TeacherVision

An explanation of symbolic vs. nonsymbolic information in regards to teaching inclusively.

Symbolic and Nonsymbolic Information

Symbolic information is needed for cognitive tasks. Nonsymbolic information is needed for motor tasks. Almost all learning and curricula (e.g, reading, mathematics, social studies, science) require students to manipulate, acquire, retain, transform, and recall symbolic information. In contrast, nonsymbolic information requires them to learn physical or motor tasks, such as picking up a pencil, shooting a basketball, or running and jumping.

By initially designing symbolic tasks in ways that make the component skills more overt, a teacher can better gauge whether students are learning the tasks and can then provide them with immediate practice and feedback on their developing skills (Kame'enui & Simmons, 1990).

For example, we can simplify the complex task of beginning reading in an alphabetic writing system by:

1. Providing students with a clear model of the speech sounds for each letter of the alphabet.
2. Requiring students to say the sounds of each letter in simple word types such as *sat*, *ran*, and *tot*.
3. Having students "sound out" or decode the words.
4. Then having them read each word the "fast way."

Symbolic vs. Nonsymbolic Information[1]

Symbolic Information Example: Reading the word CUP	**Nonsymbolic Information Example: Picking up a cup**
1. Learning processes are covert and cannot be seen (e.g., silently reading a page of the textbook). Only final outcomes can be observed.	1. Learning processes are overt and can be seen.
The phonological, linguistic, and cognitive processes implicated in reading the word CUP *are not readily observable.*	*The steps in picking up a cup are public and can be observed. It is not possible to pick up a cup without observing the entire act or physical process.*
2. Skills related to a task are sometimes difficult to identify and demonstrate.	2. Skills related to a task are easy to identify and demonstrate.
The skills implied by the act of reading may vary greatly, depending on a student's cognitive abilitiesand perspective about reading in an alphabetic writing system.	*The steps in picking up a cup follow a particular sequence and involve a limited set of physical acts (e.g., gripping the cup, holding it tightly, picking it up, etc.).*

3. Feedback is not obvious in the execution of the task.	3. Feedback is instantaneous and obvious in the execution of the task.
A beginning reader must get feedback from the teacher or other individuals to tell whether his or he, comprehension is accurate.	*To see whether a learner has picked up the cup correctly, one needs only to observe the action and the final response.*

1. The above table identifies three critical differences between symbolic and nonsymbolic information (Kame'enui & Simmons, 1990). The first two component parts of physical tasks (i.e., the learning processes and the demonstrable skills) are always public, observable, and easier to identify than those of symbolic tasks, and the third component (i.e., feedback) is more immediate and transparent than is feedback on a symbolic task.

This process relates the symbolic information (i.e, students learning to understand what they are reading) to nonsymbolic, physical skills (i.e., students verbally demonstrating what they are learning). Curriculum design is the behind-the-scenes activity that appears as the sequence of objectives, schedule of tasks, components of instructional strategies, amount and kind of review, number of examples, amount of teacher direction, and support explicated in teachers' guides and lesson plans. It is the blueprint for instruction.

As such, it can hold significant potential for teaching students with diverse learning needs. Conversely, if the blueprint is too general or vague, it can provide little instructional specification or an inadequate foundation on which students are to build further skills and future learning success.

* Excerpted from *Toward Successful Inclusion of Students with Disabilities: The Architecture of Instruction*(1999) by Edward J. Kame'enui, and Deborah Simmons.