereas over 91% were rated from below grade 3 through grade 5 across education opportunities. This suggests that most skills needed to access postsecondary outcomes are introduced early in students' academic careers, and students build on these skills as they progress through school. Only about 5% of the employment skills and almost 3% of education skills were determined to be skills that are not demonstrated until high school by students who are At Target. No skills were rated as occurring for the first time beyond the highest high school PLD.

Figure 5.6

Distribution of Academic Skills Across the Lowest Grades in Which a Student At Target Is Likely to Demonstrate the Skill, by Employment and Education Opportunities



Note: High school includes general high school science and biology.

Soft Skills

Soft skills, such as critical thinking and social skills (see Chapter 4), require academic skills that are applicable across both employment and education opportunities. Panels determined that most of the 23 academic skills associated with five soft skills ($n = 18$; 78%) would be demonstrated by students who performed At Target at or before grade 5 (see Table 5.4).

Table 5.4

Distribution of Ratings of Academic Skills Associated With Soft Skills (N = 23)

Grade	<i>n</i>	%
Below 3	5	21.7
3	3	13.0
4	3	13.0
5	7	30.4
6	0	0.0
7	1	4.3
8	3	13.0
9–10	1	4.3
High school science / biology	0	0.0

Evaluation Survey

At the conclusion of each panel, 20 of 24 panelists (83%) completed a postpanel evaluation survey. Panelists responded to the questions using a 4-point Likert scale, choosing from strongly disagree, disagree, agree, or strongly agree. Table 5.5 shows that most panelists agreed or strongly agreed that the meeting was well organized, they were prepared to complete their ratings, and they used the PLDs when making their ratings. Furthermore, panelists felt the meeting produced realistic evaluations of the academic skills, group discussions were open and honest, and the meeting was valued as a positive professional development experience. Individual comments were also overwhelmingly positive, with panelists appreciating the effective use of technology to hold the event, the professional discussions, and the information learned about DLM assessments.

Table 5.5
Panelist Evaluation Survey Results (N = 20)

Item	Strongly Disagree	Disagree	Agree	Strongly agree	Agree + Strongly agree (%)
The overall goals of the ratings panel meeting were clear.	1	0	3	16	95
The meeting was well organized.	1	0	2	17	95
The advance and meeting-day training prepared me to complete my activities.	1	1	7	11	90
I used the performance level descriptors when I evaluated each academic skill.	1	0	5	14	95
I considered the other panelists' opinions when discussing academic skill ratings as a group.	0	0	4	16	100
I used my professional judgment about the content and student population when I evaluated each academic skill.	0	0	11	9	100
I am confident that the meeting produced realistic evaluations of the academic skills.	0	0	7	13	100
Overall, I believe my opinions were considered and valued by the group.	0	0	6	14	100
Overall, my group's discussions were open and honest.	0	0	4	16	100
The facilitator was effective at guiding our panel through the ratings process.	0	0	4	16	100
Participating in the process increased my understanding of the DLM assessment system.	0	0	5	15	100
Overall, I valued the panel meeting as a professional development experience.	0	0	2	18	100

Focus Groups

Overall, panelists indicated the skills they rated represented important skills students need to be a productive member of society. Special education teachers generally believed that the rating process helped them see the link between what they were doing in the classroom and skills students may need to access postsecondary employment or education. One special educator said that she saw that some of her students could progress to have some of the employment opportunities listed. The ratings process gave some teachers new insights into how the PLDs could be used to talk to parents about skills students need to develop.

Panelists agreed that the range of opportunities described reflected high expectations, and some expressed concern about how many students may actually achieve those expectations. Panelists also recognized that gaining knowledge about skills needed in postsecondary settings will assist them in helping students achieve higher expectations. Some panelists expressed concern about the lack of community resources to help students after they leave high school; although students may be prepared to pursue opportunities, panelists acknowledged the need for additional supports for them to do so successfully. Many panelists recognized that schools and communities need a change in perspective to see that students can take advantage of postsecondary opportunities when they are provided with proper supports.

When asked whether students who were At Target were generally on track to pursue postsecondary opportunities, panelists hesitated to agree without adding some caveats. For instance, one panelist pointed out that not all general education students were motivated to pursue postsecondary education opportunities, so the same could be expected of students with SCD. Panelists referred to some nonacademic indicators, such as negative behavior, that may influence students' postsecondary options. In general, panelists felt that with supports and without interfering behaviors, At Target students were on track to pursue postsecondary opportunities.

The focus-group results provide evidence supporting the need for high expectations for students with SCD. The rated skills were important to postsecondary education and employment opportunities for all students, not only those with SCD. Though the panels acknowledged many students should also be able to demonstrate nonacademic skills, they felt students who were At Target in high school on the DLM alternate assessment possessed the necessary academic knowledge, skills, and opportunities to pursue a range of postsecondary opportunities.

Summary

This chapter describes three virtual panel events in which academic skills were rated against the alternate academic achievement standards for ELA, mathematics, and science. General and special educators with subject area expertise independently rated and then participated in discussions to reach consensus on the lowest grade level in which students who were At Target could demonstrate those skills. Panels modified some academic skill statements and added others when they felt it was needed to rate the skill and gain consensus. Results include distributions of ratings by subject and by opportunity type. Overall, students achieving At Target in lower grade levels demonstrate the least complex application of the ELA and mathematics academic skills. Ninety-four percent of ELA skills and 72% of mathematics skills were rated at grade 5 or below. More science skills were rated likely to be demonstrated by students achieving At Target in grade 6 or high school than were ELA or mathematics skills, though 40% of science skills were rated at grade 5 or below. Most academic skills are expected of students

achieving At Target by grade 5 across both education and employment opportunities. In other words, the least complex version of many skills needed in postsecondary employment and education opportunities are associated with meeting achievement standards (i.e., At Target) before high school.

Chapter 6 describes the implications of these results as they pertain to Critical Element 6.3: *“The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.”*

6. Conclusion

This report describes evidence of the extent to which Dynamic Learning Maps® (DLM®) alternate academic achievement standards are aligned to ensure that a student with significant cognitive disabilities (SCD) who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment. Findings support our hypotheses that:

1. Nearly all academic skills will be associated with performance level descriptors (PLDs) at a variety of grades between grade 3 and high school. Few if any academic skills will first occur before grade 3 At Target or after high school At Target.
2. Because academic skills may be associated with multiple opportunities and with soft skills needed for employment and education, we expected Hypothesis 1 to hold for academic skills associated with employment opportunities, education opportunities, and soft skills.

Students who achieve At Target on the DLM alternate assessments possess a range of academic knowledge, skills, and understandings (KSUs) that are necessary to pursue a variety of postsecondary education and employment opportunities.

This study is grounded in a view of postsecondary opportunities consistent with the Individuals with Disabilities Education Act (IDEA) goal that children with disabilities receive an education that prepares them for “further education, employment, and independent living” (IDEA, 34 C.F.R. §300.1) and the Workforce Innovation and Opportunity Act requirement that individuals with the most significant cognitive disabilities have opportunities to pursue competitive integrated employment. The first panel identified a wide range of opportunities across postsecondary education and several employment sectors. All of the identified employment opportunities can meet the definition of “competitive integrated employment” when the right employer conditions and individualized supports are in place. Panelists identified opportunities that historically may not have been pursued by most students with SCD because the opportunities were inaccessible or because students did not leave high school with the necessary skills. The panel also identified academic skills embedded within soft skills, which are important for a range purposes including citizenship and community integration.

Although the study is based on a sampling of postsecondary opportunities that reflect high expectations for what students with SCD may pursue in the future, it also accounted for the fact that individuals with SCD need a range of options to access those opportunities. As those access points vary, so does the complexity of the academic skills needed to pursue the opportunities. We asked panelists to identify the lowest grade in which a student who meets the achievement standard was likely to have the skill, in order to ensure students would be able to access to opportunities requiring the least complex version of the skill. In all three subjects (ELA, mathematics, science), students who meet achievement standards in elementary grades are likely to have some of the academic skills needed to pursue postsecondary opportunities. Fewer academic skills were first associated with At Target achievement in middle and high school grades.

According to the evidence of vertical alignment of the Essential Elements and the alternate achievement standards, students who achieve At Target in a lower grade are expected to continue learning and make progress toward more-complex applications of the academic skills. For example, panelists rated “add and subtract multi-digit numbers without regrouping” as one

that a student who achieved At Target in grade 4 would be able to demonstrate. That skill provides access to an opportunity to work as a stock clerk. But the student who learns to apply that skill in more-complex ways will have access to other employment opportunities (see Table 6.1).

Table 6.1
Progression of a Mathematics Skill and its Application in Postsecondary Opportunities

Grade	Skill	Use in postsecondary opportunities
4	Add and subtract multidigit numbers without regrouping.	Check inventory, stock items.
7	Apply the properties of addition or multiplication to solve problems.	Calculate perimeter of garden to determine how much fence is needed.
10	Represent and solve real-world problems.	Determine profit on sold merchandise and calculate how much more inventory can be ordered.

Note: The grade 4 skill was rated by panelists. Grade 7 and 10 skills are represented in the performance level descriptors.

Students who achieve At Target in high school are academically prepared to pursue postsecondary education or competitive integrated employment that requires more-complex demonstrations of academic skills. Even if a student achieves At Target in lower grades but reaches only Approaching the Target by high school, that student would still have built on their earlier mastery of a variety of academic skills necessary to pursue postsecondary opportunities. For example, consider a student who achieved At Target in grade 5 mathematics and by high school was interested in pursuing a postsecondary employment opportunity that requires mathematics skills. By grade 5, the student would have mastered about half of the mathematics skills associated with opportunities identified in this study (see Figure 5.4). That student would be able to continue developing those skills in middle and high school and, upon completing high school, be ready to pursue postsecondary employment in a position that requires those math skills to fulfill the position’s responsibilities. The same premise holds for academic learning across grades for all students, not just those with SCD.

Strengths and Limitations

Until the 2018 revision to U.S. Department of Education peer review Critical Element 6.3, there was no historic precedent for evaluating whether alternate academic achievement standards support student readiness to pursue postsecondary opportunities. This study borrowed from well-established methodologies on related topics (e.g., alignment, standard setting) where possible and was designed to be consistent with the goals and assumptions in the Dynamic Learning Maps Consortium’s theory of action. New methods (e.g., panel rating of academic skills) were piloted and refined before panel meetings. Procedural evidence (e.g., panel evaluations) was collected through both panel studies. A member of the DLM Technical Advisory Committee (TAC) externally reviewed materials, trainings, meeting recordings, and results of the academic skills ratings process and provided feedback to the full TAC (see Appendix 6.A). Overall, the TAC member determined that the panel was well-planned and accommodating; panels were implemented with fidelity; and discussion was encouraged and all voices were considered. Finally, the DLM TAC advised on overall study design and reviewed results and interpretations based on the earlier body of vertical alignment evidence and the new

panel studies. The TAC determined that the methodology was sound and the results were likely to be useful to DLM partner states (see Appendix 6.B).

Despite the study's strengths, there are also some limitations. The study is based on a sample of opportunities and responsibilities, not the entire range of what students with SCD may pursue after high school. While the sample was broad, there are likely other academic skills applicable in other settings that were not identified and evaluated in this study. We relied on panelists with deep expertise in postsecondary transition to identify postsecondary opportunities and associated responsibilities. These panelists were less well-versed in the language of academic content standards and PLDs, so the initial descriptions of academic skills were more generic and repetitive than anticipated. We added the step whereby subject-matter experts refined the academic skill statements to ensure the skills were of the right grain size for the second panel to evaluate. In the future, a similar study may benefit from a panel composed of experts in transition, postsecondary education and employment, and academic instruction. Given more time and resources, job-analysis techniques could be used to generate more-complete lists of responsibilities and more context-dependent academic skill statements.

The panel that rated academic skills had a cognitively challenging task. Although the procedural evidence supported the overall trustworthiness of the results, the panels had more difficulty with their ratings in two situations. Consensus discussions were more extensive when panelists perceived a larger gap between when they introduced topics in their own classrooms and when a student who is At Target would be able to demonstrate the skill. There was also more discussion when the academic skill was more distal to the language of the PLD because the topic was not emphasized in DLM assessments (e.g., estimation in mathematics). When panelists were not able to come to agreement after some discussion, they were given examples of opportunities in which the skill might be used. This added context was important for helping them reach consensus.

Implications and Future Studies

This study highlights the importance of academics for students with SCD as they pursue a wider range of postsecondary opportunities, and how DLM assessment results can provide evidence that students who meet achievement standards are on track to pursue those opportunities. State partners can use these results to target technical assistance to districts and emphasize partnerships with state and district transition specialists to effectively combine relevant and challenging academic instruction with transition education.

This study was delimited to evaluation of the academic skills needed to access postsecondary opportunities. There are many other factors that affect whether an individual is successful in their pursuits, such as self-determination, family attitudes and supports, and community contexts. While students may leave school ready to pursue postsecondary opportunities and are able to continue learning, employers may lack awareness of what individuals with SCD can do. Professionals who work with students with SCD (e.g., transition specialists, vocational rehabilitation staff) can play an important role in educating employers so they provide more opportunities. Revising high school curricula to better integrate academics with transition could also help bridge the gap between student readiness and postsecondary employer/educator readiness to provide opportunities. To gain a more complete view of how students' academic KSUs and nonacademic experiences in high school support access to postsecondary opportunities, researchers could track students through high school and into their postsecondary pursuits.

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Aligned Academic Achievement Standards to Support Pursuit of Postsecondary Opportunities: *Instructionally Embedded Model – Appendices*

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DLM[®] Performance Level Descriptors—ELA: Grade 3

Instructionally Embedded Model

<p>Emerging</p>	<p>A student who achieves at the emerging performance level typically can attend to and seek objects, identify feeling words, and identify sequences when reading literature and informational text.</p> <p>The student attends to and seeks objects associated with a text by</p> <ul style="list-style-type: none"> • attending to object characteristics when verbally cued • seeking objects that are absent or are of interest to the student <p>The student identifies feeling words by</p> <ul style="list-style-type: none"> • identifying personal feelings <p>The student identifies sequences by</p> <ul style="list-style-type: none"> • noticing new objects • identifying forward sequences from familiar routines <p>When writing, the student</p> <ul style="list-style-type: none"> • attends to objects, people, or pictures • makes a choice between two objects
<p>Approaching</p>	<p>A student who achieves at the approaching the target performance level typically can identify details and facts, identify feeling words, and identify text structure when reading literature and informational text.</p> <p>The student identifies details and facts by</p> <ul style="list-style-type: none"> • identifying concrete details • identifying familiar people, objects, places, or routines • recognizing similar and different physical characteristics of objects • answering who or what questions about familiar texts <p>The student identifies feeling words by</p> <ul style="list-style-type: none"> • identifying the feelings of characters when explicitly stated <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • recognizing pictures from familiar texts • recognizing the beginning and end of familiar texts <p>When writing, the student</p> <ul style="list-style-type: none"> • selects a familiar topic • connects two or more words

<p>At Target</p>	<p>A student who achieves at the at target performance level typically can identify details and ideas, demonstrate an understanding of language, identify feelings, and recognize text structure when reading literature and informational text.</p> <p>The student identifies details and ideas by</p> <ul style="list-style-type: none"> • identifying concrete details • answering who or what questions <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • determining words that complete literal sentences in texts <p>The student identifies feelings by</p> <ul style="list-style-type: none"> • identifying personal feelings • identifying character feelings <p>The student recognizes text structure by</p> <ul style="list-style-type: none"> • using basic text features to locate information • recognizing the beginning, middle, and end of familiar texts • identifying common elements in two texts <p>When writing, the student</p> <ul style="list-style-type: none"> • uses facts and details to write about a topic • expresses more than one idea
	<p>A student who achieves at the advanced performance level typically can recognize details, ideas, and supporting points made by the author; demonstrate an understanding of language; identify feelings; and recognize text structure when reading literature and informational text.</p> <p>The student recognizes details, ideas, and supporting points made by the author by</p> <ul style="list-style-type: none"> • answering who, what, when, where, or why questions • associating concrete details with events <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • understanding definitions for unambiguous words in texts <p>The student identifies feelings by</p> <ul style="list-style-type: none"> • relating character feelings to actions <p>The student recognizes text structure by</p> <ul style="list-style-type: none"> • comparing two texts • using text features to locate information • recognizing the beginning and end of an unfamiliar text <p>When writing, the student</p> <ul style="list-style-type: none"> • selects an informational topic • includes information from resources to support the topic • expresses complete thoughts

DLM Performance Level Descriptors—ELA: Grade 4

Integrated Model

Emerging	<p>A student who achieves at the emerging performance level typically can indicate objects and identify familiar people, objects, or places when reading literature and informational text.</p> <p>The student identifies familiar people, objects, or places associated with a text by</p> <ul style="list-style-type: none">• attending longer to a new object that has been added to a pair of familiar, identical objects• indicating a similar object from a group of two similar objects and one different object• indicating a different object from a group of two identical objects and one different object• indicating familiar people, objects, or places <p>When writing, the student</p> <ul style="list-style-type: none">• identifies familiar people, objects, or places• understands object names• understands that letters are used to write words• identifies the first letter of his or her name• recognizes when a letter is uppercase or lowercase
Approaching	<p>A student who achieves at the approaching the target performance level typically can identify objects associated with a text, identify text elements, and demonstrate an understanding of language when reading literature and informational text.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none">• naming objects or pictures associated with familiar texts• indicating objects or pictures from named categories <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying concrete details in a familiar story• identifying character actions• identifying major events in a familiar story <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying words with similar or different meanings• identifying words that describe familiar people, objects, or places from a text <p>When writing, the student</p> <ul style="list-style-type: none">• identifies words that describe familiar people, objects, or places• uses letters to create words• demonstrates an understanding of capitalization

<p>At Target</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • describing characters and their actions • identifying how characters’ actions result in consequences • associating events using details • identifying the narrator of a story • identifying the theme of a familiar story <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • selecting appropriate words to complete literal sentences • determining the meaning of unambiguous words in a text • providing real-world connections between words and their use <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • using pictures or objects related to the text to learn additional information • identifying the main points made in a text • identifying the beginning, middle, and end of a familiar story • determining when two different texts on the same topic make a similar statement <p>When writing, the student</p> <ul style="list-style-type: none"> • identifies words, facts, details, or other information related to a topic • spells words phonetically using letter-sound knowledge and common spelling patterns • capitalizes the first letter of a sentence
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<p>Advanced</p>	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • describing characters, settings, and events • using details to answer questions • identifying reasons that support points made in a text • identifying the overall topic of a text <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • determining which words in a text relate to the topic • identifying the meaning of words with that have multiple meanings • identifying words with opposite or similar meanings <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying elements of a story that change from the beginning to the end • determining if a text provides information about events, gives directions, or provides information on a topic • comparing and contrasting details in texts based on the same topic <p>When writing, the student</p> <ul style="list-style-type: none"> • provides facts, details, or other information related to the topic • spells words with inflectional endings • uses correct capitalization when writing a title
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DLM Performance Level Descriptors—ELA: Grade 5

Integrated Model

<p>Emerging</p>	<p>A student who achieves at the emerging performance level typically can indicate objects and identify familiar people, objects, or places when reading literature and informational text.</p> <p>The student identifies familiar people, objects, or places associated with a text by</p> <ul style="list-style-type: none"> • identifying an object associated with a familiar routine • communicating his or her preference for an object when asked a yes/no question • interacting with an object in an expected way • indicating objects that are the same • indicating common, physical features of objects • identifying familiar people, objects, and places <p>When writing, the student</p> <ul style="list-style-type: none"> • identifies words that describe familiar people, objects, or places • makes a choice between two objects • demonstrates an understanding of who, what, when, where, or why questions
<p>Approaching</p>	<p>A student who achieves at the approaching the target 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.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none"> • indicating objects with a given property <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • identifying character actions • identifying major events • understanding the relationship among concrete facts or details • identifying the setting of a familiar story <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • identifying words that describe familiar people, objects, or places • identifying real-world uses of words • identifying words with similar or different meanings <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying objects or illustrations from familiar texts <p>When writing, the student</p> <ul style="list-style-type: none"> • identifies details related to a personal experience • produces facts and details about a topic



At Target	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying and comparing characters• identifying details• identifying setting• identifying major events• identifying how characters' actions result in consequences• finding similarities between key details• identifying two points made by the author, how they relate to each other, and reasons that support the points• determining the narrator and narrator's point of view• identifying the theme or main idea <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using sentence context to identify a missing word• using context clues to determine meaning• determining the meaning of unambiguous words• identifying similar and opposite meanings• understanding that words have multiple meanings• identifying domain-specific words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying elements of the story that change from beginning to end• determining if a text tells about events, gives directions, or provides information• using text features to locate information• comparing and contrasting details in two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces an informational topic• conveys information about the topic• provides facts or details related to the topic
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Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying key details to contrast characters• identifying specific words that describe what the narrator is thinking• identifying examples that support the points made by the author• identifying the similarities and differences between key details• determining which details contribute to the main idea of a paragraph• identifying details that relate to the theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• organizing words semantically• using text context to identify a missing word• understanding multiple-meaning words• understanding the use of word choice to influence the meaning of a text <p>The student identifies text structure by</p> <ul style="list-style-type: none">• understanding how the title fits the structure of the text• using text features to locate information• comparing and contrasting the main points of two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces an informational topic• includes one or more facts or details related to the topic• conveys both ideas and information
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DLM Performance Level Descriptors—ELA: Grade 6

Integrated Model

Emerging	<p>A student who achieves at the emerging performance level typically can identify familiar people, objects, places, or routines; demonstrate an understanding of language; and identify text structure when reading literature and informational text.</p> <p>The student identifies familiar people, objects, places, or routines associated with a text by</p> <ul style="list-style-type: none">• identifying familiar people, objects, or places• identifying actions in familiar routines <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• understanding action words• using property words to identify familiar objects <p>The student identifies text structure by</p> <ul style="list-style-type: none">• differentiating between text and pictures <p>When writing, the student</p> <ul style="list-style-type: none">• makes a choice between two objects• identifies words that describe familiar people, objects, or things• identifies the first letter of her or his own name• demonstrates an understanding of who, what, when, where, or why questions• identifies details about a personally relevant photograph or object• uses letters to create words
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<p>Approaching the Target</p>	<p>A student who achieves at the approaching the target 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.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none">• identifying similar or different objects• identifying objects within a category <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying characters and their actions• identifying details• identifying setting• identifying major events <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying descriptive words• determining words that complete literal sentences in texts <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying illustrations from familiar texts <p>When writing, the student</p> <ul style="list-style-type: none">• selects a topic• includes one fact about the topic• uses spelling patterns in familiar words to spell new words
	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying character feelings and associated actions• identifying details• identifying events• identifying the narrator <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying words with opposite meanings• identifying real-world uses of words• identifying words with multiple meanings• determining word meaning using context clues <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying linear parts of a story• understanding the purpose of a text's structure <p>When writing, the student</p> <ul style="list-style-type: none">• introduces an informational topic• includes facts and details related to the topic• spells phonetically using letter-sound knowledge and common spelling patterns



Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying the relationship between concrete details• identifying the main idea• identifying details that support the main idea or theme• determining explicit and implicit details• identifying the feelings and thoughts of the narrator• identifying details that defend a claim <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• understanding words with similar or different meanings• understanding the meaning of similes and metaphors• associating word choice with textual meaning <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying text structure• recognizing that titles reflect text structure• comparing two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces a topic and uses clear organization• includes one or more facts or details related to the topic• spells words with inflectional endings
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DLM Performance Level Descriptors—ELA: Grade 7

Integrated Model

Emerging	<p>A student who achieves at the emerging performance level typically can identify familiar people or objects, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies familiar people or objects associated with a text by</p> <ul style="list-style-type: none">• identifying familiar people• understanding the function of objects• anticipating the consequences of a pattern of actions with objects <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying descriptive words• understanding words for absent objects or people <p>The student identifies text structure by</p> <ul style="list-style-type: none">• differentiating between text and pictures• matching a picture representation with a real object <p>When writing, the student</p> <ul style="list-style-type: none">• makes a choice between two objects• identifies words that describe familiar people, places, things, or events• understands that specific members belong to categories• understands that objects have a function• identifies the first letter in his or her name• demonstrates understanding of who, what, when, where, or why questions• identifies functional words to describe common people, places, objects, or events• draws conclusions based on category knowledge• recognizes the first word to read on a page• uses letters to create words
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Approaching the Target

A student who achieves at the **approaching the target** 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

- identifying objects within a category

The student identifies text elements by

- identifying characters and their feelings that are associated with actions
- identifying details
- identifying setting
- identifying major events

The student demonstrates an understanding of language by

- identifying the definition of a word
- recognizing the literal meaning of a word or phrase

The student identifies text structure by

- identifying illustrations from a familiar text
- identifying the beginning and end of a familiar text

When writing, the student

- includes information about a topic
- strengthens the message of written work by adding more information
- recognizes domain-specific words in text
- recognizes end punctuation
- uses spelling patterns in familiar words to spell new words



At Target	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• answering explicit questions• identifying key points made in a text• identifying the main idea• identifying the author’s point of view <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using context to identify the meaning of phrases and multiple-meaning words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• determining the structure of a text• recognizing that titles reflect text structure and purpose• identifying common elements in two texts on the same subject <p>When writing, the student</p> <ul style="list-style-type: none">• introduces an informational topic and conveys ideas and information• provides facts, details, or information related to the topic• selects domain-specific vocabulary• uses end punctuation• spells words phonetically using letter-sound knowledge and common spelling patterns
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Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying a character’s response to a challenge• identifying related points in a text• understanding the relationship among individuals, events, or ideas• identifying the author’s point of view and purpose for writing the text• identifying events related to the theme of a story <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• understanding the meaning of idioms and figures of speech• determining how word choice persuades or informs <p>The student identifies text structure by</p> <ul style="list-style-type: none">• understanding sequencing• understanding how parts of a text affect overall text structure• identifying similarities or differences between two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces a topic and uses clear organization• includes one or more facts or details related to the topic• uses domain-specific vocabulary• uses commas• spells words with inflectional endings
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DLM Performance Level Descriptors—ELA: Grade 8

Integrated Model

Emerging	<p>A student who achieves at the emerging performance level typically can identify familiar people or objects, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies familiar people or objects associated with a text by</p> <ul style="list-style-type: none">• understanding the function of objects• identifying objects associated with a familiar routine or purpose• identifying familiar people <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying descriptive words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying a forward sequence in a familiar routine <p>When writing, the student</p> <ul style="list-style-type: none">• makes a choice between two objects• identifies words that describe familiar people, places, things, or events• uses single words to communicate• identifies when objects belong in a broader category• identifies the end of a familiar routine• understands who, what, when, where, or why questions• identifies perceptual words to describe common people, places, objects, or events• produces a two-word message• draws conclusions based on category knowledge• indicates an ending
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	<p>A student who achieves at the approaching the target 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.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none">• identifying objects within a category <p>The student identifies text elements by</p> <ul style="list-style-type: none">• understanding personal opinions• identifying character actions• identifying details <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying similar or different meanings of words• identifying the literal meaning of words or phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying the beginning, middle, and end of a familiar story <p>When writing, the student</p> <ul style="list-style-type: none">• includes information about a topic• provides facts, details, or other information related to the topic• connects two or more words• selects domain-specific vocabulary• produces a concluding sentence
	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying a character’s response to a challenge• identifying emotional change in characters• identifying the main points of a text• identifying details that support the main ideas• identifying the relationships between details• identifying the author’s point of view and purpose for writing a text• identifying theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using context to identify the meaning of multiple-meaning words• determining the meaning of idioms and figures of speech <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying the structural similarities of two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces an informational topic and conveys ideas and information• includes one or more facts or details related to the topic• expresses a complete thought• uses domain-specific vocabulary• produces a conclusion



Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• associating character actions with their causes• identifying implicit information in a story• identifying events that contribute to the theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• determining the connotative meaning of words and phrases• determining the figurative meaning of words and phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying the structural similarities and differences between two texts <p>When writing, the student</p> <ul style="list-style-type: none">• introduces a topic clearly and uses clear organization• uses facts or details to develop a topic• produces grammatically correct simple sentences• uses domain-specific vocabulary to strengthen claims• produces a relevant conclusion
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DLM Performance Level Descriptors—ELA: Grades 9–10

Integrated Model

Emerging	<p>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.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none">• using property words to identify familiar objects• identifying objects within a category• understanding subgroups of objects within a category <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying details in a familiar text• understanding personal opinions <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying descriptive words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying actions in a familiar routine• identifying the forward sequence in a familiar routine• identifying a sequence of events <p>When writing, the student</p> <ul style="list-style-type: none">• responds to yes/no questions• identifies functional words to describe nouns• produces a two-word message• understands that broad categories contain subgroups• identifies the end of a familiar routine• identifies the first letter of her or his own name• identifies a topic and composes a message with one fact• identifies categorical words to describe nouns• connects two or more words• recognizes domain-specific words• indicates an ending• uses letters to create words
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Approaching the Target

A student who achieves at the **approaching the target** performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.

The student identifies text elements by

- identifying characters' feelings in a familiar story
- identifying details
- answering who or what questions by referring to a text
- identifying the main idea
- identifying an author's points

The student demonstrates an understanding of language by

- determining words or phrases that complete literal sentences in texts
- identifying words when given their definitions
- identifying the meaning of multiple-meaning words

The student identifies text structure by

- identifying the beginning and end of a story
- determining which event comes first in a text

When writing, the student

- introduces and conveys information about a topic
- includes one or more facts or details about a topic
- expresses a complete thought
- uses domain-specific vocabulary
- produces a concluding sentence
- represents an initial sound in a word with a letter



At Target	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• determining internal and external character traits• identifying evidence that supports explicit information in a text• identifying the relationships between details• identifying details related to the theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using context to identify missing words• using context to identify the meaning of multiple-meaning words• determining the meaning of idioms and figures of speech• determining the connotative meaning of words and phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying story elements that change <p>When writing, the student</p> <ul style="list-style-type: none">• introduces and writes about a topic clearly• develops a topic with facts or details• produces grammatically correct simple sentences• uses domain-specific vocabulary to strengthen claims• produces a conclusion• spells single-syllable words conventionally and phonetically
Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying how a character changes or develops• identifying inferred information in a text• identifying the evidence for a claim• identifying events that contribute to the theme• summarizing a familiar informative text <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using semantic clues to identify word meaning• determining the figurative meaning of words and phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying deviations from chronological order <p>When writing, the student</p> <ul style="list-style-type: none">• introduces a topic clearly to convey information• develops a topic by using appropriate information• produces grammatically correct compound sentences• uses academic words in informative writing• produces a relevant conclusion• spells irregular words correctly



DLM Performance Level Descriptors—ELA: Grades 11–12

Integrated Model

Emerging	<p>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.</p> <p>The student identifies objects associated with a text by</p> <ul style="list-style-type: none">• identifying objects within a category <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying concrete details• understanding personal opinions <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• identifying real-world uses of words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying actions in a familiar routine <p>When writing, the student</p> <ul style="list-style-type: none">• demonstrates an understanding of who, what, where, when, or why questions• identifies functional words to describe nouns• produces a two-word message• draws conclusions based on category knowledge• identifies the end of a familiar routine• identifies the first letter in his or her own name• includes facts and details about a topic• identifies categorical words to describe nouns• connects two or more words together• selects domain-specific vocabulary in topical writing• indicates an ending• uses letters to create words
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Approaching the Target	<p>A student who achieves at the approaching the target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying characters• identifying details• identifying setting• identifying major events• using details from a text to answer questions• identifying the theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• understanding similar meanings of words• identifying words when given their definitions <p>The student identifies text structure by</p> <ul style="list-style-type: none">• determining which event comes first <p>When writing, the student</p> <ul style="list-style-type: none">• introduces and conveys information about a topic• identifies quotes that provide relevant topic information• produces grammatically correct simple sentences• uses domain-specific vocabulary• produces a concluding sentence• represents the initial sound in a word with a letter
At Target	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying two related points• identifying details that defend a claim <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• determining the figurative meaning of words and phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying the linear parts of a story <p>When writing, the student</p> <ul style="list-style-type: none">• introduces a topic clearly to convey information• includes quotes from print sources• produces grammatically correct simple, compound, and complex sentences• uses domain-specific vocabulary to strengthen claims• produces a conclusion• spells single-syllable words conventionally and phonetically



Advanced	<p>A student who achieves at the advanced performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none">• identifying how a character changes or develops• identifying events relevant to the theme• summarizing an informational text <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none">• using context to identify missing words <p>The student identifies text structure by</p> <ul style="list-style-type: none">• identifying the order of events in a text• identifying the structure and how it influences meaning <p>When writing, the student</p> <ul style="list-style-type: none">• uses clear organization and presentation to write about a topic• develops a topic by using appropriate information• produces grammatically correct compound-complex sentences• uses academic words in informative writing• produces a relevant conclusion• spells irregular words correctly
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Appendix 1.B: Opportunities and Skills Framework Development and Refinement

Drawing from the existing literature, we developed a framework highlighting predictors of postsecondary education, employment, citizenship, and community involvement for students with significant cognitive disabilities (SCD), with the purpose of showing how academic knowledge, skills, and opportunities (KSUs) support postsecondary opportunities. We did not find examples of academic achievement as predictors of postsecondary access to opportunities; thus we used a position paper by Kearns et al. (2010) to emphasize instruction of general academic skills needed in various postsecondary employment and educational settings, including reading, writing, and mathematics skills. In addition to addressing known predictors, such as paid work experience in high school (e.g., Carter et al., 2012; Simonsen & Neubert, 2012) and parents and teachers having high expectations (e.g., Carter et al., 2012; Papay & Bambara, 2014), we identified examples of academic skills that may be used in entry-level employment and postsecondary education settings, such as “recognizes if there is enough inventory to get through a specified unit of time” or “when writing in team messaging apps or classroom learning management systems is able to convey information and ask and answer questions,” and included them as examples in the framework. Additionally, our framework identified a range of postsecondary education opportunities, as well as factors that may affect an individual’s access to opportunities, for example, transportation barriers or communities that lack resources or opportunities.

To validate the postsecondary opportunities and skills framework, we interviewed key informants. We wanted to gather perspectives on the opportunities available to students with the most significant cognitive disabilities after they graduate or leave high school, as well as on the academic skills needed to pursue them.

Methods

Key informants were identified through a purposeful case-sampling approach based on relevant publications and professional activities related to (a) postsecondary education, (b) secondary transition, (c) vocational rehabilitation, or (d) students with SCD. We sent 11 email invitations to potential participants. Six people agreed to participate, two declined, and three did not respond.

We also wanted to recruit a young adult with SCD and/or their parent(s) to obtain their unique perspectives on the impact of academic achievement on postsecondary employment and education experiences. We contacted one young adult through his mother, who said his work schedule was too unpredictable and offered to be interviewed in his place.

Table B.1 presents the pseudonyms and expertise of the key informants.

Table B.1
Key Informants' Expertise

Key informant (pseudonym)	Expertise
Lee	Postsecondary employment; secondary transition; vocational rehabilitation; research, training, and technical assistance centered around transition; students with significant cognitive disabilities
Kim	Secondary transition, evidence-based practices and predictors of postsecondary success for secondary students with disabilities, interagency collaboration
Tish	Alternate assessment for students with significant cognitive disabilities, content area instruction for students with intellectual disabilities, inclusive education for students with significant cognitive disabilities
Julie	Curriculum and instruction, access to the general education curriculum, and transition to employment for students with severe cognitive disabilities
Kelly	Postsecondary education for students with intellectual disabilities, secondary transition, postsecondary employment
Erin	Postsecondary education for students with intellectual disabilities, secondary transition, postsecondary outcomes
Darla	Parenting a young adult with an intellectual disability who participated in Dynamic Learning Maps assessments while in high school and who was in his senior year in a postsecondary education program at the time of the interview

Study Activities

Interview protocols were developed in advance of the interviews. Questions for experts focused on defining individuals with SCD, academic skills needed to pursue both postsecondary education and employment, and components of students' individualized education program and school day that may help prepare them for postsecondary opportunities. Questions for parents focused on their adult child's high school program and current employment and educational experiences.

Two researchers conducted the semistructured interviews via Zoom videoconferencing. Participant written consent was gathered before the interviews and then reviewed before each interview. Participants were informed that the interview was being recorded, that it would later be transcribed, and that no identifying information would be used. The interviewers asked the questions from the interview protocol but also posed probing questions for further clarification or as additional topics emerged. Each interview lasted approximately one hour.

The two interviewers debriefed immediately after each interview, highlighting the key points gathered and adjusting the interview protocol as needed. They also evaluated the quantity of new information gathered in each interview to determine if more interviews were needed.

Findings

Interviewees shared a range of insights and explanations related to factors that may lead to greater access to postsecondary education and employment opportunities for individuals with SCD. Responses to interview questions were fairly consistent in describing students with SCD, students' school-day activities as they progress through high school, challenges in preparing students with SCD to be college and career ready, and the importance of parental involvement. However, their perceptions of academic skills and their role in preparing students for college and careers differed.

At the beginning of each interview, experts were asked to describe a student with SCD. This was to ensure they were attuned to the population of interest, as well as to set the stage for the rest of the interview. Respondents collectively described individuals with SCD as students who have historically been deemed unemployable because of their disability and who have typically received instruction in functional, independent living skills rather than academic skills. These students are assessed with an alternate assessment of alternate academic achievement standards, require some level of living support throughout their lifespan, and learn more slowly but are able to learn skills with modeling and prompting, allowing them to participate in inclusive living and employment communities.

Interviewees described students' school days in self-contained settings in which they receive instruction that emphasizes functional skills; programs with more resources may provide instruction in community-based settings. Early literacy and math skills, ideally provided with peer supports in inclusive settings, are likely the primary academic foci for students. Literacy-skills instruction may focus on deciphering symbols in picture format for some students. Students typically receive more academic instruction in ninth and tenth grades than in eleventh and twelfth grades, when they often transition to vocational and independent living skills. Interviewees generally believed high school should provide employment or other meaningful experiences that help students develop skills and interests and guide their postsecondary planning.

When considering potential challenges in preparing students with SCD for college and career, "Kim" and "Julie" cited a lack of inclusive practices and limited access to the general education curriculum, both of which may affect student opportunities in postsecondary education programs. In some instances, interviewees stated teachers' philosophical beliefs suggest that SCD do not need to be taught academic skills, and low expectations for SCD provide a greater barrier than any related to a student's abilities. "Tish" stated that parents do not always understand that opportunities are available, thus they do not have the expectation that their child can access opportunities. Other panelists spoke of teachers' low expectations for students with SCD. "Darla" experienced this with her child from sixth grade through high school; she felt he was never challenged and thus did not learn much academically during that time.

Overwhelmingly, our interviewees stated that parents' expectations that their child could work is imperative in facilitating their success toward attaining competitive, integrated employment. Additionally, parents should be involved in transition planning, as they will typically be able to support students in achieving postsecondary goals. However, Kim pointed out that many parents are fearful of their child working or attending college without the protection they had in high school; thus she felt teachers should help parents learn about the available options, beyond sheltered workshops, for their child to contribute to the community. Similarly, Darla felt a

shortcoming in the public school system was the lack of information provided about postsecondary education programs. She found herself informing many other parents of the options and thought many parents believed *secondary transition* referred only to employment.

Interviewees conceptualized the meaning of *academics* differently. Some saw academics as more than reading, writing, and mathematics, also encompassing social skills, social communication, organizational skills, and activities of daily living. Among the more important skills students need to navigate postsecondary life, interviewees identified skills related to counting money, reading skills that may include symbol support (i.e., visual supports) and some ability to write or otherwise communicate their own wants and needs. Darla felt that her son's educational experience provided a strong academic foundation in elementary school, where he was in regular classes and did not receive modifications. He then regressed in middle school, and his high school experience focused more on social learning. She attributed his regression to a lack of expectations by his educators.

Some interviewees perceived the determination that certain academic skills are necessary for access to employment or education as gatekeeping. That is, they did not want the description of any needed academic skills to be seen as a minimum requirement. They feared that requiring individuals be able to read basic sight words for access to postsecondary employment or education opportunities would automatically exclude individuals without that skill. "Lee" echoed their mindset with the belief that while some students will plateau in their learning during or before high school, they should not be excluded from access to the job market.

Ultimately, although key informants did not believe specific academic skills are a baseline requirement for postsecondary employment and educational success for SCD, they did think that communication skills—whether speech or appropriate augmentative or alternative communication—are integral for greater access to opportunities. Especially important are communication skills related to advocating for their needs in employment or educational settings. Another recurring theme was social communication, in other words, how to interact with school personnel and other students in a school setting; these skills would generalize to the greater community after high school. These skills may also include making eye contact, smiling, and other behavior that makes one seem approachable. Kim believed students should be taught communication for different situations, such as navigating a college campus or experiencing recreational opportunities. In postsecondary educational settings, it will be important for students to be able to communicate their understandings in a variety of ways. "Kelly" believed academic skills provide students with the foundation needed to understand work situations and allow them to demonstrate that they know how to learn. She also thought it important to balance increasing reading skills with teaching citizenship and community-awareness skills.

At the conclusion of each interview, we presented the opportunities and skills framework (see Figure 1.2), explained how it was developed and the components contained within it, and asked for a reaction. We wanted to know if anything was missing or if anything in it was misstated. The interviewees agreed that all nonacademic indicators were important and belonged in the framework. Lee was the most critical about the inclusion of academics in the framework. He pointed out that there would be no place for science instruction within the academic or career preparation for some students. He also suggested that the lack of empirical research on specific academic predictors is because for many students, academics are not typically part of their curriculum and ELA, mathematics, and science might be given too much value given the actual experiences of students with SCD. Julie was concerned that the framework indicated the

academics were a minimum requirement and that given limited time with students, there may be other things more important to be taught to some students. “Erin” initially expressed the same concern regarding a baseline requirement but through our conversation, she realized we were not asking to define a minimum requirement but rather trying to gain a broad perspective of the kinds of academic skills that may be used in postsecondary environments.

As a result of feedback from key informants, we added information to the community involvement section centered on opportunities to access social networks in high school. No additions related to academic achievement were made. After the interviews were completed and the minor revision was made to the framework, we used the framework to plan the next phase of this study.

Appendix 4.A: Primary Employment Sector and Employment Opportunities

Sector	Opportunity
Agriculture, food, and natural resources	Dairy farm assistant Dog walker Farmhand Pet sitter Veterinary assistant Wildlife rescue worker
Architecture and construction	Handyperson Landscape
Arts, audio visual technology, and communications	Artist Audio-visual assistant Jewelry maker Musician Photographer YouTuber
Business management and administration	Administrative clerk Data entry clerk Entrepreneur Library aide Paper shredder (self-employed) Receptionist Record scanner
Education and training	Assistant coach Motivational speaker Teaching assistant (preschool)
Health science	Certified medical assistant Certified nursing assistant Hospital guide Patient transportation assistant Surgical sterilization technician
Hospitality and tourism	Baking assistant Environmental services worker Event setup assistant Food deliverer (app based) Food preparer Food service worker Recreational center assistant Vending machine attendant

Sector	Opportunity
Human services	Childcare worker Greeter
Information technology	Gamer (monetized) Help desk technician IT programmer
Law, public safety, corrections, and security	Security assistant
Manufacturing	Assembly-line worker Quality assurance assistant
Marketing	Etsy merchant Flower shop assistant Retail salesperson Self-employed: salesperson (new items) Self-employed: salesperson (resale items) Stock clerk
Transportation, distribution, and logistics	Auto detailer Auto porter Automotive assistant Delivery person Lyft driver Mechanic assistant

Note: Sectors are from the Career Technical Education (CTE) National Career Clusters® Advance CTE (2020) framework. ONETonline.org was used to verify the opportunities within the sectors.

Appendix 4.B: Example Opportunity and Academic Skills Identified by a Panelist

Opportunity: Paper Shredder – Self Employed

Step 1	Step 2	Step 3
What are the responsibilities related to this opportunity?	What are the knowledge, skills, and understandings required?	Which specific academic skill(s) and content area(s) does each relate to?
Maintaining equipment	Understand mechanical systems and safety Oiling the machine	ELA reading comprehension Task Analysis following step-by-step directions
Maintaining confidentiality	Reading Social skills	ELA word recognition Mathematics number identification
Weighing items to be shredded	Zeroing a scale Reading a scale Choosing the correct unit Placing items on a scale	Science using scientific tools Mathematics measurement of weights understanding units for weights, metric or customary
Keeping accurate records	Writing Reading Number identification	ELA written expression Reading reading comprehension Mathematics number comprehension understanding a chart recording items in a chart
Shredding items	How to operate machinery Safety with shredding devices Shredding Removing	ELA reading following step-by-step directions listening comprehension following verbally stated directions
Disposing of shredding items	Bagging shredding Sweeping shredding	ELA reading comprehension following step-by-step directions Science using equipment safely

Step 1	Step 2	Step 3
What are the responsibilities related to this opportunity?	What are the knowledge, skills, and understandings required?	Which specific academic skill(s) and content area(s) does each relate to?
Billing customers	Tracking orders Calculating bill Following up with customers to pay	ELA reading comprehension written expression listening comprehension decoding Mathematics estimation counting greater or less than
Managing a point of sale system for charge cards only	Process bills, Enter sale into machine. Process credit card	ELA reading comprehension written expression decoding Mathematics number identification
Managing a point of sale system for cash and check	Process bills, Enter sale into machine Process sale Give change Basic computer skills	ELA reading writing documenting
Marketing services on social media	Post items on social media platforms Navigate multiple social media platforms Take photos Design posts using various social media platforms. Basic computer skills	ELA reading comprehension decoding sight-word reading responding to messages written expression Mathematics understanding proportions

**Appendix 4.C: Sampling of Soft Skills and
Associated Knowledge, Skills, and Understandings Identified by
Panelists**

Soft skill	Knowledge, skills, and understandings
Social skills	Understands context Listening comprehension Topic choice Asks complex questions
Self-advocacy	Appropriate word choice Asks for help Expresses wants and needs Communicates preferences Summarizes information
Critical thinking	Creates a sequence of steps Identifies a problem Creates a sequence of steps
Budgeting	Reads a chart Understands interest Understands how to use apps to send and receive money
Organizing	Realizes sequential order of completing tasks Estimates time Assigns time to steps Determines next steps Writes to-do list

DLM Ratings of Academic Skills with Alternate Achievement Standards

VIRTUAL MEETING INFO

The Dynamic Learning Maps® (DLM®) Consortium requests your participation in a research study evaluating achievement standards for students with significant cognitive disabilities. Activities include rating academic skills and participating in post-ratings focus groups on the ratings process and postsecondary opportunities for individuals with significant cognitive disabilities. Your state education agency indicated you have experience with either the DLM alternate assessment student population or content area expertise in English language arts, mathematics, or science. We are reaching out to see if you are interested in participating in a one-day, virtual panel meeting on June 22, 2020 (mathematics), June 24, 2020 (English language arts), or June 29, 2020 (science). You would need to independently complete a 1.5 to 2 hour online training before the day of the panel meeting and commit to attending a full-day, virtual panel meeting on your assigned date. You will be compensated \$350 for completing training and the panel meeting.

Your participation in this study is voluntary. If at any time you discontinue the study, your ratings up to that point will be retained. The results of the research study may be published, but all results will be provided in aggregate form. No names or identifying information will be used.

No risks are anticipated as a result of participating in this study. It is possible, however, that through the virtual panel, through intent or accident someone other than the intended recipient may access your responses that are transmitted electronically, or that others present in your location may observe the panel. The benefits of participating in this study include gaining an understanding of academic achievement standards and postsecondary opportunities for individuals with significant cognitive disabilities.

To participate, please visit https://kusurvey.ca1.qualtrics.com/jfe/form/SV_81DR0zVatUgdGux and provide some information about your expertise. Please complete this survey no later than Friday, May 29, 2020, to be considered. We will follow up to confirm panel assignments by June 12, 2020.

If you have any questions regarding the study or your participation, please contact d1m@ku.edu.

VIRTUAL MEETING COMMITMENTS

- Join from a quiet, private space that is free of distractions for the entirety of the meeting. You will be able to take breaks at scheduled times throughout the day.
- Have access to a computer, tablet, or smartphone with a functional video camera and audio headset or earbuds with a microphone.
 - If you use a smartphone for video conferencing, you must also have a computer to manage the work required for the panel.
 - Computer must have an up-to-date browser installed (Chrome, Safari, Firefox).
- Turn off messaging and other notifications during focused time slots on the agenda.
- Have access to a stable, high-speed internet connection that allows for video conferencing.



DYNAMIC®
LEARNING MAPS

Panel meetings use Zoom for audio, video, and screensharing.

Join the computer audio and turn on video. We will begin shortly.



If computer audio fails, audio can be accessed via the phone number, meeting ID, and password in the agenda.

1

A decorative graphic on the left side of the slide, consisting of a vertical column of blue squares connected by thin lines, resembling a network or data structure.

Academic Skills to Support Pursuit of Postsecondary Opportunities

Panel Meeting
June 2020



2

2

Welcome and Introductions: Panelists

- Who you are
- Where you are from
- What you do in life
- Something good about your summer

3



3

Welcome and Introductions: Facilitators

- Who you are
- Where you are from
- What you do in life
- Something good about your summer

4



4

Roles and Responsibilities

Panelists

- Bring your expertise to each part of the panel process
- Use professional expertise and panel training to make ratings
- Use group discussion guidelines and virtual meeting guidelines to help the day run smoothly

Facilitators

- Present a little more training
- Guide you through the process
- Answer your questions
- Facilitate group discussions
- Help you troubleshoot in case of technology issues

5



5

Housekeeping

Materials you need today:

- Agenda
- Performance level descriptors
- Rating guide
- Blank paper for notes (optional)

Other materials you reviewed before the meeting:

- Virtual meeting checklist
- Guidelines for group discussion

We will stick to time slots for breaks as best we can

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6

How We Will Use Zoom Today

- Video on (except during breaks)
- Mic muted unless talking
- Use voting buttons, thumbs up/down, and raise hand when asked to do so



7



7

How We Will Use Zoom Today

- Text chat is okay for:
 - Asking facilitators for help
 - Asking a clarifying question
 - Asking for an example postsecondary opportunity during ratings
- Avoid using text chat privately for side conversations or starting long threads that run parallel to the voice conversation

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Other Reminders

- Be present for this meeting during active meeting time
 - Turn off notifications
 - Ignore phone except in case of emergency
- Remember the guidelines for group discussion
- Remember the informed consent information
 - The process and discussion are confidential; we need you to help keep it that way
 - We are recording the meeting to help with documentation of the procedures and discussions

9



9

Why are we here today?

A series of steps leading to the US Department of Education peer review evidence for Dynamic Learning Maps® (DLM®) alternate assessments:

The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.

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What are we doing today?

1. Training
2. Practice + getting on the same page
3. Main panel activities (ratings, discussion)
4. Post-panel evaluation survey
5. Focus group

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Follow-ups from Advance Training

- Students with the most significant cognitive disabilities are held to high expectations based on alternate academic content standards (Essential Elements).
- Students' results from DLM alternate assessments can be summarized as their overall achievement level in each subject.
 - There are four levels
 - Performance level descriptors (PLDs) describe what students at each achievement level typically know and can do

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Follow-ups from Advance Training

- By the time students leave high school we want them to be prepared for a range of postsecondary opportunities.
- There are many different factors that contribute to student readiness to pursue postsecondary opportunities. Academics are one factor.

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Follow-ups from Advance Training

- Questions about DLM participation criteria
- Access to videos

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Ready to learn about rating?

Vote with buttons



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OVERVIEW OF THE RATINGS

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What You Are Rating

Evaluate academic skill statements relative to performance level descriptors (PLDs)

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Key Question

Using your professional judgment, what is the lowest grade in which a student who achieves At Target on the DLM alternate assessment is 80% or more likely to be able to demonstrate this skill?

18



18

DLM Performance Level Descriptors

- Grade- and subject-specific descriptions of what students typically can do if they achieve at these levels:
 - Emerging
 - Approaching the Target
 - **At Target**
 - Advanced
- Does NOT mean all students can do these things
- Does NOT mean a student can do all of these things

Students who are At Target are proficient and meeting achievement standards.

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At Target

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

The student identifies text elements by

- identifying changes in characters, details, setting, and events
- identifying how the end of a story affects its meaning
- identifying inferred information in a text
- identifying explicit and implicit details that support the meaning of a text
- identifying evidence for a claim
- using key details to summarize an informational text
- identifying main events related to the theme
- identifying evidence for an argument or the meaning of a story
- determining if the claims support the author's argument

The student demonstrates an understanding of language by

- determining the meaning of words and phrases
- using semantic clues to identify word meaning
- determining how words and phrases affect text meaning

The student identifies text structure by

- determining how text structure supports claims
- comparing and contrasting arguments between two texts

When writing, the student

- introduces a topic clearly to convey information
- includes quotes from print sources
- produces grammatically correct simple, compound, and complex sentences
- uses domain-specific vocabulary to strengthen claims
- produces a conclusion
- spells single-syllable words conventionally and phonetically



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Academic Skill Statements

- Derived from postsecondary opportunities identified by a previous panel
 - Employment opportunities
 - Education opportunities
- Each opportunity has associated responsibilities
- Some responsibilities require academic knowledge, skills, or understandings (KSUs)
 - We will call them “skills” for shorthand

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Range of Postsecondary Opportunities

- Postsecondary Employment
 - Veterinary assistant
 - Security assistant
 - Assembly line worker
 - Food delivery person
 - Auto detailer
 - Data entry clerk
 - Baking assistant
 - Certified nursing assistant
 - Receptionist
- Postsecondary Education
 - College program
 - Vocational courses that lead to a certification
 - Apprenticeship
 - Internship
 - Lifelong learning/continuing education
 - Community-based classes

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Example: Baking Assistant

Responsibilities

- Follow multi-step directions (for example, to read a recipe)
- Clean
- Use equipment

Academic KSUs

- Mix of English language arts (ELA), mathematics, and science
- Examples from ELA:
 - Retell and follow a process in proper order
 - Demonstrate knowledge of word meanings across multiple contexts
 - Demonstrate understanding and comprehension of directions

Academic skill statements

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What is the lowest grade in which a student who achieves At Target is 80% or more likely to be able to demonstrate this skill?

Retell and follow a process in proper order

?

At Target in Grade Levels

Before Grade 3

Grade 3

Grade 4

Grade 5

Grade 6

Grade 7

Grade 8

Grade 9–10

Grade 11–12

After Grade 11–12

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REVIEW THE PLDS

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PLDs for This Project

Independent activity:

- Spend a few minutes reviewing the grade levels
 - Make notes or mark signs of progressions
 - What seems to differentiate performance at the grade levels?

We will discuss your observations as a group

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RATING PROCEDURES

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Materials You Need

- Rating guide
- PLDs
- Rating workbook (google worksheets)
 - You will receive an email with a link to your worksheet during this training
- You may want scratch paper

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Panel Process

1. Each panelist completes independent ratings
 - Ask yourself the key question for each academic skill
2. Facilitator reviews consolidated ratings, checks correspondence
3. Panel discusses where needed, seeking consensus
 - Does not require unanimous agreement
 - May end up with multiple answers by adding a second version of the skill statement (more on that later)

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Rating Process

- Evaluate each academic skill statement against the At Target level in Grade 3
- Ask yourself the key question
- Work your way up the grade levels until you find the lowest grade where a student is likely to have that skill

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For Each Skill

1. Record a rating in the online rating sheet
2. Optional: make notes about your rationale, interpretation, etc.
 - Especially helpful if you can think of different ways to interpret the skill

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Key Question

Using your professional judgment, what is the lowest grade in which a student who achieves At Target is 80% or more likely to be able to demonstrate this skill?

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Unpacking the Key Question

Using your professional judgment, what is the lowest grade in which a student who achieves At Target is 80% or more likely to be able to demonstrate this skill?

Less complex version of the skill

Likely to use the skill consistently

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Rating Options

Rating	Definition
0	A student is at least 80% likely to be able to demonstrate the skill before achieving At Target in Grade 3.
3–11	A student is at least 80% likely to be able to demonstrate the skill if they achieve At Target in Grade ____.
13	A student is unlikely to be able to demonstrate the skill until after achieving At Target in Grade 11.
99	Academic skill statement is not specific or clear enough to support any rating (even after reviewing opportunity list).

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Think About...

DO think about:

- How the skill could be used for a range of postsecondary opportunities

DO NOT think about:

- Whether students you personally know could demonstrate the skill
- How much support a student might need to show that skill in the workplace or an educational setting
- How well the skill aligns to language in the PLD

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Before you Choose “99”

- We want to use 99 as a last resort, if the skill isn't ratable
- If you need examples of the opportunities where the student might use this skill, ask via the chat tool and we will give an example or two
- If you still can't see the relationship to any grade, rate it 99 and leave a note about why

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Example Rating Sheet

Academic Skill	PL Code	Notes
Accurately copy information	3	Assumed written words
Accurately decode letters, numbers	4	
Accurately decode time on clock	3	
Classify items by common attributes	0	
Spell correctly when writing	11	

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Questions before we get started?

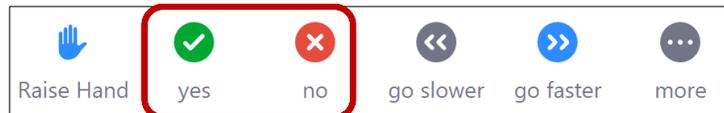
38



38

Ready to try it?

Vote with buttons



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LET'S TRY IT!

40



40

Find Your Rating Sheet

A	B	C	D
Skill ID	Academic Skill	PL Code	Notes
	Retell or follow process in proper order		
	Demonstrate comprehension of information		
	Effectively communicate ideas or needs		

Check your email. You will have a link to your personalized Google sheet.

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About Your Rating Sheet

A	B	C	D
Skill ID	Academic Skill	PL Code	Notes
	Retell or follow process in proper order		
	Demonstrate comprehension of information		
	Effectively communicate ideas or needs		

You cannot edit this column.

You can edit these columns.

23		Use technology to effe
24		Spell correctly when w
25		Decode units of measu
26		Demonstrate compreh
27		Demonstrate compreh
28		Demonstrate letter kno
29		Determine main idea a
30		Effectively communicat

Do NOT rename this tab.

42



42

Let's Do the First One Together

- Look at the statement
- Look at the PLDs
- Answer the key question
- Decide what your code would be
- Let us know when you're ready to discuss
- Discuss ratings



43



43

Key Question

Using your professional judgment, what is the lowest grade in which a student who achieves At Target is 80% or more likely to be able to demonstrate this skill?

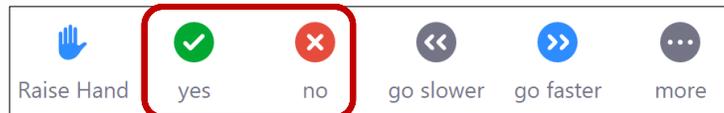
44



44

Ready to try it on your own?

Vote with buttons



45



45

Next Step

Code the next five skills on your own

- Look at the statement
- Look at the PLDs
- Answer the key question
- Record your code
 - Add notes to help with our discussion

We will discuss again when everyone is done

46



46

Discussion of First Set

47



47

Next Step

48



48

Ready for independent ratings?

Vote with buttons



49



49

TRANSITION TO INDEPENDENT RATINGS

50



50

How It Works

- Work independently through the rest of the skills list
 - Facilitators can see your progress in your rating sheet
- You can go off-camera/muted and manage your own breaks
- If you need help, ask via text chat to the whole group or voice chat
- Facilitators will give time checks and answer questions via **text chat** while everyone works; please monitor

51



51

Key Question

Using your professional judgment, what is the lowest grade in which a student who achieves At Target is 80% or more likely to be able to demonstrate this skill?

52



52

Think About...

DO think about:

- How the skill could be used for a range of postsecondary opportunities

DO NOT think about:

- Whether students you personally know could demonstrate the skill
- How much support a student might need to show that skill in the workplace or an educational setting
- How well the skill aligns to language in the PLD

53



53

Hints and Reminders

- Ask for example opportunities when you think a skill is not ratable
 - Text chat to whole group or unmute and ask out loud
- Record your notes to help you remember the reasons for your ratings
- Use the “do/do not think about” list if you find yourself down a rabbit hole

54



54



Independent Ratings In Progress

55



55



GROUP DISCUSSION

56



56

Goals for Discussion

- Review skills for which we didn't have a clear majority from independent ratings
- Facilitator will show the combined ratings
- For each skill we discuss
 - Share the rationale for your rating
 - Listen to each other's perspectives

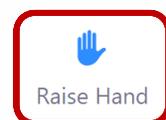
57



57

Discussion Reminders

- Follow group discussion guidelines
- Remember the extra steps needed to make this work in Zoom
- Voice + text are okay for this phase
 - Facilitator will read aloud anything shared via the text chat
 - Raise your hand if you want to speak without interrupting
- Do NOT edit your own sheets now



58



58

Options for Group Decisions

1. By consensus, identify a final rating for the skill
 - Will check agreement with voting buttons
 - Does not have to be unanimous
 - We can make notes about the decision including dissenting views
2. Split the skill, make two versions
 - Useful if the panel is split between interpretations that lead to different ratings

59



59

Group Discussion In Progress

60



60



PANEL RATINGS: WRAP-UP

61



61



Materials and Reminders

- Papers are not secure materials. You may keep or recycle
- Electronic documents are not secure materials. You may keep or delete
- Rating sheets **ARE** secure materials. Do not download, copy, take screen shots, etc.
- Keep ratings and discussion confidential

62



62

Evaluation

Please log in to the training course and complete the panel evaluation.

training.dynamiclearningmaps.org

Once everyone completes the evaluation, we will come back together for the focus group. Let us know when you're ready: 

63



63

FOCUS GROUP

64



64

Purpose

- Take a step back from the ratings
- Get your impressions of academic skills and postsecondary opportunities for students who take DLM assessments

65



65

How it Works

- We have several questions but it is more like a conversation
- Not a round-robin, but we hope everyone will share their opinions
- Please use **voice only** for this section
 - Raise your hand if you want to speak without interrupting



66



66



Focus Group In Progress

67



67



MEETING WRAP-UP

68



68

First: Thank You!

69



69

What Happens Next

- Information from your panel is analyzed and written up for a chapter in the technical report
 - Share with states and the DLM Technical Advisory Committee
- The whole big tech report is posted on the website in late fall and goes to the US Department of Education in December 2020 for peer review

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70

What Happens Next: Payment

- You will receive the forms for your payment within 1-2 days from dlm@ku.edu
- Please fill out the highlighted areas on the first page of the form, and check the two boxes that apply at the bottom of the second page
- Email them back to dlm@ku.edu
- Payments usually take 8-10 weeks for processing

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71

Final Questions or Observations?

72



72



We're Done!
Thank You So Much!

73



DLM Performance Level Descriptors—ELA: Grades 3 - 11/12

Integrated Model

Grade 3	<p>A student who achieves at the at target performance level typically can identify details and ideas, demonstrate an understanding of language, identify feelings, and recognize text structure when reading literature and informational text.</p> <p>The student identifies details and ideas by</p> <ul style="list-style-type: none"> • identifying concrete details • answering who or what questions <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • determining words that complete literal sentences in texts <p>The student identifies feelings by</p> <ul style="list-style-type: none"> • identifying personal feelings • identifying character feelings <p>The student recognizes text structure by</p> <ul style="list-style-type: none"> • using basic text features to locate information • recognizing the beginning, middle, and end of familiar texts • identifying common elements in two texts <p>When writing, the student</p> <ul style="list-style-type: none"> • uses facts and details to write about a topic • expresses more than one idea
Grade 4	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • describing characters and their actions • identifying how characters' actions result in consequences • associating events using details • identifying the narrator of a story • identifying the theme of a familiar story <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • selecting appropriate words to complete literal sentences • determining the meaning of unambiguous words in a text • providing real-world connections between words and their use <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • using pictures or objects related to the text to learn additional information • identifying the main points made in a text • identifying the beginning, middle, and end of a familiar story • determining when two different texts on the same topic make a similar statement <p>When writing, the student</p> <ul style="list-style-type: none"> • identifies words, facts, details, or other information related to a topic

	<ul style="list-style-type: none"> • spells words phonetically using letter-sound knowledge and common spelling patterns • capitalizes the first letter of a sentence
<p>Grade 5</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • identifying and comparing characters • identifying details • identifying setting • identifying major events • identifying how characters' actions result in consequences • finding similarities between key details • identifying two points made by the author, how they relate to each other, and reasons that support the points • determining the narrator and narrator's point of view • identifying the theme or main idea <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • using sentence context to identify a missing word • using context clues to determine meaning • determining the meaning of unambiguous words • identifying similar and opposite meanings • understanding that words have multiple meanings • identifying domain-specific words <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying elements of the story that change from beginning to end • determining if a text tells about events, gives directions, or provides information • using text features to locate information • comparing and contrasting details in two texts <p>When writing, the student</p> <ul style="list-style-type: none"> • introduces an informational topic • conveys information about the topic • provides facts or details related to the topic
<p>Grade 6</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • identifying character feelings and associated actions • identifying details • Identifying events • identifying the narrator <p>The student demonstrates an understanding of language by</p>

	<ul style="list-style-type: none"> • identifying words with opposite meanings • identifying real-world uses of words • identifying words with multiple meanings • determining word meaning using context clues <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying linear parts of a story • understanding the purpose of a text's structure <p>When writing, the student</p> <ul style="list-style-type: none"> • introduces an informational topic • includes facts and details related to the topic • spells phonetically using letter-sound knowledge and common spelling patterns
<p>Grade 7</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • answering explicit questions • identifying key points made in a text • identifying the main idea • identifying the author's point of view <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • using context to identify the meaning of phrases and multiple-meaning words <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • determining the structure of a text • recognizing that titles reflect text structure and purpose • identifying common elements in two texts on the same subject <p>When writing, the student</p> <ul style="list-style-type: none"> • introduces an informational topic and conveys ideas and information • provides facts, details, or information related to the topic • selects domain-specific vocabulary • uses end punctuation • spells words phonetically using letter-sound knowledge and common spelling patterns
<p>Grade 8</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • identifying a character's response to a challenge • identifying emotional change in characters • identifying the main points of a text • identifying details that support the main ideas • identifying the relationships between details

	<ul style="list-style-type: none"> • identifying the author’s point of view and purpose for writing a text • identifying theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • using context to identify the meaning of multiple-meaning words • determining the meaning of idioms and figures of speech <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying the structural similarities of two texts <p>When writing, the student</p> <ul style="list-style-type: none"> • introduces an informational topic and conveys ideas and information • includes one or more facts or details related to the topic • expresses a complete thought • uses domain-specific vocabulary • produces a conclusion
<p>Grades 9-10</p>	<p>A student who achieves at the at target performance level typically can identify text elements, demonstrate an understanding of language, and identify text structure when reading literature and informational text.</p> <p>The student identifies text elements by</p> <ul style="list-style-type: none"> • determining internal and external character traits • identifying evidence that supports explicit information in a text • identifying the relationships between details • identifying details related to the theme <p>The student demonstrates an understanding of language by</p> <ul style="list-style-type: none"> • using context to identify missing words • using context to identify the meaning of multiple-meaning words • determining the meaning of idioms and figures of speech • determining the connotative meaning of words and phrases <p>The student identifies text structure by</p> <ul style="list-style-type: none"> • identifying story elements that change <p>When writing, the student</p> <ul style="list-style-type: none"> • introduces and writes about a topic clearly • develops a topic with facts or details • produces grammatically correct simple sentences • uses domain-specific vocabulary to strengthen claims • produces a conclusion • spells single-syllable words conventionally and phonetically

Grades 11-12

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

The student identifies text elements by

- identifying two related points
- identifying details that defend a claim

The student demonstrates an understanding of language by

- determining the figurative meaning of words and phrases

The student identifies text structure by

- identifying the linear parts of a story

When writing, the student

- introduces a topic clearly to convey information
- includes quotes from print sources
- produces grammatically correct simple, compound, and complex sentences
- uses domain-specific vocabulary to strengthen claims
- produces a conclusion
- spells single-syllable words conventionally and phonetically

DLM Performance Level Descriptors–Math: Grades 3-9/10-11

Integrated Model

Grade 3	<p>A student who achieves at the at target performance level typically makes sense of problems and perseveres in solving them, and identifies repeating calculations or patterns.</p> <p>The student makes sense of problems and solves them by</p> <ul style="list-style-type: none"> • identifying the place value of two-digit numbers to tens • calculating the length of objects using informal units of measurement • identifying shapes divided into fractional parts and shapes that are whole • recognizing the hour and minute on a digital clock display and telling time to the nearest hour • recognizing the structure of a picture or bar graph • answering questions about the data displayed in the graph <p>The student identifies repeating calculations or patterns by</p> <ul style="list-style-type: none"> • solving repeated addition problems (for example, $2 + 2 + 2$ or $3 + 3 + 3$) • classifying data based on given attributes (for example, the number of objects)
Grade 4	<p>A student who achieves at the at target performance level typically calculates accurately, reasons abstractly, interprets data, and makes sense of problems and perseveres in solving them.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"> • adding or subtracting two-digit numbers without regrouping • rounding two-digit numbers to the nearest ten <p>The student reasons abstractly, interprets data, and makes sense of problems and perseveres in solving them by</p> <ul style="list-style-type: none"> • identifying the core unit of a repeating number or symbol pattern (for example, in 123123123, the core unit is 123) • identifying types of angles (for example, obtuse, acute, and right) • counting unit squares to calculate area • using appropriate tools (for example, scales, tiles, or measuring cups) to measure the weight, area, or volume of different objects • identifying fractions up to one-fourth • telling time to the hour and half hour on a digital and analog clock • identifying the values of coins (pennies, nickels, dimes, and quarters) and one-dollar bills • interpreting data on a graph and using that information to answer questions

<p>Grade 5</p>	<p>A student who achieves at the at target performance level typically calculates accurately, reasons abstractly, interprets data, and uses mathematical tools to solve problems.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"> • multiplying numbers by 1 through 5 • identifying fractions with denominators up to 10 • communicating coin names and values (pennies, nickels, dimes, and quarters) • demonstrating beginning division skills (for example, repeated subtraction, dividing groups of objects) <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • communicating the place value of numerals up to the tens place • demonstrating number sense up to 100 by comparing two sets of objects or numerals • recognizing and extending patterns of numbers or symbols <p>The student interprets data by</p> <ul style="list-style-type: none"> • identifying two- and three-dimensional shapes <p>The student uses mathematical tools to solve problems by</p> <ul style="list-style-type: none"> • measuring objects using appropriate tools (for example, a scale to weigh objects or a ruler to measure length) and directly comparing the length or weight of two or more objects • telling time to the hour, half hour, and quarter hour on a digital or analog clock • answering questions and representing data on a bar, picture, or line plot graph
<p>Grade 6</p>	<p>A student who achieves at the at target performance level typically calculates accurately, reasons abstractly, interprets data, and uses mathematical tools to solve problems.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"> • solving word problems involving the area of rectangles • multiplying numbers by 1, 2, 3, 4, and 5 • solving equations using positive and negative numbers • calculating volume of rectangular prisms by packing unit cubes <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • explaining relationships between unit fractions and decimals • representing variables in expressions • representing unknown values in expressions • recognizing equivalent expressions involving addition or subtraction <p>The student interprets data by</p> <ul style="list-style-type: none"> • recognizing the overall shape of data in a graph • identifying outliers in a data distribution <p>The student uses mathematical tools to solve problems by</p> <ul style="list-style-type: none"> • calculating area with unit squares and tiling

<p>Grade 7</p>	<p>A student who achieves at the at target performance level typically calculates accurately, reasons abstractly, and explains reasoning.</p> <p>The student calculates accurately by</p> <ul style="list-style-type: none"> • adding and subtracting fractions with common denominators (for example, $2/5 + 1/5$) • decomposing fractions (for example, $2/4 = 1/4 + 1/4$) • demonstrating the concept of multiplication and division • applying the properties of addition and multiplication to solve problems <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • recognizing angles of different sizes (for example, acute, right, and obtuse angles) • recognizing an arithmetic sequence • recognizing one tenth or tenths on a set model <p>The student explains his or her reasoning by</p> <ul style="list-style-type: none"> • describing attributes of shapes (for example, size and number of sides) • explaining length and perimeter • recognizing the outcomes of an event
<p>Grade 8</p>	<p>A student who achieves at the at target performance level typically makes sense of problems and perseveres in solving them, calculates accurately, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems and calculates accurately by</p> <ul style="list-style-type: none"> • recognizing exponents • representing decimals with tenths and hundredths as fractions (for example, $0.40 = 4/10$) • subtracting two decimals • finding the unknown value in an equation • solving multiplication problems • representing fractions as decimals <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • explaining decimals • comparing angles to a right angle • recognizing figures that have had a transformation (for example, translation, reflection, or rotation) • recognizing congruent figures <p>The student interprets data by</p> <ul style="list-style-type: none"> • reading and representing data on graphs and charts • generating ordered pairs

<p>Grade 9</p>	<p>A student who achieves at the at target performance level typically makes sense of problems and perseveres in solving them, calculates accurately, looks for and makes use of mathematical structures, and reasons abstractly.</p> <p>The student makes sense of problems, perseveres in solving them, and calculates accurately by</p> <ul style="list-style-type: none"> • solving multiplication and division word problems • finding the unknown value in multiplication and division equations • solving real-world problems with rational numbers • solving word problems involving area and perimeter <p>The student looks for and makes use of mathematical structures by</p> <ul style="list-style-type: none"> • recognizing measurable attributes • representing linear equations with one variable • recognizing circles, perpendicular lines, and parallel lines <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • using geometric shape names to describe real-world objects • describing a mathematical situation
<p>Grade 10</p>	<p>A student who achieves at the at target performance level typically makes sense of problems and perseveres in solving them, calculates accurately, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems, perseveres in solving them, and calculates accurately by</p> <ul style="list-style-type: none"> • solving linear equations that include one variable • solving linear inequalities • reporting numerical answers with a degree of precision • representing and solving real-world problems • solving problems using rational numbers <p>The student reasons abstractly by</p> <ul style="list-style-type: none"> • communicating if an event outcome is possible or impossible • communicating whether an event is independent or dependent <p>The student interprets data by</p> <ul style="list-style-type: none"> • calculating the mean of a data set • using graphs to interpret concrete information • communicating an understanding of bar graphs, picture graphs, line plots, and pie charts • explaining the x-coordinate and y-coordinate • interpreting a point within a line on a graph • recognizing covariation within a data set

Grade 11	<p>A student who achieves at the at target performance level typically makes sense of problems, perseveres in solving them, models with mathematics, reasons abstractly, and interprets data.</p> <p>The student makes sense of problems and perseveres in solving them by</p> <ul style="list-style-type: none">• recognizing the recursive rule in an arithmetic sequence <p>The student models with mathematics by</p> <ul style="list-style-type: none">• recognizing and extending geometric and arithmetic sequences• recognizing and explaining similar and congruent figures <p>The student reasons abstractly by</p> <ul style="list-style-type: none">• identifying the theoretical probability of an event <p>The student interprets data by</p> <ul style="list-style-type: none">• solving problems using graphs• interpreting data and using it to make inferences• understanding covariation
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DLM[®] Performance Level Descriptors—Science: Grades 3-High School

Grade 3	<p>A student who achieves at the at target performance level typically can compare weights, classify materials, show how plants get energy, provide evidence that plants are living things, show matter moving in an ecosystem, recognize changes in daylight patterns, recognize how water affects people, and compare ways to protect Earth's resources.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • compare the weights of a material before and after melting or freezing • classify materials by physical properties • use models to show how plants capture energy from sunlight <p>In life science, the student can</p> <ul style="list-style-type: none"> • provide evidence that plants grow • identify a model, such as a food chain, that shows matter moving from plants to animals <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • recognize patterns in the length of daylight hours • recognize how water affects people in a region • compare methods people can use to help protect the Earth's resources
Grade 4	<p>A student who achieves at the at target performance level typically can compare weights, show how plants get energy, provide evidence that plants are living things, show matter moving in an ecosystem, recognize changes in daily patterns, recognize how water affects people, and compare ways to protect Earth's resources.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • compare the weights of a material before and after melting or freezing • use models to show how plants capture energy from sunlight <p>In life science, the student can</p> <ul style="list-style-type: none"> • provide evidence that plants grow • identify a model, such as a food chain, that shows matter moving from plants to animals <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • recognize patterns in the length of daylight hours • recognize how water affects people in a region • compare methods people can use to help protect the Earth's resources
Grade 5	<p>A student who achieves at the at target performance level typically can identify materials by their properties, demonstrate that Earth's gravity is</p>

	<p>directed down, show how plants get energy, show matter moving in an ecosystem, interpret data on seasonal changes, and compare ways to protect Earth's resources.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • identify materials by making observations and measurements of properties • identify evidence of Earth's gravitational pull on objects • use models to describe how energy is captured from sunlight <p>In life science, the student can</p> <ul style="list-style-type: none"> • identify a model that shows matter moving from plants to animals <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • interpret data on a graph to show seasonal patterns in the length of daylight hours • compare methods people can use to help protect the Earth's resources
Grade 6	<p>A student who achieves at the at target performance level typically can gather observational data, investigate ways to change motion, predict change in thermal energy transfer with different materials, model and understand how organs are connected, identify factors that influence the growth of organisms, classify animals, identify weather events that impact landforms, make predictions about future weather, and recognize how humans impact the environment.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • make observations and measurements of properties before and after chemical changes • investigate ways to change the motion of an object • predict how different materials will keep a substance hot or cold <p>In life science, the student can</p> <ul style="list-style-type: none"> • use models to show how organs are connected • identify factors that influence the growth of plants and animals • classify animals by what they eat <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • identify weather conditions that impact landforms • interpret weather forecasts to make predictions • recognize ways that humans impact the environment
Grade 7	<p>A student who achieves at the at target performance level typically can gather observational data, predict change in thermal energy transfer with different materials, understand how organs are connected and function, use data to show that environmental resources influence growth, classify animals, make predictions about future weather, and recognize how humans impact the environment.</p>

	<p>In physical science, the student can</p> <ul style="list-style-type: none"> • make observations and measurements of properties before and after chemical changes • predict how different materials will keep a substance hot or cold <p>In life science, the student can</p> <ul style="list-style-type: none"> • use models to show how organs are connected • use data to show that environmental resources influence the growth of plants and animals • classify animals by what they eat <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • interpret weather forecasts to make predictions • recognize ways that humans impact the environment
Grade 8	<p>A student who achieves at the at target performance level typically can gather observational data, predict change in thermal energy transfer with different materials, model and understand how organs are connected and function, use data to show that environmental resources influence growth, distinguish between catastrophic and non-catastrophic weather events, make predictions about future weather, and recognize how humans impact the environment.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • make observations and measurements of properties before and after chemical changes • predict how different materials will keep a substance hot or cold <p>In life science, the student can</p> <ul style="list-style-type: none"> • use models to show how organs work together to support survival • use data to show that environmental resources influence the growth of plants and animals <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • understand how catastrophic and non-catastrophic weather events change Earth's surface • interpret weather forecasts to make predictions • recognize ways that humans impact the environment
High School	<p>A student who achieves at the at target performance level typically can explain properties, compare safety devices, compare temperatures before and after mixing, identify organ functions, recognize relationships that affect population size, identify factors that affect survival, model Earth's orbit, explain conservation strategies, and organize data.</p> <p>In physical science, the student can</p> <ul style="list-style-type: none"> • make a claim supported by evidence that explains chemical properties • use data to compare the effectiveness of safety devices in

	<p>minimizing forces during collisions</p> <ul style="list-style-type: none"> • compare the temperature of a mixture of two liquids before and after mixing <p>In life science, the student can</p> <ul style="list-style-type: none"> • identify which organs perform specific functions • recognize the relationships between population size, food sources, and available shelter • identify special traits in organisms that allow them to survive in different environments <p>In Earth and space science, the student can</p> <ul style="list-style-type: none"> • model how Earth's position in its orbit corresponds with the seasons • describe reasons for strategies to conserve, recycle, or reuse • organize data on the effects of conservation strategies
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DLM Performance Level Descriptors—Science: Biology

<p>HS Biology</p>	<p>A student who achieves at the at target performance level typically can identify organ function, compare data, model relationships about cells and body size, use graphical representations to explain changes in population, interpret evidence about traits of parents and offspring, identify environmental factors that affect survival, and use mathematical models to determine the effect of human actions on a species.</p> <p>The student demonstrates knowledge of life science by</p> <ul style="list-style-type: none"> • identifying which organs work for a specific function • comparing data before and after change • modeling the relationship between the number of cells and the size of a body • using a graphical representation to explain the dependence of an animal population on other organisms for food and their environment for shelter • using evidence to show that parents and offspring may have different traits • identifying factors in an environment that require special traits to survive • using a mathematical model to determine which human actions harm or help a species
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DLM Ratings of Academic Skills with Alternate Achievement Standards Virtual Meeting Checklist

Before your panel meeting starts, make sure you have / have done the following:

Technology

- Computer, tablet, or smartphone with a functional video camera and audio headset or earbuds with a microphone.
 - If you use a smartphone for videoconferencing, your computer is set up to complete your work as a panelist.
 - Computer must have up-to-date browser installed (Chrome, Safari, Firefox).
- Secure, stable high-speed internet connection that allows for videoconferencing.

Other

- Quiet, private space that is free of distractions for the entirety of the meeting. (You will be able to take breaks at scheduled times throughout the day.)
- Turn off messaging and notifications during focused time slots on the agenda.
- Familiarize yourself with the materials mailed to you and those provided in Moodle and have them accessible during the group meeting.

Support

- On the day of the panel meeting, you can contact DLM staff at (785) 864-7461 if you need assistance joining the Zoom call.
- If you have any questions regarding the study or your participation, please contact d1m@ku.edu.

Guidelines for Productive Virtual Group Discussions

- 1. Share responsibility for including all voices in the conversation.** If you tend to have a lot to say, make sure you leave sufficient space to hear from others. If you tend to stay quiet in group discussions, challenge yourself to contribute so others can learn from you.
- 2. Listen respectfully.** Do not interrupt or engage in other conversations while others are speaking. Comments that you make (whether asking for clarification, sharing critiques, or expanding on a point) should reflect that you have paid attention to the previous speakers' comments.
- 3. Be open to changing your perspectives based on what you learn from others.** Try to explore new ideas and possibilities. Think critically about the factors that have shaped your perspectives. Seriously consider points-of-view that differ from your current thinking.
 - a. Strive for intellectual humility. Be willing to grapple with challenging ideas.
 - b. Let go of personal, anecdotal evidence and look at broader group-level patterns.
- 4. Understand that we are bound to make mistakes in this space,** as anyone does when approaching complex tasks or learning new skills. Strive to see your mistakes and others' as valuable elements of the learning process.
- 5. Understand that your words have effects on others.** Speak with care. If you learn that something you've said was experienced as disrespectful or marginalizing, listen carefully and try to understand that perspective. Learn how you can do better in the future.
- 6. Take pair work or small group work seriously.** Remember that your peers' learning is partly dependent upon your engagement.
- 7. Understand that others will come to these discussions with different experiences from yours.** Be careful about assumptions and generalizations you make based only on your own experience. Be open to hearing and learning from other perspectives.
- 8. Adjust your habits to fit the virtual environment.** Facial expressions and nonverbal cues can be harder to see during video meetings. If you are worried about interrupting, raise your hand or use the conference system's reaction tools to get other people's attention. Keep your mic on mute when you aren't speaking, to minimize background noise and make it easier to hear the conversation. Take steps to remove distractions from your environment so you can stay focused on the discussion. Let the people in your physical environment know when to expect you to be available and unavailable based on the meeting schedule.

Appendix 5.F: Sampling of Academic Skills and Final Ratings

Subject	Academic skill	Final rating
ELA	Accurately copy information	0
	Accurately identify letters and numbers	0
	Read familiar words with accuracy and understanding	0
	Accurately record information	3
	Organize data in chronological order	3
	Read with accuracy and understanding	3
	Use technology to produce and publish information	3
	Accurately record information in a chart	4
	Decode units of measurement	4
	Discern fact from opinion	4
	Demonstrate knowledge of word meanings across multiple contexts	5
	Engage in collaborative discussions	5
	Write to convey information supported by details	5
	Read sentences with fluency and inflection	6
	Accurately use standard English mechanics and grammar	9/10
Mathematics	Express number of objects with numerals	0
	Identify total number of objects of a set by counting	0
	Identify data type in a picture or bar graph	3
	Add and subtract multidigit numbers (without regrouping)	4
	Identify directions on a map using the compass rose	4
	Add and subtract multidigit numbers (with regrouping)	5
	Estimate size of an object using known referents (e.g., length, area, volume, mass/weight, etc.; standard measurements)	5
	Record data in an existing chart (e.g., numerical data)	5
	Estimate quantities to get an approximate result	6
	Identify ratio relationship between two quantities	6
	Add and subtract time intervals (e.g., minutes or hours)	7
	Convert measurement units using ratios	8
	Identify percent of a quantity	8
	Record data on a chart (e.g., ordered pairs)	8
	Divide money by whole number (e.g., identifying payment)	9
Science	Demonstrate a knowledge of simple machines and be able to use them	0
	Classify foods that are spoiled and not spoiled	3

Subject	Academic skill	Final rating
	Use technology to research weather conditions and sunset/sunrise information	3
	Accurately use measurement tools for liquids and solids to measure the appropriate	4
	Use graphs and charts to interpret data	4
	Analyze tables and graphs to determine patterns and trends	5
	Apply knowledge of the behavior of light to correctly use a tool	5
	Express how heat is used in the baking process (e.g., conduction, radiation, convection)	6
	Identify characteristics that impact plant growth	6
	Demonstrate a knowledge of characteristics (e.g., behaviors, signs) for healthy and unhealthy animals	Biology
	Implement a health maintenance and a disease and disorder prevention plan for animals in their natural and/or confined environments	Biology
	Measure and approximate quantities to the appropriate precision of measurement across multiple contexts	High school science
	Use knowledge of chemical reactions to decide the appropriate safety gear to put on	High school science
	Apply knowledge of animal (i.e., individual and populations) behavior in interactions with a variety of different animals	Biology / high school science
	Determine when an animal health concern needs to be referred to an animal health professional	Biology / high school science



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MEMORANDUM

TO: DLM

FROM: Claudia Flowers, Professor of Research, Measurement, and Evaluation 

DATE: September 1, 2020

RE: External Review of Academic Skills to Support Pursuit of Postsecondary Outcomes Study

I was asked to serve as an external reviewer for the *Academic Skills to Support Pursuit of Postsecondary Outcomes Study*. I serve on DLM's Technical Advisory Committee and have over 15-years' experience working with alternate assessments that are designed for students with significant cognitive disabilities (SWSCD). This memo is organized into four sections: (a) Purpose of the Study, (b) Materials Reviewed, (c) External Review Results, and (d) Summary.

Purpose of Study

The *2020 Academic Skills to Support Pursuit of Postsecondary Outcome* study was designed to provide evidence to (a) demonstrate Dynamic Learning Maps Alternate Assessment (DLM-AAS) performance level descriptors (PLD) (at target only) alignment to postsecondary outcomes' knowledge, skills, and understanding (KSU), and (b) provide evidence to support DLM's validity argument (i.e., SWSCD need to be taught appropriately challenging content linked to college, career, and citizenship standards that will prepare them for postsecondary opportunities) and intermediate outcomes (i.e., SWSCD make growth throughout their academic career and are prepared for postsecondary options). This evidence will be used to address the U.S. Department of Education Standards, Assessment, and Accountability Peer Review Critical Element 6.3, which states:

The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.

Mathematics, English Language Arts (ELA), and Science panelists were asked to evaluate academic KSU statements relative to the *at-target* PLDs. The key question for panelist was,

Using your professional judgment, what is the lowest grade in which a student who achieves “At Target” on the DLM alternate assessment is 80% or more likely to be able to demonstrate this skill?

Using grades 3 to 11 *at-target* PLDs, academic KSU statements (i.e., knowledge, skills, and understandings that were identified in multiple employment and educational opportunities), panelists were asked to rate the alignment using the following scale:

- 0 = A student is at least 80% likely to be able to demonstrate the skill before achieving At Target in Grade 3.
- 3 to 11 = A student is at least 80% likely to be able to demonstrate the skill if they achieve At Target in Grade ____.
- 13 = A student is unlikely to be able to demonstrate the skill until after achieving At Target in Grade 11.
- 99 = Academic skill statement is not specific or clear enough to support any rating (even after reviewing opportunity list).

Materials Reviewed

The materials reviewed for this memo include an asynchronous Advanced Training session and synchronous all-day virtual meeting. Prior to the virtual operational session, the panelists were provided several videos, documents to review, and a self-evaluation of the Advanced Training. A written introduction was provided that described materials and upcoming activities. Materials included:

- Seven videos (70 minutes)
 - Who are students with significant cognitive disabilities? (14-minutes video)
 - Postsecondary opportunities for students who take DLM assessments (12-minutes video)
 - DLM Essential Elements (13-minutes video)
 - What do the DLM assessment measure (6 minutes)
 - What is skill mastery? (4 minutes)
 - What information is contained in a score report? (7 minutes)
 - DLM performance level descriptors (5 minutes)
- Self-evaluation after Advanced Training (7 items that asked panelist to rate their knowledge of content from the videos and one item that allowed panelist to write any questions that they might have to tailor the training for the virtual meeting)
- Confidentiality Statement
- Informed Consent
- Cover letter (providing times for upcoming virtual activities)

About two days before the virtual session, panelists were provided access to a package that included:

- Panel meeting agenda
- Virtual meeting checklist
- Rating guide

- Performance level descriptors (at target)

During the virtual operational session, panelists were provided a link to a Google sheet of the academic KSU statements on which to record their ratings and a PowerPoint slide deck that organized the session and activities. At the end of the virtual session, panelists were directed to a 13-item questionnaire to evaluate their experiences in the virtual session.

While the meeting was originally planned to be face-to-face, due to Covid-19, all sessions were conducted in the online virtual environment. Videos for each session (Mathematics, ELA, and Science) were provided to the TAC for asynchronous review. Each video was just over 5 hours.

External Review Results

Since this is the first time this methodology has been used, there are no “best practices” for evaluating this study. I used a modification from evaluation criteria from alignment studies, standard setting, and rater agreement for the focus of this evaluation. This section of the memo is organized into five parts: 1) Materials, 2) Training, 3) Panelists, 4) Facilitators, and 5) Implementation.

Materials

Materials were distributed three times during the study, (1) during Advanced Training, (2) several days prior to ratings, and (3) during the virtual face-to-face. The materials were reviewed based on the following three features: (a) appropriateness of content, (b) appropriateness of design and delivery, and (c) overall quality of materials.

All materials were appropriate for the audience and were aligned with the objectives and goals of the study. While panelists did not necessarily need to have all the information about SWSCD and alternate assessments to conduct the ratings, it was needed for providing context, common language, and rationale for the upcoming activities. Even panelists with limited knowledge of SWSCD gained an understanding of the needs and academic standards for this student population. Overall, all materials contributed to and enhanced an understanding needed to participate in the very complex task of rating. Given that panelists were required to rate KSU statements to grade level *at-target* PLD, the organization of materials, from *Advanced Training* to virtual meetings, presented the materials in a logical progression, from easy to more difficult. For example, panelists were given content information (e.g., Who are the students) in *Advanced Training*, but the most difficult activities (i.e., how to apply the ratings) were conducted in the virtual meeting. Given the complexity of the tasks, DLM maintained a balance which avoided overwhelming the panelists while providing enough information to allow them to successfully engage in all activities.

Access to the *Advanced Training* materials provided panelists opportunities to view the materials to better meet their needs. Given the online nature of all activities, the organization and navigations were logical and easy to follow. While it might have been easier to conduct the face-to-face meeting in person (i.e., distributing materials), the virtual meeting checklist and PowerPoint presentation provided the guidelines for how to participate in the virtual environment. I did not observe any

confusion about where the materials were located or how to access the rating forms. Additionally, one facilitator was designated to address any technical problems during the virtual meetings, which prevented delays due to virtual environment problems or inability to find materials.

The presentation and quality of all materials were professional. The videos were well produced, with both appealing visual and verbal descriptions that maintained the attention of the viewers. Most experts recommend that training videos should only be as long as it takes to meet training objectives. There is some evidence that suggests 6 to 9 minutes is the optimal length for instructional videos (see Guo, Kim, & Rubin, 2014), but it is difficult to see how to shorten some of the longer videos and still present the necessary information for this study.

Training

The objectives and importance of training were clearly stated during the *Advance Training* and the virtual meeting. The instructions and guidance provided by the facilitators were clear and included multiple opportunities to assess panelists' understanding. The materials and PowerPoint presentation were easy to follow, with no panelists appearing confused about the upcoming activities and expectations. All panelists had an opportunity to actively participate in training activities and ask questions for clarification. Panelists could also use the chat box to ask questions. Before moving to the next topic panelists were polled on their understanding. The facilitators monitored panelists' participation and would call on specific panelists when there appeared to be a lack of participation or differences in ratings.

The facilitators created a comfortable and safe environment for all panelists. For example, throughout the entire training, the lead facilitator emphasized the importance of "diverse views and opinions" and told panelists that they were selected for different areas of expertise, which would naturally lead to different opinions. The facilitator also provided wait time for panelists to think through their reasoning and rationale for ratings. Evaluations were conducted at the end of the Advance Training and virtual session and results indicated that most panelists (92% to 96%) understood the topics in the training.

Part of the training included a calibration session, which was used to train panelists and provide the opportunity for them to see the reasoning of other panelists. The facilitator asked panelists to independently rate one academic KSU then meet as a group for consensus building. Next, panelists rated 5 KSU statements independently, and again met as a group to come to a consensus. Panelists were offered another opportunity to rate another 5 KSUs if needed or to independently rate the remaining KSUs. None of the panels requested an additional calibration session. Below is an example of the first rating for mathematics.

Panelists were asked to align the KSU statement of "Add & subtract money e.g., account balance for a specific period of time" to the lowest grade in which a student who achieves at-target PLD on the DLM alternate assessment is 80% or more likely to be able to demonstrate the skill. After independently rating and recording their response on a Google sheet, which was monitored by the facilitators, they met as a group to discuss their ratings. For this example, the ratings ranged from grade 4 to grade 11. As they talked about the skill and rationale, they

agreed that grade 9 (adding and subtracting 2 decimal numbers) was the best fit. There was some discussion about whether the KSU statement aligned with grade 8 or 9. If working with whole numbers (\$2), grade 8 PLDs aligned but if decimals (\$2.32) were used, 9th aligned best. The level of specificity was often discussed with panelists wanting more details about the KSU statements (i.e., Can you give us an example of how this KSU is used in an occupation?).

Observations of the calibration activities suggested panelists increased their agreement with each other and created a frame-of-reference for using the information to inform ratings. Additionally, a support document was developed that reminded panelists that the focus of their ratings should be on how the skill could be used for postsecondary opportunities and should not focus on specific students, supports, or the specification of the language in the PLDs. This document was referred to multiple times during the discussions.

The evaluation results supported the effectiveness of training. Based on the evaluation results, 18 panelists reported that they agreed or strongly agreed that “The advance and meeting-day training prepared me to complete my activities” while 2 panelists disagreed or strongly disagreed with this statement. Nineteen panelists agreed/strongly agreed with the statement, “The overall goals of the ratings panel meeting were clear” while one panelist strongly disagreed.

Another indication of the quality of the training is the number of KSU statements that needed to be discussed at the end of rating all items. The panelists reached consensus on 59% of the mathematics, 54% of the ELA, and 48% for science without any discussion or consensus building needed.

Panelists

Panelists were recruited to meet specific criteria, which included (a) general educators who had expertise in multiple grades, (b) familiarity with DLM alternate assessments, (c) special educators who taught SWSCD who took the DLM assessments, (d) ability to attend the panel discussion, (e) equal representation of content and special education educators, (f) years of experience, and (g) represented multiple states. Ten panelists were selected for each panel, but only 8 for ELA, 7 for mathematics, and 8 science panelists completed the Advance Training and/or provided consent. To reach the grade band coverage for science, an additional science panelist was recruited, which resulted in 9 panelists.

Using the criteria for recruitment, the panels were representative of the inclusion criteria. Panelists were from 9 states and represented a balance between special educators, general educators, and dual licensed teachers. Over half of the panelists had over 16 years of experience. All the panels had a mix of elementary, middle, and high school teachers except for ELA. Most of the ELA panel were high school level ($n=6$), with only 1 middle school and 1 elementary school educator.

Based on observations, all panelists were knowledgeable in their area and able to actively and meaningfully participate in all activities. While some panelists were more verbal than others, all panelists had the opportunity to discuss their ratings and provide rationale for their ratings. The size of the panels was reasonable given the complexity of activities in an online environment and provided a diversity of opinions and ideas.

Facilitators

There were three ATLAS staff members who facilitated the meetings. Two of the facilitators focused on implementing the rating activities and the third facilitator provided technical support and managed the online environment.

From my observations, all facilitators were knowledgeable of the materials and the process. The lead facilitator did not drive or dominate the discussions and she created an environment where panelists' comments and opinions were respected and valued. Panelists were reminded of the value of their opinion and the difficulty of the tasks. The lead facilitator would repeat or sum up panelists' comments to ensure everyone understood the rationale for the ratings. Strategies for engaging all panelists were used and while at times specific panelists dominated the discussion, the facilitator was able to encourage quieter panelists to engage in the discussion, especially if they had divergent opinions. The facilitator was able to tactfully either bring saturated discussions to a close or to let the discussion continue until a consensus was met, which required the ability to think on her feet and shift the agenda.

The evaluation results confirmed that the discussions were open and honest and most of the panelists viewed their participation as a valuable professional development experience.

Implementation

While the meeting was originally planned to be face-to-face, due to Covid-19, all sessions were conducted in a virtual environment. All three panels followed the same implementation structure:

- **Introductions and Housekeeping**
 - Welcome and Introductions
 - Roles and Responsibilities
 - Housekeeping – materials panelist would need, guidelines for group discussion, and virtual meeting checklist
 - Using Zoom – using video, muting mic if not talking, voting buttons, and use of chat
 - Reminder of why they were participating in this activity and the importance of the activities
 - A preview of upcoming activities
 - Follow-up to Advance Training
- **Rating Activities**
 - Review and discussion of PLDs (at target) - What differentiates the levels?
 - Rate the first academic skill independently then meet as group to come to a consensus
 - Rate a set of 5 academic skills independently, then meet as group to come to a consensus (calibration)
 - Rate all remaining skills independently, then discuss items that required either consensus or editing/splitting the skill to accommodate different ratings
- **Post Rating**
 - Online Evaluation
 - Focus group

There was a high level of implementation fidelity across all panels. As expected given the virtual environment, there were some minor adjustments to the schedule. For example, the online evaluation was moved to the last activity and the focus group was moved up, which saved time during the virtual session. For the science panel, there was not enough time to conduct the focus group, but this was the largest panel with 9 panelists.

Compared with face-to-face meetings, online virtual meetings can be fragmented, hard to follow, difficult getting everyone to contribute, and more exhausting than face-to-face meetings. Given these challenges, it was obvious to me that the facilitators spent time preparing for that environment or had experience working in the virtual environment. For example, the facilitators knew exactly what needed to be discussed, estimated how much time was needed for each activity, and created breaks and down time for panelists to keep engaged. They also set ground rules that guided behaviors of panelists (see Virtual checklist) and asked panelists to use their video during the discussions and mute their mic when not talking. Facilitators developed strategies for getting everyone involved and helped them monitor their attention level while keeping them engaged.

Even given the complexity of the activities and the all-day online meeting, most panelists were able to maintain attention. In observations, panelists' discussions were not as robust at the end of the day compared to the beginning, but the quality of the ratings or panelists' responsiveness did not deteriorate.

Evidence from the focus group provided a social validity check on the activities. Most of the panelists clearly saw the strong connection between what they taught in K-12 schools and how important it is for preparing students for postsecondary school opportunities and success. As one panelist stated, "Now when students ask me why they need to know this stuff, I can tell them why." There were some special educators who reported their students were not able to do any of the KSU and did not have the opportunity in their communities to successfully engage in the postsecondary school opportunities that they were evaluating.

Summary

Based on observations, review of materials, and results of surveys, it is my opinion that the *2020 Academic Skills to Support Pursuit of Postsecondary Outcome Study* implemented by DLM was highly effective and produced ratings based on the best judgement of a diverse group of experts. The table below summarizes my findings. Across all areas, DLM successfully gathered evidence that allows the evaluation of the alignment between the DLM-AAS PLDs and the academic KSU statements.

A critical question in this review is, "Would another panel arrive at similar results?" Since independent panelist's ratings were recorded, DLM has an opportunity to estimate rater variability. I also attempted aligning the KSUs to the PLDs and noted it was very dependent on how I interpreted the KSUs and the PLDs. In some KSU statements there did not appear to be enough specificity in the description to pinpoint an exact grade level. DLM did provide additional information about how the KSU was used in the occupation, which allowed the panelists to place the KSU in context. But, while I believe there might be variation in the grade level selected for the PLD, it was clear to me when the panelists were not able to find any connection to the PLDs. I

believe the data are viable for creating evidence examining if “*The alternate academic achievement standards are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or competitive integrated employment.*”

I believe data collected for this study provides richer information about alignment of alternate academic achievement standards to postsecondary outcomes than traditional predictive studies (i.e., correlation of AA results to postsecondary measures) that are often used to satisfy the U.S. Department of Education Standards, Assessment, and Accountability Peer Review Critical Element 6.3. But if this study is only being used to satisfy Critical Element 6.3, I would question the cost effectiveness of committing so many resources to meet a required reporting standard. If the outcomes of the study are used to improve the transition services and postschool outcomes for students with significant cognitive disabilities, the expenditures would be well worth the outcomes. Using the study outcomes to work with transition experts and the National Technical Assistance Center on Transition would create an understanding of blending the in-school academic and functional achievements needed to facilitate students’ movement from school to postsecondary endeavors.

Rating Elements	Questions	Evaluation
Materials	<p>Were the materials appropriate and aligned to the objectives of the study?</p> <p>Were the materials designed and delivered in a manner that was accessible and easy to understand?</p> <p>What was the overall quality of the materials?</p>	<p>The materials were appropriate and aligned to the goals and objectives for the study.</p> <p>Panelists accessed all materials with minimal confusion, asking only a few questions for clarity.</p> <p>All materials were high quality.</p>
Training	<p>Were the objectives clearly stated?</p> <p>Was the guidance clear?</p> <p>Were evaluations conducted to assess the panelists’ readiness to participate?</p>	<p>The objectives of the study were stated at the beginning, during, and at the end of all activities.</p> <p>Guidance was clear with multiple opportunities for panelists to check their understanding and ask questions as needed.</p> <p>Evaluations were completed after Advanced Training and after completion of the virtual meeting. Readiness checks were also evaluated during the calibration sessions.</p>
Panelists	Were panels recruited to be	Serious attention was given to

	<p>representative of important expertise and characteristics?</p> <p>Did the panelists have the knowledge and skills to rate the KSU statements to the PLDs?</p> <p>Was the size of the panel sufficient to provide a range of diverse views?</p>	<p>recruit panelists who understood SWSCD and/or understood the subject areas. When recruitment efforts fell short, additional recruitment was conducted (e.g., science panel). The ELA panel was unbalanced in the school levels represented (6 high school, 1 elementary school, and 1 middle school), but did not pose a problem in rating the early grade PLDs.</p> <p>Most panelists had the knowledge and skills to rate the alignment between the KSU statements and the PLDs. Some of the special educators appeared unsure of their ratings at first, but gained a better understanding during the calibration session.</p> <p>While each panel was originally designed to have 10 panelists, between 7 to 9 panelists per session was sufficient to provide a range of diverse views. In fact, the size of the science panel might have contributed to its inability to complete all the activities.</p>
<p>Facilitators</p>	<p>Were the facilitators knowledgeable of the materials and process?</p> <p>Did the facilitators provide opportunities for all panelists to voice their opinion?</p> <p>Did the facilitators create a virtual environment that valued panelist opinions?</p>	<p>The two ATLAS facilitators had a deep knowledge and understanding of all materials and processes. The third facilitator worked quietly behind the scenes to keep the online environment running smoothly for all participants.</p> <p>All panelists were given opportunities to voice their opinion and there was no pressure to change their ratings. Because panelists' ratings were being electronically monitored, the facilitators were able to call on specific panelists to provide a rationale for their ratings.</p> <p>The panelists were told at the beginning, during, and at the end of all activities that all opinions were</p>

		valued. Given the challenges of conducting all day virtual meetings, DLM did an exceptional job organizing and implementing the virtual meetings.
Implementation	<p>Were the activities implemented as designed?</p> <p>Was there sufficient time allotted to complete all activities?</p> <p>Were rest breaks built into the process to allow panelists time to rest?</p> <p>Were strategies used to overcome some of the challenges of conducting a virtual meeting?</p>	<p>There was a high level of implementation fidelity across all panels. Some minor changes were made to improve the flow of the meeting.</p> <p>There was sufficient time for the mathematics and ELA panels to complete all activities. The science panel did not have time to participate in the focus group at the end of the session.</p> <p>Scheduled rest breaks were taken and during the independent rating session, panelists could take breaks as needed.</p> <p>The facilitators oriented all panelists to the virtual environment and established ground rules for participation. The addition of a third facilitator to handle all technical/environmental issues, kept the meeting running smoothly.</p>

References

Guo, P. J., Kim, J., & Rubin, R. (2014). *How video production affects student engagement: An empirical study of MOOC videos*. Proceedings of the first ACM conference on Learning @ scale conference. <https://doi.org/10.1145/2556325.2566239>

Appendix 6.B

Resolution of the Dynamic Learning Maps Technical Advisory Committee on the DLM Postsecondary Opportunities Study

It is the understanding of the Dynamic Learning Maps (DLM) Technical Advisory Committee (TAC) that the U.S. Department of Education now requires states to demonstrate that assessments used in the states support successful student postsecondary student college and career transitions. Because of this requirement, DLM staff embarked on a postsecondary opportunities study on behalf of DLM member states. The postsecondary study was designed to provide evidence that the DLM achievement standards support students' pursuit of postsecondary education and/or employment opportunities.

The DLM TAC advised the DLM consortium regarding the postsecondary opportunities study in several ways.

1. The TAC provided DLM staff with on-going advice on the design and implementation of the study.
2. A member of the TAC attended the final set of panel meetings and provide her evaluation to the full TAC for discussion.
3. The TAC reviewed the final study design, study results, and the technical report that described both the study design and study results.
4. Finally, the TAC discussed various interpretations and implications of the study.

Because of the care that went into the design and implementation of the study, the TAC believes that the study was implemented in a sound manner and the results will be useful to member states as they seek to enhance students' postsecondary college and career opportunities.

At its meeting on October 27, 2020, the TAC unanimously approved this resolution in support of the technical quality of the postsecondary opportunities study and the utility of the findings from the study.

Russell Almond
Karla Egan
Claudia Flowers
Robert Henson
Joan Herman
James Pellegrino
Ed Roeber, Chair
David Williamson
Phoebe Winter