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AA-AAS: How Do Our Students Learn and Show What They Know?

Introduction

Over the past several decades, powerful insights have been gained into how students represent knowledge and develop competence in specific domains. We also are learning how tasks and learning opportunities can be designed to provide evidence for inferences about what students know and can do across a full range of performance. The growing body of evidence that students with significant cognitive disabilities can learn academic content has motivated educators to rethink previous models of learning that were developmental in nature and focused heavily on the skills students were lacking when compared to their same age peers.[1]

This Brief presents the conceptual model of learning and understanding that was the basis for the development of the NCSC mathematics and English language arts resources.[2]

Conceptual Model of Learning and Understanding

Two of the dominant perspectives for understanding how learning occurs[3] are the behaviorist and situative perspectives. The **behaviorist** perspective is rooted in applied behavior analysis and promotes the use of task analyses where content or skills are broken down into measurable and observable steps. This perspective has had a strong influence on the education of students with disabilities, but does not address how students organize and use knowledge.

The **situative** perspective places an emphasis on how learning is mediated by one's environment, including peers. There is substantial research showing the benefits of learning in an inclusive environment for students with significant cognitive disabilities.[4] Another concept derived from the situative perspective is the importance of opportunity to learn and practice skills in real world contexts.

Both the behaviorist and the situative perspectives are reflected in the NCSC Model of Learning and Understanding. The NCSC model provides a conceptual foundation for the NCSC Curriculum and Instruction (C&I) materials.[5]

[1]Source: Kleinert, H. L., Browder, D. M., & Towles-Reeves, E. A. (2009). Models of cognition for students with significant cognitive disabilities: Implications for assessment. *Review of Educational Research, 79*, 301-326.
[2]See https://wiki.ncscpartners.org to view the C&I materials.
[3]Source: Pellegrino, J., Chudowsky, N., & Glaser, R. (Eds.). (2001). *Knowing what students know: The science and design of educational assessment.* Washington, DC: National Research Council.

[4]Sources: Jackson, L. B., Ryndak, D. L., & Wehmeyer, M. L. (2010). The dynamic relationship between context, curriculum, and student learning: A case for inclusive education as a research-based practice. *Research & Practice for Persons with Significant Cognitive Disabilities, 33-4* (4-1), 175-195.; Matzen, K., Ryndak, D., & Nakao, T. (2009). Middle school teams increasing access to general education students with significant disabilities: Issues encountered and activities observed across context. *Remedial and Special Education, 31*, 287-304.; Peetsma, T., Vergeer, M., Roeleveld, J., & Karsten, S. (2001). Inclusion in education: Comparing pupils' development in special and regular education. *Educational Review, 53*, 125-135.
[5]Source: Browder, D. M., Gibbs, S. L., Ahlgrim-Delzell, L., Courtade, G., Mraz, M., & Flowers, C. (2008). Literacy for students with severe developmental disabilities—what

A behaviorist perspective is reflected in materials such as the MASSIs[6] and LASSIs[7] that use a systematic approach to instruction, but also include evolving models of how to form a graduated understanding that builds from big ideas. A situative perspective is reflected in other NCSC C&I materials such as the grade-level Universal Design for Learning (UDL) units, which promote instruction in an inclusive environment and provide examples of real world applications of the targeted skills and knowledge.

Conceptual Foundation for Grade-aligned Mathematics Instruction

Past Practice and a New Approach

Access to grade-aligned mathematics content is necessary for students to develop 21st century skills. For students with significant cognitive disabilities, there is often a discrepancy between achievement in math and expectations for their chronological age.

Some educators approach mathematics instruction by beginning at the developmental level of skills students are missing and teaching through the traditional sequence of skills. Others, who teach students with mild cognitive disabilities, may choose to remediate several grade levels of content in a year. Sometimes educators have simply bypassed general curricular expectations in math in favor of teaching the most essential skills needed for daily living, like purchasing or measurement. These approaches may restrict opportunities to learn age- and grade-appropriate content and restrict inclusive learning.

Given the limitations of previous approaches to math instruction, NCSC's C&I materials for math are based on a different approach. The idea behind this approach is to teach students the math content of their assigned grade and chronological age, with the content prioritized to focus on the critical content for progressing from grade to grade, and supports provided to compensate for not yet mastered prerequisites. This approach assumes that when grade-aligned math content is taught in a meaningful context, and appropriate supports and scaffolds are provided, students with significant cognitive disabilities can be successful.

What are we learning from studies of what is possible with reasonable instruction?

Research on teaching math content has provided evidence that students with significant cognitive disabilities can learn skills within the context of grade-aligned content. Two recent studies[8] demonstrated that middle and high school students with intellectual disability or autism could use a task analysis and graphic organizer to solve word problems linked to state standards. The authors suggest that when students are taught number sense and other early numeracy concepts, these skills can be applied to grade-aligned content in general education classes. It may be necessary to use smaller numbers, less complex examples, and technology such as calculators to compensate for missing skills.

A six step grade-aligned process to promote numeracy skills creates access to the general education curriculum

A six-step process for creating grade-aligned lesson plans has been developed, based on what has been learned from research:

1. Select the content and objectives for the lesson from grade-level content targeted by the general education teacher or prioritized with content partners within and across grades.

should we teach and what should we hope to achieve? *Remedial and Special Education, 30*, 269-282.
[6]Mathematics Systematic Structured Instruction
[7]Language Arts Systematic Structured Instruction

[8]Studies showing success with mathematics content: Browder, D. M., Jimenez, B., & Trela, K. (2012). Grade-aligned math instruction for secondary students with moderate intellectual disabilities. *Education and Training in Autism and Developmental Disabilities, 47*, 373-388.; Browder, D. M., Trela, K., Courtade, G. R., Jimenez, B. A., Knight. V., & Flowers, C. (2012). Teaching mathematics and science standards to students with moderate and severe developmental disabilities. *The Journal of Special Education, 46*, 26-35.

Summary of Math Approach

- Students should receive intensive early skills instruction in early grades
- Focus on the standards of the grade level, building early skills through grade- and age-appropriate applications
- Use real-life and high interest context and evidence-based practices
- Provide students with a step by step process and supports to compensate for not yet mastered skills

2. Identify a real-life activity for the lesson to give the content purpose.
3. Use evidence-based practices with content broken into smaller objectives and sequenced.
4. Use instructional supports and graphic organizers to keep track of steps to solve the problem.
5. Plan methods to monitor progress (both steps used to solve and number of problems solved).
6. Promote generalization through application to untaught problems and different real-life situations.

Conceptual Foundation for Grade-aligned English Language Arts (ELA) Instruction

Past Practice and a New Approach

In the past, reading instruction for students with disabilities focused on accessing text through sight reading of functional words. Sight words can be used in some functional applications, but do not provide access to literature and informational text, both of which require managing passages of text. Text has little purpose unless students gain meaning, and decoding without comprehension is not useful for future learning or life.

Browder and colleagues[9] proposed a conceptual model for literacy that focuses on listening comprehension while also building the capacity for as many students as possible to learn to access text through decoding. The NCSC C&I materials for ELA were developed based on this conceptual model. Regardless of a student's potential to decode, being able to understand a text passage, whether it is read independently or accessed through technology or a human reader, is the most important goal of literacy. This idea is especially important when considering how students will demonstrate understanding. For students with significant cognitive disabilities, the assessment of standards on gaining meaning from text must be separated from the demands of decoding.

Text comprehension focus does not negate decoding instruction

Similar to math, there is a body of research that provides guidance for teaching early reading skills to all students with significant cognitive disabilities,[10] including those who are non-verbal.[11] The pace of learning to decode

[9]Source: Browder, D. M., Gibbs, S. L., Ahlgrim-Delzell, L., Courtade, G., Mraz, M., & Flowers, C. (2008). Literacy for students with severe developmental disabilities—what should we teach and what should we hope to achieve? *Remedial and Special Education, 30*, 269-282.

[10]Studies providing guidance on teaching reading: Bradford, S., Shippen, M. E., Alberto, P., Houchins, D. E., & Flores, M. (2006). Using systematic instruction to teach decoding skills to middle school students with moderate intellectual disabilities. *Education and Training in Developmental Disabilities, 41*, 333-343; Browder, D. M., Ahlgrim-Delzell, L., Flowers, C., & Baker, J. N. (2012). An evaluation of a multicomponent early literacy program for students with severe developmental disabilities. *Remedial and Special Education, 33*, 237-246; Flores, M. M., Shippen, M. E., & Alberto, P. (2004). Teaching letter-sound correspondence to students with moderate intellectual disabilities. *Journal of Direct Instruction, 4*, 173-188; Ganz, J., & Flores, M. (2009). The effectiveness of direct instruction for teaching language to children with autism spectrum disorders: Identifying materials. *Journal of Autism and Developmental Disorders, 39*, 75– 83.

[11]Source: Heller, K. W., Frederick, L. D., Tumlin, J., & Brineman,

Summary of ELA Approach

- Language arts for students with significant cognitive disabilities should reflect access to the general curriculum.
- Use literature and informational texts from the student's assigned grade level and focus on the grade-level content, with an alternate achievement literacy focus.
- Work within and across grades to ensure students benefit from language arts that progress with increasing levels.

is typically steady but very slow, and requires multiple years to achieve a single year of progress when compared to typical peers of students with significant cognitive disabilities.

Educators should continue to teach decoding skills as students reach middle grades, but by this time alternate ways to gain fluency in meaning from text will need to be established to ensure age- and grade-appropriate access to the general curriculum. For example, all LASSIs include a brief summary of the targeted text, an approach that provides opportunities for emerging readers to practice decoding skills. The majority of the lesson is conducted by the teacher, who reads aloud to the students the adapted text and excerpts from the original text.

Methods used to teach and assess multiple standards

An interactive read aloud can be an efficient way to teach and assess multiple standards in reading for a student's assigned grade level. Interactive read alouds or shared stories are an evidence-based practice for students with significant cognitive disabilities.[12] There is evidence that interactive read alouds are effective when providing access to grade-level literature to a wide range of students including those with complex multiple disabilities who may have few entry level literacy skills.[13] In most cases supports and scaffolds are used to make the text accessible, including summarizing passages, object supports, and summarizing repeated sentences.

Alternate Achievement Literacy

The term *alternate achievement literacy* is used to refer to the approach of using text adaptations and interactive read alouds to address standards for students participating in alternate assessments.[14] Once students are given alternatives (e.g., text read aloud) to augment any emerging decoding skills, the focus of instruction can be the standards of the student's assigned grade level.

Developing lessons using this approach

Several decisions must be made when developing a language arts lesson using an alternate achievement literacy approach.

D. G. (2002). Teaching decoding for generalization using the nonverbal reading approach. *Journal of Developmental and Physical Disabilities, 14*(14), 19-35.

[12]Source: Hudson, M. E., & Test, D. W. (2011). Evaluating the evidence base for using shared story reading to promote literacy for students with extensive support needs. *Research and Practice for Persons with Severe Disabilities, 36*, 34-45.
[13]Studies showing the effectiveness of read alouds with a range of students: Browder, D. M., Lee, A., & Mims, P. J. (2011). Using shared stories and individual response modes to promote comprehension and engagement in literacy for students with multiple, severe disabilities. *Education and Training in Autism and Developmental Disabilities, 46*, 339-351; Mims, P., Browder, D., Baker, J., Lee, A., & Spooner, F. (2009). Increasing comprehension of students with significant intellectual disabilities and visual impairments during shared stories. *Education and Treatment in Developmental Disabilities, 44*, 409-420; Mims, P., Hudson, M., & Browder, D. (2012). Using read alouds of grade-Level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism and Developmental Disabilities, 27*, 65-78.
[14]The term "alternate achievement literacy" was coined by: Fleury, V., Hedges, S., Hume, K., Browder, D., El Zein, F., Thompson, J. L., Reutebuch, C., Fallin, K., & Vaughn, S. (2014). Academic performance of secondary students on the autism spectrum. *Remedial and Special Education, 35*, 68-79.

1. Select the target text—same as assigned grade level targets, with opportunities for inclusive instruction, interaction with peers.
2. Adapt text as needed—look for picture supports and headings already included; some texts may need simplification or a summary.
3. Augment the text for understanding. This may include providing picture symbols for key vocabulary, a summary sentence that is repeated, or highlighting key vocabulary. "No more different than necessary" is a general rule of thumb.
4. Identify multiple ways (e.g., human reader, technology) that the student could access the text. The passage should always be in view so the student can apply his or her reading skills. During instruction, the student should have the opportunity to request to "read it again" if he or she is unsure of the answer to a comprehension question. A "reread" can be requested using either the symbol provided for "reread" or the student's own communication system.
5. Consider how the student will demonstrate understanding. Although some students with significant cognitive disabilities will have a speech or communication system to generate answers to open-ended questions, many will need to select from an array of responses (e.g., words or pictures). Response options should be familiar to students or pre-taught prior to being used for responding.

Summary

By basing the NCSC C&I resources on a model of learning that promotes (a) the use of evidence-based strategies, (b) instruction provided in a meaningful context, and (c) the provision of supports and scaffolds, general curriculum access becomes achievable for students with disabilities. Studies designed to pilot the C&I materials have already demonstrated that students with significant cognitive disabilities can have success with rigorous academic content that is aligned with grade level standards.

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