

**Advance organizers: Activating and Building Schema for more  
Successful learning in students with disabilities**

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November 30, 2005

## **Advance Organizers: Activating and Building Schema for More Successful Learning in Students with Disabilities**

In the 1960s, cognitive psychology initiated work on the development of an invaluable tool that enabled educators to provide students with meaningful learning, instead of relying only on rote learning for memorization tasks (Ausubel, 1960; Ausubel, 1978; Ivie, 1998). Cognitive psychologists believed that all of a person's prior knowledge was stored in the cognitive structures of the brain. Therefore, in order for acquisition of new knowledge to take place and to be meaningful, prior knowledge or schema needed to be activated within these structures by means of an introductory instructional strategy (Ausubel, 1978; Ivie, 1998; Joyce & Weil 1986; Kalmes, 2005; Postrech, 2002). Thus, Ausubel (1960) developed the new strategy that he termed advance organizers. Advance organizers have evolved since that time to incorporate many forms. Also, further scientific research in the field of advance organizers has shown that they are effective tools when teaching students with disabilities. By stimulating schema to enable students to link prior knowledge with new concepts, advance organizers provide a kind of "mental scaffolding to learn new information" (Hassard, 2005, p. 1). Thus, the new information is easier to understand, learn, retain, and recall (Ausubel, 1960).

The purpose of this paper is to explore advance organizers and their use as tools to activate and build schema when students with disabilities are presented with new concepts in the classroom. This will be done by first giving a brief synopsis of the

inception of advance organizers and their connection to schema theory. Next, various types of organizers and their uses will be offered to enable teachers to determine the best organizers to use for their individual students and the type of content being presented. Then, because it is important for the teachers to make selections of organizers for their students and course content based on scientifically-based research, an overview of the literature and research on advance organizers will be discussed. Finally, a discussion that reviews the implications for teachers will ensue.

### **Background**

David Ausubel is generally credited with the invention of the advance organizer in 1960. In his research to promote meaningful learning over rote learning, he formulated his subsumption theory. Working from the premise of his subsumption theory, which stresses meaningful learning by linking the prior knowledge of students with new information that is presented in the school setting, Ausubel (1960) determined through extensive research that “the most dependable way of facilitating retention is to introduce the appropriate subsumers and make them part of cognitive structure prior to the actual presentation of the learning task. The introduced subsumers thus become advance organizers or anchoring foci for the reception of new material” (Ausubel, 1960, p. 270). When conceived by Ausubel, he intended advance organizers for all learners. However, he later determined that the “ideational scaffolding” technique worked best as a recall strategy for poor comprehenders (Ausubel, 1978). He recognized the unique needs of all

individuals when constructing advance organizers; stating that the construction of an organizer depended “on the nature of the learning material, the age of the learner, and his degree of prior familiarity with the learning passage” (Ausubel, 1978, p. 251).

Ausubel’s subsumption theory is linked very closely to schema theory. When explaining the role of schema theory in relation to students’ comprehension and memory, Anderson (2004) explains a student uses prior knowledge of objects and events to make sense of concepts presented in new material and, then, recalls that information. These processes are so natural that normal functioning readers are not aware that it is occurring (Anderson, 2004). Since some students come to the table with little or no prior knowledge about a subject, they may not comprehend specific information or may interpret it differently, depending on the schemata that they have developed about a particular subject. Presentation of the materials may require some simplification or, in some instances, elaborations to best activate schemata and aid recall. Both Bransford (2004) and Anderson (2004) agree with Ausubel that advance organizers are an excellent way to activate and build schema prior to the actual learning of new material by students with disabilities.

### **Types and Uses of Organizers**

As long as advance organizers do their job of introducing new learning concepts and linking or developing new schema to relate the material to, they can take many shapes including a simple oral introduction by the teacher, student discussion, outlines,

timelines, charts, diagrams, and concept maps (Anderson, Yilmaz, & Wasburn-Moses, 2004; Baxendell, 2003; Bransford, 2004; Bundy, 2005; Caverly, 1997; Jones, 2003; Mosco, 2005; Paik, 2003; Story, 1998). Advance organizers that build schema by providing new information are called expository organizers. When the advance organizers help students to recall prior knowledge by activating existing schema, they are called comparative organizers (Bajt, 2004; Bundy, 2005; Kalmes, 2005).

Caverly (1997) suggests the use of several types of advance organizers that can be used by students with disabilities for new exposure to both expository and narrative text. “The KWL (What I Know, What I want to know, and What I learned) strategy” (Glazer, 1999, p. 106) offers pre-reading exercises that activate background knowledge and provides the student with reading purpose by using a diagram of sorts. This organizer can actually be used for pre-, during-, and post-reading of any content text so students can monitor their progress by self-questioning. First and second degree MURDER [mood, understand, recall, detect, elaborate, and review] are suggested as optimal strategies for disabled readers. First degree MURDER uses “general and specific textbook study tactics” (Caverly, 1997 p. 36). Like KWL, second degree MURDER allows students to set a purpose and to monitor their own progress. The strategy that Caverly finds most appealing is PLAN. Once again, this strategy offers pre-, during-, and post-reading tactics. The steps are:

P--Predict by previewing the text and creating a concept map. A tree trunk with

extending branches is recommended.

L--Locating prior background knowledge on the map with checks and new concepts with question marks.

A--Add new branches to the map to represent new knowledge acquired during reading. Verify, modify, and add to prior knowledge. Confirm the new concepts with question marks.

N--Note after reading if “the macrostructure of the material is indeed what they predicted prior to reading (i.e., typically they predict a categorization pattern). If the structure is different, they construct a new map to better represent the author’s rhetorical structure” (Caverly, 1997 p. 36-37).

A variation of this strategy is PLANet. In this version, unknown vocabulary that is thought to have significance is marked with double question marks. The students are then taught to research the words on the Web to link with existing schema or build new schema which quickly develops the vocabulary of students with disabilities (Caverly, 1997). As Caverly (1997, p. 29) noted: “Naively, developmental students [those below grade level in reading ] assume that if they could pronounce all the words (decoding) or if they only knew all the words (vocabulary density), understanding would come.”

Previewing vocabulary for the text with an advance organizer allows students to become familiar with difficult words before they are encountered and allows them to simulate prior knowledge through word associations that will help to present new concepts

(Barron, 1969).

According to Bulgren (Walther-Thomas & Brownell, 2000), Concept Enhancement routines, such as Concept Diagrams and Concept Mastery Routines or Comparison Tables and Comparison Table Routines, that use advance organizers to introduce new material to students with disabilities provide positive responses. Also, Bulgren (Walther-Thomas & Brownell, 2000) supports Anderson (2004) and Bransford (2004) in the claim that most content text is not organized in a manner that supports learning in students with disabilities. Like the Schema Theory researchers, she sees the need for teachers to use organizers to supplement the text for maximum response from learners with disabilities (Anderson, 2004; Bransford, 2004; Walther-Thomas & Brownell, 2000). Organizers like those used in the Concept Anchoring Routine help students to organize new content information and focus on new concepts while relating the new material to previous knowledge of a similar concept (Walther-Thomas & Brownell, 2000).

Concept webbing or mapping is similar to Bulgren's Concept Enhancements, but more pictorial in nature. It uses a hierarchical, visual display of various graphs to map out the main concept and the supporting material. Students with disabilities who use graphic representations as advance organizers perform better on tests, due in part to the way the organizers provide retention, recall, and scaffolding of new ideas and concepts with preexisting schemata (Robinson, 1998). In addition, the visual organization

increases the students' understanding by providing a skeletal map that increases the students' ability to link new concepts with prior knowledge; therefore, increasing retention and recall (Dye, 2000; Hassard, 2005; Mosco, 2005).

Atherton (2005) suggests that advance organizers can also be used as note-taking devices. He suggests gapped handouts, which leave blanks for students to fill in as the teacher provides instruction. The teacher can choose to leave large spaces for note-taking or simple blanks where keywords can be placed. Gapped handouts can also take the form of concept webs, charts, and tables. Later, these handouts can be used as study guides for tests (Atherton, 2005).

Another simple activity that can be considered an advance organizer and can be used to aid in schema activation and building for students with disabilities is discussion. Discussion is vital at all stages of the learning process, but at the early stage, teacher led discussion is integral in activating prior knowledge and building new schema to relate to topics to be presented (Alvarez & Risko, 1989; Eisenwine, 2000; Lloyd, 1996). Simply asking students questions about experiences that they have had can be used to relate prior knowledge to the new concepts in the upcoming material (Bransford, 2004). "Tell me what you know about..." is an excellent lead into a discussion that will activate existing schema (Carr & Thompson, 1996). Eisenwine (2000) suggests first letting the students look through the book to allow them to gather information for questions and discussion. After the previewing, the teacher would then ask questions specific to the new material

that would allow for activation and building of schema necessary for understanding of the concepts. Referring to previous lessons, asking students to share personal experiences and knowledge with the class, teachers sharing their personal experiences and knowledge with the students, and teachers giving students the information necessary to understand the new concepts by way of direct instruction are some of the ways that Lloyd (1996) suggests to stimulate discussions to activate prior knowledge. When a teacher uses a simple introduction, such as “Today, we are going to learn about how weather works and how it affects each of us,” it begins to activate students’ schemata on weather and can also generate student discussion that will build schema (Atherton, 2005). Discussion during and prior to learning new material continues to clarify schema for students (Story, 1998). Sipe (2001) states that “talk, situated in particular social contexts, is considered an important tool for children to construct their own formulation of concepts and to generalize from specific cases with the help of more able peers and adults” (p. 336).

All of the specific advance organizers mentioned, as well as variations not described such as Venn diagrams and Four quadrants (Jones, 2003), share the purpose of activating and building schema to enable students with disabilities to be more active learners. The type of material being addressed and the type of learners the organizers are to be used with will determine the type of organizer used in learning new material (Kiewra, Mayer, Dubois, Christensen, Kim & Rish, 1997; Story, 1998). Also, considering the individual learners’ prior knowledge should be at the forefront of the

teacher's instructional plan (Ausubel, 1978; Story, 1998). Researchers have proven the effectiveness of the above mentioned organizers on instruction and continue to provide additional studies on the effects of these and other organizers. To better understand the way advance organizers work and their effects on students with disabilities, it is advantageous for educators to look at the research.

### **Overview of Research on Advance Organizers**

Research on advance organizers and their effects on learning, retention, and recall of new material began with Ausubel (1960) and continue through the present. Ausubel's studies began with undergraduate students at the University of Illinois, where he determined that the introduction of unfamiliar material [e.g., "the metallurgical properties of plain carbon steel" (p.267)] was better learned and retained when the treatment groups received various types of advance organizers. Additional research has shown that although advance organizers work well for all students when there is no prior knowledge of new material, their value declines for students without disabilities who possess prior knowledge (Ausubel, 1978; Bajt, 2004). However, Fisher, Schumaker, and Deshler (1995) feel that even when prior knowledge is present, visually graphic advance organizers can be a benefit to all students in an inclusive classroom, especially those with organizational difficulties.

For the best results when using advance organizers, they should be "consistent, coherent, and creative" (Baxendell, 2003, p. 46). Boyle and Yeager (1997) feel that

advance organizers should be straightforward to provide the most effectiveness and clarity. If the organizer is not easily understood, the effectiveness will be lost. Since the organizers' main purpose is to provide clarity and understanding of new concepts, it is best if they are "free of distracting information or visuals" (Baxendell, 2003, p. 47). Otherwise, students may be more confused or disorganized than they would have been originally (Robinson, 1998). This is not to say that creativity should be sacrificed. Students can illustrate their own organizers with relevant pictures to aid in remembering the information. Also, educators should creatively introduce the organizers to keep them fresh and exciting. In addition, clearly labeling key concepts and listing hierarchical information helps students to organize their thoughts and internalize the new concepts, while activating prior knowledge (Baxendell, 2003).

Since the storing of schemata involves cognitive structures of the brain and Ausubel (1960; 1978) proposes that advance organizers help to retrieve the stored schemata, researchers have looked at the cognitive structure of learning to ascertain whether or not advance organizers do promote learning, retention, and recall in students with disabilities (Ausubel, 1978; Baxendell, 2003; Ivie, 1998; Kiewra et al., 1997; Walther-Thomas & Brownell, 2000). According to Baxendell (2003), recent research shows that when instruction first introduces new material with advance organizers, it is effective in the retention and recall of students with disabilities. Bulgren (Walther-Thomas & Brownell, 2000) states that studies have shown that students with disabilities

“have difficulty identifying on what is truly important content ...[and] may not have well-developed thinking skills that allow them to manipulate content information dealing with relationships such as compare-and-contrast relationships effectively” (pp. 232-233).

Advance organizers enable these students to concentrate on the important concepts and provide a way of thinking that allows them to get the most out of the content, while developing their higher level thinking abilities. In turn, the students are better able to perform on tests that require them to recall information that they have learned (Story, 1998; Walther-Thomas & Brownell, 2000). According to Story (1998), studies by Luiten, Ames, and Ackerson in 1980 and Stone in 1984, in addition to numerous other studies conducted between 1984 and 1992, showed that learning and retention were positively affected by advance organizers in all content areas across various age, grade, and performance levels.

Advance organizers’ effects on recall, especially in regards to testing, have also been the object of much research. In the study by Kiewra et al. (1997), the researchers examined the effects of conventional, linear, and matrix advance organizers. All organizers had a “test-appropriate” effect on recall. However, once again, depending on the information being learned, they found that some types of advance organizers worked better than others. Story (1998) noted that studies by Herron in 1992, 1994, and 1995 also confirm that the structure of the organizer needs to comply with the subject matter being taught, but that all organizers improved the recall of students using the organizers (Story,

1998). In addition, Story (1998) cites a series of additional research studies that yielded similar results, where students using advance organizers scored higher on tests than control groups not using advance organizers. Finally, Anderson et al. (2004) cited research reported by Bulgren, Schumaker, and Deshler in 1988, Doyle in 1999, and DiCecco and Gleason in 2002 that collectively showed a marked improvement in test scores by students with learning disabilities when new concepts were introduced with advance organizers.

As with any theory or method, there are critics and researchers that feel advance organizers have little or no effect on learning, retention, and/or recall. In the 1995 study by Kirkland, Byrom, MacDougall, and Corcoran, students who were non-disabled showed no effects on their comprehension when provided with advance organizers that used captioning and discussion as an introduction to presentations offered via television and video. However, there was an improvement in comprehension when the same study was done with students with learning disabilities. A similar study by Saidi (1993, as cited by Story, 1998) produced the same results. Ausubel (1978) cites a 1970 criticism of Peeck that advance organizers “are too time-consuming to be efficient adjunct aids and that, therefore, the time spent on them would be just as well or better spent studying the learning passage itself” (p. 253). This and other criticisms prior to 1978 have been dismissed by Ausubel as misinterpretations of data of his studies and “failure to adhere to the explicit operational criteria of what an organizer is, and in part to various

methodological deficiencies in research design” (p. 255), when attempting to replicate his studies. The largest factor for negative response to advance organizers comes from research that is conducted with students who are non-disabled that have some prior knowledge of the new content material. As previously stated, when these variables are present, the positive effects of advance organizers on learning, retention, and recall are diminished (Ausubel, 1978; Baxendell, 2003, Bajt, 2004; Story, 1998). However, upon reviewing the research with direct regards to students with disabilities, the overwhelming consensus among researchers is that advance organizers combined with other instructional strategies is extremely effective in promoting learning, retention, and recall.

### **Discussion**

An overview of the literature about advance organizers holds several implications for teachers. First, keeping in mind that advance organizers are instructional strategies to activate and build schema in a cognitive learning structure, it is vitally important for teachers to consider advance organizers as a tool to preview a lesson, not as the sole means of instruction (Bundy, 2005; Jones, 2003; Postrech, 2002). Based on the initial response to the material presented in the organizer, teachers can modify their lesson plans and materials to better fit the prior knowledge of their students. They can also more efficiently structure their time and the critical points that need to be covered, while simplifying complicated text (Anderson, 2004; Ausubel, 1978; Bransford, 2004; Jones, 2003; Walther-Thomas & Brownell, 2000). This enhances the development of higher

order thinking in the students by helping them to relate concepts previously learned to the new material and enabling them to quickly organize their thoughts (Paik, 2003). Joyce and Weil (1986) offer teachers a three phase Advance Organizer Model of Teaching that includes “the presentation of the advance organizer, the presentation of the learning task or material, and the strengthening of cognitive organization” (p. 255) (Table 1).

Following this basic procedure in a structured teaching environment should enable students to get the most from advance organizers (Bundy, 2005; Kalmes, 2005).

Also, the move towards inclusion calls for special education teachers to arm themselves with tools that are born out of scientifically-based research. With the diversity that exists in classrooms today, teachers need to realize the pressures on the students with disabilities to perform at an acceptable level while learning the same strict, standards-based curriculum content as the students who are non-disabled. Advance organizers are research-based tools that will help to level the playing field, while in varying degrees aiding all students in inclusive classrooms (Baxendell, 2003; Walther-Thomas & Brownell, 2000). Box and Little (2003) maintain that self-confidence and an improved self-concept are added results from the use of advance organizers in a cooperative learning setting that can aid students with disabilities with success in an inclusive setting.

In addition, research on advance organizers provides teachers with the tools they need to determine how their students learn. Emphasis is placed on knowing individual

students and their backgrounds and abilities so that teachers can best determine the type of organizers that will best foster learning, retention, and recall for the subject content that will be presented to their students (Jones, 2003). With a plethora of organizer types available, teachers should study the research on advance organizers as well to know what works best in a particular area, while keeping in mind that a large number of researchers agree that advance organizers with a visual format appear to be of particular value to the learning process of students with disabilities (Anderson et al., 2004; Mosco, 2005; Story, 1998; Walther-Thomas & Brownell, 2000).

In conclusion, it is good for students to realize that they need to acquire additional information to understand and remember. In this way, students learn how to search for their own elaborations. Also, this enables the student to learn about themselves as learners. When considering less successful learners, teachers should keep in mind that many of these students are not aware of what factors make things easy or difficult to comprehend or recall. Teaching students with disabilities to employ strategies such as advance organizers that activate and build schema will give way to improved learning, retention, and recall.

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**Table 1:**

**Advance Organizer Model of Teaching**

Phase One: Presentation of Advance Organizer

- \* Clarify aims of the lesson
- \* Present organizer:
  - Identify defining attributes.
  - Give examples or illustrations where appropriate.
  - Provide context.
  - Repeat.
  - Prompt awareness of learner's relevant knowledge and experience.

Phase Two: Presentation of Learning Task or Material

- \* Present material.
- \* Make logical order of learning material explicit.
- \* Link material to organizer.

Phase Three: Strengthening Cognitive Organization

- \* Use principles of integrative reconciliation.
- \* Elicit critical approach to subject matter.
- \* Clarify ideas.
- \* Apply ideas actively (such as by testing them).

Source: Joyce & Weil (1986, pp. 273-278)