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Developing Effective Writing Instruction for Students with Significant Cognitive Disabilities

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Welcome! Thank you for attending this presentation. This presentation focuses on developing effective writing instruction for students with significant cognitive disabilities. Your presenters are Jonathan Schuster, Amy Clark, and Russell Swinburne Romine, both from the University of Kansas.

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Presentation's Goals

- Describe the cognitive writing approach used in the Dynamic Learning Maps® (DLM®) English language arts (ELA) assessment for this student population
- Describe a study examining the written products of students with significant cognitive disabilities based on their complexity
- Introduce professional development modules that support teachers in delivering appropriately complex writing instruction for all students
- Describe ways to adapt writing instruction to meet the needs of individual students



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We have four goals for today's presentation.

First, we will describe the cognitive writing approach that the Dynamic Learning Maps® (DLM®) assessment uses as part of the English language arts (ELA) assessment.

Next, we will describe a research study examining the written products produced by students with significant cognitive disabilities as part of the DLM assessment in ELA.

Next, we will introduce professional development modules supporting teachers in developing and delivering appropriately complex writing instruction for all students.

Finally, we will describe multiple ways to decrease or increase writing instruction's complexity to meet an individual student's needs.

Student Writing Sample Study



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The first portion of this presentation will describe the DLM assessment and the cognitive writing approach for students with significant cognitive disabilities. It will also cover the Student Writing Sample Study that we conducted in 2020.

Dynamic Learning Maps Alternate Assessment

- The DLM assessment measures student achievement in ELA, mathematics, and science for students with significant cognitive disabilities in grades 3–8 and high school.
- The assessment aims to improve student performance and outcomes through the establishment of challenging but attainable academic targets.
- It provides teachers with practical and effective support when making instructional decisions by indicating what students currently know and can do in a content area.



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The DLM assessment results provide teachers with practical and effectual support when making instructional decisions by indicating what students currently know and can do in a content area.

DLM Definition of Writing

- Writing is the process of constructing texts in traditional orthography that communicates experiences, thoughts, feelings, and understandings for diverse audiences and purposes.
- It requires the planning and organizing of relevant topical information and then the reviewing of the written product.
- Students do not need to know how to use a pencil to start using one.
- Students do not need to know letters before they start using an alternate pencil.
- Students do need a writing tool that works for them and that allows them to focus on the print or Braille they are producing.



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The DLM assessment considers writing to be the process of constructing texts in traditional orthography that communicates the writer's experiences, thoughts, feelings, and understandings for diverse audiences and purposes. Because it focuses on traditional orthography and communication simultaneously, this definition represents a substantive and substantial shift from traditional writing approaches for students with significant cognitive disabilities.

The writing process also involves planning and organizing relevant topical information before writing, and then reviewing and revising the resulting written product.

Students with disabilities do not need to know how to use a pencil before using it. Getting comfortable with the pencil and understanding that moving the pencil produces marks are crucial writing development steps.

Similarly, students do not need to know letters before they can start using an alternate pencil. Drawing and scribbling can occur long before students gain a firm understanding of the letters in the alphabet.

Finally, students only need an appropriate writing tool that allows them to focus exclusively on their writing and what they would like to communicate and not on the physical act of writing.

Different Types of Writers

- Emergent writers can produce the marks, scribbles, lines, and randomly selected letters demonstrated by beginning writers.
- Transitional writers can produce sequences of recognizable words when applying their gradually expanding understanding of writing conventions.
- Conventional writers can sequence and spell words with a sufficient degree of convention that teachers can read what they write.



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We consider three types of writers that take alternate assessments.

Emergent writers can produce the marks, scribbles, lines, and randomly selected letters typically demonstrated by beginning writers.

Transitional writers can produce early sentences containing recognizable words representing the early use of their gradually expanding understanding of writing conventions.

Conventional writers can compose grammatically correct and complete sentences that are easily understood by others.

Purpose and Research Questions

- Effective writing instruction requires an understanding of writing development and the individual student's needs.
- Limited information exists about the writing development of students with significant cognitive disabilities.
- We answered the following research questions:
 - What do written products look like for students with significant cognitive disabilities?
 - How do the written products differ in complexity within and across grades?



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Writing is a crucial element of literacy. However, we know little about writing development for students with significant cognitive disabilities. Most students in this population are emergent writers and require individualized writing instruction on mechanics and text production. We need more information on their written products to develop effective writing instruction.

To this end, we conducted this study to answer two research questions:

- What do the written products produced by students with significant cognitive disabilities look like? We are interested in whether the written products represent strings of letters, a word list, a couple of grammatically correct sentences, or a text containing related sentences about the same topic.
- How do the written products differ in complexity within and across grade levels? We would like to know whether the written products within the same grade level are similar in their appearance and characteristics and whether the written products become gradually more complex across grades.

Research Method

- Teachers submitted the writing products of students with significant cognitive disabilities produced during the DLM assessment administration for an annual scoring review.
- We collected 421 writing samples of students in grades 3–12 across 2017–2019.
- We identified teacher-provided responses to specific questions on the First Contact survey for the 2017–2018 writing samples.



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Teachers of students with significant cognitive disabilities submitted the written products produced by their students in response to writing items during the DLM assessment administration for an annual scoring review.

We collected 421 writing samples of students in grades 3–12 between 2017 and 2019.

For the 2017 and 2018 writing samples, we also identified the teacher-provided responses on the First Contact survey about the students who produced them. The First Contact survey asks multiple questions about the student's characteristics, such as receptive and expressive communication, academic skills, attention, and sensory and motor characteristics.

Rating System

- We used the Development Writing Scale (DWS) for beginning writers (Sturm, Cali, Nelson, & Staskowski, 2012) to rate the student writing samples.
- The DWS contains 14 levels representing different stages in writing development.
 - Ratings ranged from drawing through coherent multi-paragraph texts.
- Raters completed training to reach consensus on each DWS level.
- Two raters identified the DWS level of each writing sample.



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We used the Development Writing Scale (DWS) for beginning writers to rate the student writing samples. The DWS contains 14 levels that represent multiple stages through which students advance in writing development. It ranges from simple drawing at the lowest level through the composition of multiple-paragraph texts that are coherent and cohesive.

In the Student Writing Sample Study, four independent raters completed a training period on some samples to reach a consensus on using the rating system. Following training, the raters identified the DWS level representing all collected writing samples, with two raters evaluating each writing sample.

Results

- We excluded eight samples due to the absence of written content, unreadable content because of poor image quality, or the presence of only the student's name.
- We calculated inter-rater reliability on the ratings for the 2017 and 2018 samples.

Year	N	ICC	ICC Lower Bound	ICC Upper Bound	Fleiss's <i>k</i>
2017	122	.97	.96	.98	.64
2018	105	.98	.97	.99	.57



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We excluded eight writing samples from the analysis because they either 1) did not contain any written content, such as a blank page, transcribed content, or content produced through an AAC device, 2) was unreadable due to low image quality, or 3) had only the student's name.

We calculated inter-rater reliability on the 2017 and 2018 writing samples. According to widely used guidelines, the inter-rater reliability demonstrated that the four raters were consistent in their ratings of the student writing samples.

DWS Ratings of Student Writing Samples

Grade Level	Count	Mean Rating (SD)
3	22	8.34 (2.25)
4	61	6.30 (3.28)
5	19	9.13 (2.75)
6	46	9.72 (2.72)
7	60	8.69 (3.39)
8	63	10.24 (2.70)
9–10	87	9.28 (3.87)
11–12	55	7.03 (3.99)
Total	413	8.59 (3.56)



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Overall, we rated over 45 samples per grade level except for grades 3 and 5. Writing levels varied considerably within grades, while median values increased across grades.

On average, the student writing samples ranged from 1) producing two or three different identifiable words separated by spaces or in a list, and 2) composing three or more unrelated incohesive sentences.

DWS Ratings of Student Writing Samples

Grade Level	Emergent (%)	Letters (%)	Words (%)	Sentences Plus (%)
3	0 (0%)	1 (5%)	7 (32%)	14 (64%)
4	11 (18%)	15 (25%)	10 (16%)	25 (41%)
5	0 (0%)	2 (11%)	4 (21%)	13 (68%)
6	1 (2%)	2 (4%)	7 (15%)	36 (78%)
7	3 (5%)	9 (15%)	11 (18%)	37 (62%)
8	2 (3%)	3 (5%)	3 (5%)	55 (87%)
9–10	12 (14%)	3 (3%)	9 (10%)	63 (72%)
11–12	9 (16%)	11 (20%)	10 (18%)	25 (45%)



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To get a better idea of the writing samples' breakdown, we used the assigned ratings to categorize them in four writing development stages. These stages are emergent writing (drawing and scribbling), letter production, word production, and sentence and text composition.

Most of the student writing samples contained partial or complete sentences and texts with multiple sentences across all eight grade levels. The fewest number of student writing samples in each grade level primarily represented emergent level writing. The variability in the complexity of the written products within each grade level underscores the need to adapt writing instruction for individual students. With increasing knowledge and experience, students with significant cognitive disabilities can produce more complex texts.

First Contact Survey Results

- Students who used one or more hand to perform tasks produced written products of greater complexity than students who did not.
- Students who demonstrated high ability levels in reading ability and receptive communication produced higher-rated writing samples than students who exhibited low ability levels.
- Students who could combine two or more spoken or signed words or symbols in expressive communication composed more complex written products than students who could only produce a single spoken or signed word or symbol.



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On average, writing samples composed by students who had the use of one or more hand were higher rated than writing samples produced by students without using either hand.

For both reading and receptive communication, students who demonstrated higher ability levels in these areas produced higher-rated writing samples than students who exhibited lower ability levels.

Finally, students who combine two or more spoken or signed words or symbols in expressive communication composed higher-rated writing samples than students who only produce a single spoken or signed word or symbol.

DLM Professional Development Modules



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The next section will introduce the DLM professional development writing modules about planning and implementing effective writing instruction for all students.

Writing Modules

- DLM staff created a series of professional development (PD) modules to help teachers develop appropriately complex writing instruction for students with significant cognitive disabilities.
- The modules cover a wide range of topics related to writing instruction.
- The modules emphasize that
 - writing development emerges over time
 - students need access to the whole alphabet
 - teachers should support meaningful composition for diverse communicative purposes and audiences



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In conjunction with the Center for Literacy and Disability Studies at the University of North Carolina-Chapel Hill, DLM staff created a series of professional development (PD) modules that help teachers develop appropriately complex writing instruction for students with significant cognitive disabilities.

The modules cover a wide range of topics involved in writing instruction and the writing process in general. We will discuss some of them later in the presentation.

The modules emphasize that writing development emerges over time. Emergent writers can begin writing development before they can write words, identify letters, or communicate clearly with others. The modules also stress the need for students to have access to the whole alphabet when writing. Finally, they emphasize that teachers can support the meaningful composition of text for diverse communicative purposes and audiences.

Components of Effective Writing Instruction

- Students should attribute meaning to their written product.
- Students should have access to augmentative and alternative communication (AAC) devices.
- Teachers should provide aided language input on the use of AAC devices.
- Teachers should include appropriate core vocabulary.
- Instruction should be meaningful to the students.



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Effective writing instruction for students with significant cognitive disabilities includes multiple components.

Students should have the opportunity to attribute meaning to their written products, which will help them understand that written communication is meaningful.

Next, students should have access to appropriate augmentative and alternative communication (AAC) devices according to their needs. Teachers should model these devices' use and potentially expand them over time as students advance in their learning.

Also, teachers should provide aided language input on AAC devices by helping students learn the meaning of words and symbols.

Fourth, teachers should include appropriate core vocabulary that is useful to students when communicating with others.

The final component of effective writing instruction is that instruction is naturalistic, engaging, and meaningful to the students.

Writing with Alternate Pencils

- Every student needs a pencil.
- The alternate pencil module
 - describes the goals and use of alternate pencils for students with significant cognitive disabilities
 - helps teachers to identify multiple forms of alternate pencils and use the most appropriate form to meet each student's needs
 - explores the use of alphabet eye-gaze frames when communicating with students with significant cognitive disabilities



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A critical topic in writing instruction for students with significant cognitive disabilities is writing with alternate pencils. The alternate pencil module emphasizes that every student needs a pencil. Alternate pencils make it possible for students who cannot use conventional pens, pencils, and computer keyboards to compose written text by focusing on other related developing abilities.

The module describes that the goal of alternate pencils for students with significant cognitive disabilities is to provide students with diverse ability levels with access to regularly occurring writing activities. When provided with multiple opportunities to interact with alternate pencils, students with significant cognitive disabilities can become more sophisticated in their writing abilities.

The module also has teachers consider the different types of commercially available alternate pencils, such as big keys, labelers, alphabet eye-gaze frames, and print alphabet flip charts. The selected alternate pencil should align with what the student can do and be easy for them to use.

Finally, the module explores alphabet eye-gaze frames when communicating with students with significant cognitive disabilities. Alphabet eye-gaze frames are color-coded to determine what are the intended letters based on different combinations of eye-gazes.

Emergent Writing

- This module describes the goals of emergent writers:
 - how to use a pencil
 - how to construct understandings
 - how to represent ideas
 - understand that writing is communication
- Instruction should provide students with meaningful and interesting topics about which to write and informative feedback.



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The emergent writing module introduces the characteristics and goals of emergent writers. Because emergent writers are still developing their understanding of writing conventions, instruction should facilitate their understanding by focusing on 1) how to use a pencil, 2) how to construct understandings, 3) how to represent ideas, and 4) understanding that writing is a form of communication.

Writing instruction should provide emergent writers with meaningful, interesting, and engaging topics about which to write. These topic choices help students think of something to write about and identify relevant information about it. They will also help teachers support student writing by providing a context for giving informative feedback about the written product, especially when the student's writing is unreadable.

Emergent Writing

- The emergent writing module
 - helps teachers analyze writing samples to determine the student's understanding about writing
 - focuses on writing concepts, the use of a conventional or an alternate pencil, and language
- Emergent writing tasks should have students
 - choose a topic
 - communicate about the topic
 - write about the topic using pencils, keyboards, and other alternatives that provide access to the full alphabet



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The emergent writing module helps teachers analyze student writing samples to identify the student's understanding of writing conventions. Teachers can focus on specific characteristics of the student's writing process and products to gather this information.

These characteristics fall within three categories: writing concepts, the use of a conventional or an alternate pencil, and language. For example, characteristics about writing concepts include the understanding that writing consists of making marks, goes from left to right, and from the top of the page down, and that words are made up of letters. With this information, teachers can track their progress over time and celebrate successes.

Tasks for emergent writers should have students with significant cognitive disabilities choose a topic, communicate about the topic, and write about it using pencils, keyboards, or other alternatives that provide access to the full alphabet.

Predictable Chart Writing

- This module describes how predictable chart writing is valuable for students with significant cognitive disabilities at the emergent writing level.
 - I like _____.
- Students select a topic and then compose sentences using sentence frames.
- Sentence frames increase student engagement.
- Instruction should focus on the words in the stem.



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The predictable chart writing module describes how predictable chart writing is valuable for students with significant cognitive disabilities at the emergent writing level. Predictable chart writing is a shared writing activity that provides students with some structure and the flexibility to generate their ideas of what to write and use their learned vocabulary. For example, a potential sentence frame is “I like ____.”

In predictive chart writing activities, teachers introduce the predictable writing chart by modeling how to complete a sentence by selecting a suitable word to fill in the gap. Students can then brainstorm on different words that could complete the sentence and other sentences provided in the chart. Students would read the constructed sentences and rearrange the words to form new sentences. Because they select the topic and choose the words to complete sentence frames, they actively participate in the activity, learning first-hand what sentences are and how individual words combine to form them.

Text Types and Purposes

- This module helps teachers to identify natural writing opportunities in the instructional day.
 - Natural writing opportunities are events occurring during the student's day that engage their interests and provide motivated writing opportunities.
- The module has teachers consider ways through which the audience could respond to student writing.



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The text types and purposes module helps teachers identify natural writing opportunities in the instructional day. Natural writing opportunities engage the student's interests and provide motivated writing opportunities. They do not have to be remarkable, but they do have to be worthy of writing.

Besides natural writing opportunities, the module has teachers consider ways through which the audience could respond to student writing. For emergent writers, teachers can have students read their written product. They can have conventional writers provide more information about the topic in their written product.

Text Types and Purposes

- Students should learn how to produce writing for a range of purposes.
- Lesson plan design should
 - set up tasks or purposes that are meaningful to students
 - provide students with access to traditional orthography
 - make sure the intended audience responds to the written product
- Teachers should first help students to write routinely before helping them to improve their writing.



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The text types and purposes module also describes how effective writing instruction can produce writing for diverse purposes. Students will learn that writing is a way of supporting their opinions, demonstrating their understanding of a subject, or conveying information about a topic.

For effective writing instruction, lessons should 1) set up tasks or purposes meaningful to the students, 2) provide students with access to traditional orthography, and 3) make sure the intended audience responds to the written product.

Teachers should focus on increasing the range of writing by first helping students write easily and routinely before assisting them in writing better. Examples of ways to improve the ease of writing routinely include having students make a list of activities they enjoy at home and school and sharing their writing with classmates daily. For improving the quality of student writing products, teachers can have students apply one writing rule at a time or use planning software to organize information about the topic.

Adapting Writing Instruction for Individual Students

- Adjust the complexity of the sentence frames and word choices.
- Include additional content to the written product.
- Include additional components to the written product given the text type and writing purpose.
- Include additional steps in the writing process based on the purpose and target audience.



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Because students with significant cognitive disabilities vary in writing abilities, it is crucial to adapt writing instruction to meet an individual student's needs.

One method of adapting writing instruction is to adjust the sentences produced during predictable chart writing. Teachers can consider the length and complexity of the sentence frame and the types of words included in the sentence frame.

Another method is through increasing the amount of content presented in the written product. Teachers can have students include additional content about the topic in their written products. Other options are to highlight the order and relationship between the content or insert an ending to the written product. Teachers can provide leading questions to guide students through this process.

A third method of adapting writing instruction is to have students include additional components to the written product. Students can provide additional events or main ideas for narratives and informative texts, respectively.

A final method is to have students complete additional steps in the writing process. For example, students could consider what facts, details, or ideas are the most important for the target audience and writing purpose before writing, and then review and revise the written product to resolve unclear or missing information.

Conclusion

- Students with significant cognitive disabilities can compose coherent texts of multiple sentences.
- The cognitive writing approach used in the Dynamic Learning Maps (DLM) assessment provides the students with the opportunity to combine traditional orthography and communication for diverse purposes and audiences.
- The DLM PD modules support teachers in delivering appropriately complex writing instruction for all students.
- Teachers can adapt their writing instruction through multiple means to meet the needs of individual students.



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In conclusion, this presentation covered the writing abilities of students with significant cognitive disabilities and what effective writing instruction can look like.

The cognitive writing approach used in the DLM assessment allows students to combine traditional orthography and communication for diverse purposes and audiences.

Students with significant cognitive disabilities can compose coherent texts of multiple sentences.

The DLM PD modules support teachers in delivering appropriately complex writing instruction for all students.

Teachers can adapt their writing instruction through multiple means to meet the needs of individual students.

Thank you!



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Thank you for attending the presentation.