

Using Mnemonic Instruction to Facilitate Access to the General Education Curriculum

Mnemonic instruction is an instructional strategy commonly used with students who have disabilities as well as with their non-disabled peers. It is designed to improve memory of key information. Mnemonic instruction facilitates access to the general education curriculum by giving students the tools they need to better encode information so that it will be much easier to retrieve it from memory at later points. Mnemonics can be used in language arts (i.e., vocabulary, spelling, and letter recognition), math, science, social studies, foreign language, and other academic subjects. Use of this instructional strategy does not require a wealth of additional materials or extensive planning and preparation time (Mastropieri & Scruggs, 1998).

How Mnemonic Instruction Works

Mnemonics is a memory enhancing instructional strategy that involves teaching students to link new information that is taught to information they already know. According to Levin (1993), mnemonic instruction is useful for students across a wide age range. Though students in the early elementary grades are usually not expected to learn and recall as many facts as older students, they are involved in a number of activities that involve making associations that employ mnemonic principles. For example, associations linking the letter “a” to the word “apple” or “f” to “flower” employ mnemonic principles. Teachers instruct students in the use of mnemonic strategies by using both visual and verbal cues. There are at least three distinct methods for teaching mnemonics: keyword, pegword, and letter strategies. These methods are briefly described below.

Keyword Strategy

The keyword strategy is based on linking new information to keywords that are already encoded to memory. A teacher might teach a new vocabulary word by first identifying a keyword that sounds similar to the word being taught and easily represented by a picture or drawing. Then the teacher generates a picture that connects the word to be learned with its definition. According to Scruggs & Mastropieri (n.d.), the keyword strategy works best when the information to be learned is new to students.

Example

To teach students the definition of the new word, the teacher will ask the students to remember the keyword, envision the picture and how it relates to the definition, and finally recall the definition. If a teacher is trying to teach her students the definition of the old English word **carline**, she will first identify a good keyword. In this instance, “car” is appropriate because it is easy to represent visually and it sounds like the first part of the vocabulary word. **Carline** means “witch” so the teacher shows the students a picture of a car with a witch sitting in it. When asked to recall the definition of **carline**, students engage in a four-step process:



1. Think back to the keyword (car),
2. Think of the picture (a car),
3. Remember what else was happening in the picture (a witch was in the car), and
4. Produce the definition (witch) (Scruggs & Mastropieri, n.d., p. 2).

Pegword Strategy

The pegword strategy uses rhyming words to represent numbers or order. The rhyming words or “peg words” provide visual images that can be associated with facts or events and can help students associate the events with the number that rhymes with the peg word. It has proven useful in teaching students to remember ordered or numbered information (Scruggs & Mastropieri, n.d.). For example, “one” is typically represented by the word pegword “bun,” two is represented by the pegword “shoe,” and “three” is represented by the pegword “tree.” Teachers can use these pegwords to help students remember historical facts.

Example



During a study of the American Revolutionary War, a teacher wanted her students to remember the three major Acts that the British Parliament passed that led to the American Revolutionary War: the Sugar Act of 1764, the Stamp Act (1765), and the Townshend Acts (1767). To help them remember the Acts and the order in which they occurred, she created the following mnemonics: for the Sugar Act of 1764, she created a picture of a bowl of sugar (reminding students of the Sugar

Act of 1764) being poured on a hamburger bun (“bun” is the pegword for “one,” indicating the first Act that Parliament passed). For the Stamp Act, the teacher created a picture of a pair of shoes (“shoe” is the pegword for “two”) with a stamp (to remind students of the Stamp Act) on it. Finally, she created a picture of a teapot with the Union Jack on it (to remind the students of the Boston Tea Party, which resulted from the Townshend Acts) and a tree coming out the top of the teapot (“tree” is the pegword for “three”).

Letter Strategy

Teaching letter strategies involves the use of acronyms and acrostics. Acronyms are words whose individual letters can represent elements in lists of information, such as HOMES to represent the Great Lakes (e.g., Huron, Ontario, Michigan). Acrostics are sentences whose first letters represent to-be-remembered information, such as “My very educated mother just served us nine pizzas,” to remember the nine planets in order (e.g., Mercury, Venus, Earth, Mars). (Scruggs & Mastropieri, n.d.). Teachers can use these letter strategies to help students remember lists of information.

Example A

The mnemonic “IT FITS” (King-Sears, Mercer, & Sindelar, 1992) is an acronym providing the following steps to create mnemonics for vocabulary words:

- I** dentify the term (vocabulary word, e.g., “impecunious”).
- T** ell the definition of the term (e.g., “having no money”).
- Fi** nd a keyword (e.g., “penniless imp”).
- T** hink about the definition as it relates to the keyword, and imagine the definition doing something with the keyword. For example, “an imp tried to buy something but found that his pockets contained no money.”
- S** tudy what you imagined until you know the definition (Foil & Alber, 2002).

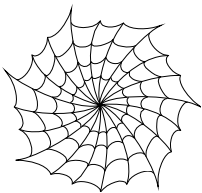
Example B

Another mnemonic device for creating keywords for new vocabulary is LINCS (Ellis, 1992). During a unit on medieval history, students must learn a new vocabulary word, “catapult.” The teacher gives the following instructions:

- L**ist the parts. Write the word on a study card, and list the most important parts of the definition on the back. On the frontside of the card write the word “catapult” as the term to be defined, and on the backside of the card write “to throw or launch as if by an ancient device for hurling missiles.”
- I**magine the picture. Create a mental picture and describe it. For example, something being launched over or through a barrier.
- N**ote a reminding word. Think of a familiar word that sounds like the vocabulary word. For example, a “cat” and a “pole” sounds similar to “pult”—write this on the bottom half of the card).
- C**onstruct a LINCing story. Make up a short story about the meaning of the word that includes the word to be remembered, for example, a cat pole-vaulting over a castle wall.
- S**elf-Test. Test your memory forward to back; for example, look at the word “catapult” and “cat pole” on the front of the card, and say aloud the definition on the back of the card, as well as the image of a cat pole-vaulting over a castle wall. Reverse this process by looking at the back of the card to self-test the vocabulary word and keyword (Foil & Alber, 2002).

How Mnemonics Facilitates Access to the General Education Curriculum

Mnemonic instruction is a strategy that provides a visual or verbal prompt for students who may have difficulty retaining information. In this way, children whose learning modalities are primarily visual or verbal are able to create a picture, word, rhyme, or sentence that is attached to an idea they already have. This strategy enhances access to the general education curriculum by building on what students already know or have experienced.



Mnemonic instruction follows the premise that as children learn, they are building a web of knowledge. Learning something new is like adding a thread to the web. For students with memory challenges or processing disorders, mnemonic devices become the tools to build threads from new to old ideas. Because of their ability to create and retain connections made by their typically developing peers, these students are then able to participate in the same curriculum.

Evidence of Effectiveness

Mnemonic instruction “has been well researched and validated for students with high incidence disabilities, particularly students with learning disabilities, as well as for general education students in elementary and middle school” (DLD/DR Current Practice Alerts, p.1).

According to Swanson (1999) and Forness, Kavale, Blum, and Lloyd (1997), the use of mnemonic strategies have helped students with disabilities significantly improve their academic achievement. Mnemonic strategy was first used in a general education setting by college undergraduates learning foreign language vocabulary (Uberti, Scruggs, & Mastropieri, 2003, in Atkinson, 1975). Later research extended the use of such instruction into classrooms of younger students and among students with learning disabilities. In a recent study, college students used a mnemonic strategy to study and recall painting-to-artist matchings. All four experiments of the study repeatedly showed that those students who used mnemonics substantially outperformed those who did not use them on tests that required recall of artists and their paintings (Carney & Levin,

2000). Two recent studies on using mnemonics for social studies instruction showed not only test improvement among all students but also marked improvement among students with disabilities (Mastropieri, Sweda, & Scruggs, 2000; Uberti, Scruggs, & Mastropieri, 2003).

Mnemonics instruction has also been shown to be an effective strategy for increasing student comprehension test scores. On average, students who have been trained in mnemonic instruction outperform students without training on comprehension exams. It is important to remember that mnemonic instruction is a memory-enhancing strategy and is not designed specifically to enhance comprehension. Researchers suggest that the reason comprehension scores are higher for students using mnemonic strategies is that the strategy increases their ability to recall the factual information needed to answer a topical comprehension question. For example, a student could understand the concept of landforms, yet be unable to remember the names of the oceans and continents. Through the use of mnemonic strategies, it is more likely that the student will be able to remember this factual information, answer the question, and demonstrate comprehension. However, remembering factual information requires that a student understands the concept of landforms. Students who need help understanding the concept will benefit from instruction in comprehension strategies (Mastropieri, Scruggs, & Fulk, 1990; & Scruggs, Mastropieri, McLoone, Levin, & Morrison, 1987).

Caution should be used when teaching mnemonic strategies. Students who may benefit from the use of mnemonic instruction may not be able to construct their own mnemonics effectively. For example, in one study mnemonic instruction was used to teach general education middle school students about 18th, 19th, and 20th century inventions and their corresponding dates. This study found that the students had difficulty using mnemonic strategies independently; that is, they were unable to effectively apply them and create mnemonics on their own (Hwang & Levin, 2002). Thus, keyword mnemonics can either be provided by the teacher or created by the student. However, it may be more effective for the teacher to provide the keyword mnemonics to the students (King-Sears et al., 1992; Scruggs & Mastropieri, 1992).

Conclusion

Teachers and administrators should consider mnemonic instruction a useful tool on a continuum of strategies that require varying levels of teacher involvement and student independence. Mnemonic instruction is an inexpensive strategy that provides a means of helping children with disabilities gain access to the general education curriculum. No specific level of teaching experience is required to learn or use this strategy. Furthermore, mnemonic instruction involves no additional costs for purchase of materials or technology.

Mnemonics can be teacher created or student created. However, the teacher should introduce and create mnemonics until students learn how to properly use them. Students should be allowed to create their own mnemonics when they are not only comfortable using them but also willing to create mnemonics with appropriate and correct information.

This strategy is a “low-tech” approach that has shown most promise for learners with mild to moderate cognitive disabilities or for those who have “high incidence” disabilities (including but not limited to learners who have learning disabilities, ADD, or ADHD). Because this strategy requires some previous knowledge and the ability to make connections between knowledge, it may not work as effectively for children with more severe cognitive delays.

Learn More about Mnemonic Instruction

The Virginia Council for Learning Disabilities also provides information from Mastropieri and Scruggs at http://www.vclld.org/pages/newsletters/00_01_fall/mnemonic.htm. This reference provides information regarding each of the three methods mentioned in this document, as well as information regarding general techniques, training for independent use, and limitations.

The Center for Research on Learning at the University of Kansas provides a quick one-page, on-line reference that demonstrates word-based devices and combined mnemonic devices. Illustrations provide examples for clearer understanding. This page is available at http://itc.gsu.edu/academymodules/a304/support/xpages/a304b0_20600.html.

Members of the Division for Learning Disabilities (DLD) of the Council for Exceptional Children can access a free on-line tutorial on mnemonics. This is available through the DLD Web site at www.teachingld.org.

The National Center on Accessing Curriculum publishes two information briefs, *Teaching Sounds, Letters, and Letter-Sound Correspondences* and *These Methods Suggest A New Pedagogy For Literacy Development*, which demonstrate how mnemonics are used in the classroom. They are at <http://www.cast.org/>.

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This report was produced under U.S. Department of Education Grant # H326K020003 with the American Institutes for Research. Jane Hauser served as the project officer. The views expressed herein do not necessarily represent the positions or policies of the Department of Education. No official endorsement by the U.S. Department of Education of any product, commodity, service or enterprise mentioned in this publication is intended or should be inferred.