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STEP=UP

Special Teachers and Exceptional Pupils = Urban Promise

Features

Important Dates

- March 10:
  4:00pm —4:50pm
  SPED 448
- April 14:
  4:00pm —4:50pm
  SPED 448
- April 28:
  4:00pm —4:50pm
  SPED 448

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What is vocabulary?

We've had requests to reexamine work we have gathered through the years of STEP=UP. In the upcoming newsletters, we reproduce (with updates) classic articles from our newsletter archives. For this edition, we focus on word study. We examine meaning-making with words and terms especially in mathematics and science to facilitate comprehension for students with disabilities.

When you read, how do you come to comprehend what you are reading and how to make meaning? Part of making meaning, whether we read a store sales flier, magazine, comic book, newspaper, book, or textbook, is to understand the associations as well as individual words and ideas. The National Reading Panel (2001) has described three main areas crucial for good reading comprehension instruction. First, reading is a complex cognitive process and integral to it is vocabulary development. Secondly, comprehension is an active process that requires an intentional and thoughtful interaction between the reader and the text. Thirdly, teachers and teacher candidates need to develop a repertoire of reading comprehension strategies in order to help their students.

While vocabulary building and instruction are key for comprehension, what is vocabulary? We talked with a group of experienced special educators in Chicago Public Schools and saw the following big ideas from their conversations. Literacy is communication that surrounds us in the everyday environments in which we live and learn. A high school English teacher, Judi Arroyo, talked about using scrapbooks her students created to track story plots and predict what might happen next. Aaron Brown, a mathematics high school teacher, discussed how he displays information on his bulletin boards. He guides and teaches them – how to look at those and more broadly use that learning as a way to see actual strategies for gaining information all around their environments. Another principle is the importance of connecting the words and meanings to students' lived experiences. Have students immediately put the word or term into a textual and social context, teachers suggested. Morgan Gallagher, an elementary special educator, worked with vocabulary by using graphic organizers to link related words and then link them with familiar elements. Learning words is tricky, he said, because recognizing the words and even using them in one context might not mean a student can generalize and use the words in different situations. Gladys Hampton, a special educator who does pull in and push out services, has taken a theatrical approach. She has students act out the meaning of the word, providing students with other kinds of associations (she calls them "feelings") to help them learn and connect meanings across ideas.

While we often associate learning vocabulary with getting ready to read a new book, word meaning has to be reviewed when teaching daily living skills. Jennifer Clayton talked about a "writing with symbols" book that paired descriptive words about winter with pictures. Another teacher, Dave Rench, brought in examples of word cards that kids can manipulate at their desks, and can concurrently see up on a word wall. Those who cannot read and/or are non-verbal, use pictures. Students actually see and use the cards and word wall whenever they need a reminder. In such ways, reading comprehension can draw on words images.

These educators suggest that vocabulary can be thought of as a tool for organizing and explaining the world. Teachers need to expose students to varied and rich vocabulary and help students become aware that words and phrases are situated; that is, they take on different meanings in different contexts.

Meaning Making in Math & Science

Mathematics and science education standards developed by the National Council for Teachers of Mathematics and the National Research Council create a new vision for mathematics and science teaching and learning.

The focus of school mathematics is no longer limited to procedural and computational fluency. It includes making sense of the mathematics in real world contexts where mathematics functions as a tool to manage and sometimes solve a host of authentic problems such as shopping, cooking, figuring out if you have enough money for snacks. We see a growing importance for encouraging students to engage actively in doing mathematics and explaining their reasoning to peers and teachers.

Similarly, the focus of school science is not limited to only content (conceptual learning) and instead includes an inquiry approach in which students describe objects and events, ask questions, construct and test explanations, communicate ideas to others, identify assumptions, and consider alternative explanations. By so doing, students actively develop their understanding of science by combining knowledge with reasoning and thinking skills.

While this approach opens up several possibilities for students with disabilities, it is essential to find ways of supporting students in their efforts to make meaning, communicate and engage in activities. In our conversations with accomplished special educators we heard them stress the significant role of word meanings in mathematics and science instruction. Often teachers assume that students share the meaning of the words with them. This is problematic with same-sounding words (such as “some” and “sum”) and words like “triangle” that could evoke different visual images for the student and the teacher.

Moschkovich(2002) highlights the importance of moving away from deficit notions of a student’s vocabulary and their failure to use a mathematical term and instead focus on the strengths and resources they bring that can help them make sense of the mathematical task. “For example, if we focus on a student’s failure to use a technical term, we might miss how a student constructs meaning for mathematical terms or uses multiple resources, such as gestures, objects, or everyday experiences. We might also miss how the student uses important aspects of competent mathematical communication that are beyond a vocabulary list. (p.195)”

The primary advice given by educators is to support mathematical meaning making in multiple ways, be flexible and change the activities, and alter strategies. Many colleagues spoke about computer-based programs used in tandem with instruction when topics include many new ideas. According to Behrend(2003), giving word problems based on familiar contexts and words, allowing students to use their own strategies, explaining it to others and listening to other strategies is effective in supporting making sense of the mathematics. For students who have difficulty remembering procedures, this strategy can help them understand the problem and solve it in a way that makes sense to them based on their understanding of the familiar context. We truly build on students’ experiences as we provide them new opportunities.

Perhaps the most important thing for helping students make sense of mathematics and science is for them to be active. David Rench, a CPS teacher, finds that when students build things--drawing or moving materials– they gain “experience with the word.” Afterwards, students post their work, take ownership, and continually refer to it rather than simply looking up the meaning of words out of context. Grumbine & Alden (2006) suggest that teachers teach and model reading strategies for science textbooks, for example by using graphic organizers to identify main ideas. Students can also review notes by highlighting main ideas and then compare, contrast and discuss highlighted choices in teams.

Furthermore, instruction and assessment approaches can take different forms that capitalize on students' learning strengths such as seeing or performing a demonstration (such as a skit or role play), viewing or constructing a visual representation, creating posters and three dimensional models, or team interviews. For example, in geometry, instead of providing step-by-step instructions, a teacher can create a unit around the word “isosceles” to explore its meaning and visual imagery. Similarly, a teacher may demonstrate and allow students to use a program that illustrates planetary orbit, and include activities for learning words like “orbit” or “gravity” by enacting them or drawing them.

References

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