Research Based Strategies for the Classroom Part # 2

Identifying Similarities and Differences

According to the Northwest Regional Educational Laboratory (2010), seeing similarities and differences is a fundamental cognitive process (Gentner & Markman, 1994; Medin, Goldstone, & Markman, 1995). As an instructional strategy, it includes various activities that help learners see patterns and make connections. For example, students compare things that are similar and contrast things that express differences. They classify when they identify features or characteristics of a group of objects or ideas, and then develop a scheme to organize those objects. Metaphors are created when two ideas or experiences are compared based on a common underlying structure. Finally, analogies provide another way to identify similarities and make comparisons.

Each approach helps the brain process new information, recall it, and learn by overlaying a known pattern onto an unknown one to find similarities and differences. Looking for similarities and differences prompts the learner to consider, "What do I already know that will help me learn this new idea? This fosters relationships and connections to new understanding.

Key Research Findings

- Cognitive research shows that educational programs should challenge students to link, connect, and integrate ideas (Bransford, Brown, & Cocking, 1999).
- Results of employing these strategies can help to boost student achievement from 31 to 46 percentile points (Stone, 1983; Stahl & Fairbanks, 1986; Ross, 1988).
- In young adults, having a relatively long time perspective has been associated with a more abstract, holistic approach to cognitive tasks, as opposed to the more concrete, detailed approach associated with having a more limited or near-future focus (Thomas, Kim, Goldstein, Hasher, Wong and Ghai, 2007)
- Students benefit by having similarities and differences pointed out by the teacher in an explicit manner. This can include rich discussion and inquiry, but allows students to focus on the relationship or bridge to the new ideas (Chen, Yanowitz & Daehler, 1996; Gholson, Smither, Buhrman, & Duncan, 1997; Newby, Ertmer, & Stepich, 1995; Solomon, 1995).
- Students also benefit by being asked to construct their own strategies for comparing similarities and differences (Chen, 1996; Flick, 1992; Mason, 1994, 1995; Mason & Sorzio, 1996).
- Combining this strategy with the method of using nonlinguistic representation enhances student achievement significantly (Chen, 1999; Cole & McLeod, 1999; Glynn & Takahashi, 1998; Lin, 1996).

Implementation

Students benefit by direct instruction and open-ended experiences in identifying similarities and differences. Teachers can increase learning potential with research-based strategies, such as:

1.) Point out similarities and differences. Present students with similarities and differences explicitly when this helps them reach a learning goal. As a result of the teacher's instruction, students recognize similarities and differences in order to understand something specific.
2.) Allow students to explore similarities and differences on their own. When the learning goal is to engage students in divergent thinking, ask them to identify similarities and differences on their own.
3.) Have students create graphic organizers. Help students to create or use graphic or symbolic representations of similarities and differences, classification systems, comparisons, and analogies. Suggestions include Venn diagrams, comparison tables or charts, hierarchical taxonomies, and linked maps.
4.) Teach students to recognize the different forms. Help students recognize when they are classifying, comparing, or creating analogies or metaphors.
5.) Recognize that All the World's a Stage. Language is rich with metaphor. As students encounter metaphors in reading or speaking, generate a class list. Metaphors provide a source of history, generate literary references, and suggest new ways for students to express ideas.
6.) McDaniels (Bright Hub, 2008) suggests the following techniques to teach similarities and differences:

- **Analogies**: Analogies are a fun, efficient and effective means of teaching about similarities and differences. Start by introducing the compare/contrast text structure. This can be a springboard for analyzing similarities and differences in a variety of contexts across the curriculum. Start using analogies to analyze and experiment with word relationships as part of a game or other enjoyable activity.
- **Multisensory Activities**: One effective multisensory activity for teaching about similarities and differences is having students work in teams to analyze, evaluate, compare and contrast a plain donut with a plain bagel to decide which food would be healthier to eat.
- **Provide Graphic Organizers**: Give students opportunities to practice classifying, categorizing and comparing things and ideas. Increase the rigor by including activities that involve generating, analyzing and comparing metaphors, similes and analogies.

Additional Resources

The Private Eye is a resource for teaching students how to use metaphor, and compare and contrast, through the use of jeweler's loupes and focused questioning. http://www.the-private-eye.com

The **Sourcebook for Teaching Science** provides an online guide for how to teach science through the use of analogies. http://www.csun.edu/~vceed002/ref/analogy/analogy.htm

Teaching Science Concepts to Children: The Role of Analogies is a Web site dedicated to improving science education provided by the College of Education, University of Georgia. http://www.coe.uga.edu/edpsych/faculty/glynn/twa.html

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