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NONLINGUISTIC REPRESENTATIONS

Knowledge is stored in two ways: linguistically and nonlinguistically. Teachers mainly present new knowledge linguistically in the classroom, as they often ask students to listen to or read new information. Think of knowledge presented linguistically as actual sentences stored in long-term memory. Knowledge that is presented nonlinguistically is stored in the form of mental pictures or physical sensations such as sight, sound, smell, touch, taste, and movement. Using both linguistic and nonlinguistic methods of learning helps students recall and think about information. Because ELLs cannot rely solely on linguistic ability to learn and retain knowledge in a new language, nonlinguistic methods of learning are particularly important for them.

Using modes other than the English language to communicate has long been a mainstay in the tool kit of ESL teachers. To make English instruction as understandable as possible for ELLs, Short (1991) recommends using diverse media, including realia (real objects), graphs, photos, maps, and demonstrations. Short makes these suggestions for mainstream teachers (1991, p. 8):

- **Bring realia into the lessons.** Nonverbal information can be communicated by using real objects and visuals such as photographs, graphs, and charts.

- **Conduct demonstrations.** Match actions with your words to convey meaning. Give directions by pointing, gesturing, showing, and explaining.
- **Use filmstrips, films, videotapes, and audiocassettes with books.** Words alone on a page will not hold meaning for students in the early stages of language acquisition. Students can connect with content better when they see *and* hear it.
- **Have the students do hands-on activities.** Conducting science experiments, performing pantomime, drawing pictures, and sequencing stories are all useful hands-on activities.

Meaning cannot be conveyed to ELLs through words alone. Their instruction must be supplemented with real objects, visuals, body language, facial expressions, gestures, and hands-on experiences.

Generalizations from *Classroom Instruction That Works*

Two generalizations about nonlinguistic representations can be drawn from *Classroom Instruction That Works*.

1. **A variety of activities can help students to formulate nonlinguistic representations.** These strategies include the use of graphic representations, pictures, mental images, physical and technological models, and kinesthetic (movement) activities.
2. **Nonlinguistic representations elaborate on knowledge.** For example, ELLs can add to their knowledge when asked to construct a mental model of a fraction in concrete form (e.g., a pizza sliced in different quantities). Further elaboration takes place when the student explains how the model represents fractions. Preproduction and Early Production students will do better with constructing a physical representation than with explaining it in spoken or written language. Students in the other, higher stages of language acquisition should be able to construct a model as well as to verbally explain it.

Classroom Recommendations

Classroom Instruction That Works offers five recommendations for using nonlinguistic representations in the classroom.

We do current events each morning—that's an Arizona state standard for public speaking. Two or three students a day need to present their current event. The students who are listening draw their nonlinguistic representations, either on the subject of the event or [of two or three] specific vocabulary [words] that I'll write on the chalkboard. . . . The students either draw a picture or engage in an artistic endeavor.

—William Gibson,
Kayenta Intermediate School,
Kayenta, Arizona

1. Use graphic organizers to represent knowledge. Graphic organizers, which include Venn diagrams, charts, webs, and time lines, can be designed to make complex content more understandable for ELLs. Textbooks can often be too complicated for these students. Graphic organizers help them understand knowledge and store it in another way. There are five commonly used types of graphic organizers (see Appendix A): vocabulary terms and phrases, time sequence, cause/effect sequence, episodes, and generalizations/principles.

Do not, however, automatically assume that your students know how to use graphic organizers. A study by Tang (1994) found that intermediate social studies textbooks in Hong Kong, Japan, and Mexico contain few graphic organizers, meaning you will need to model their use for ELLs from those countries and possibly others.

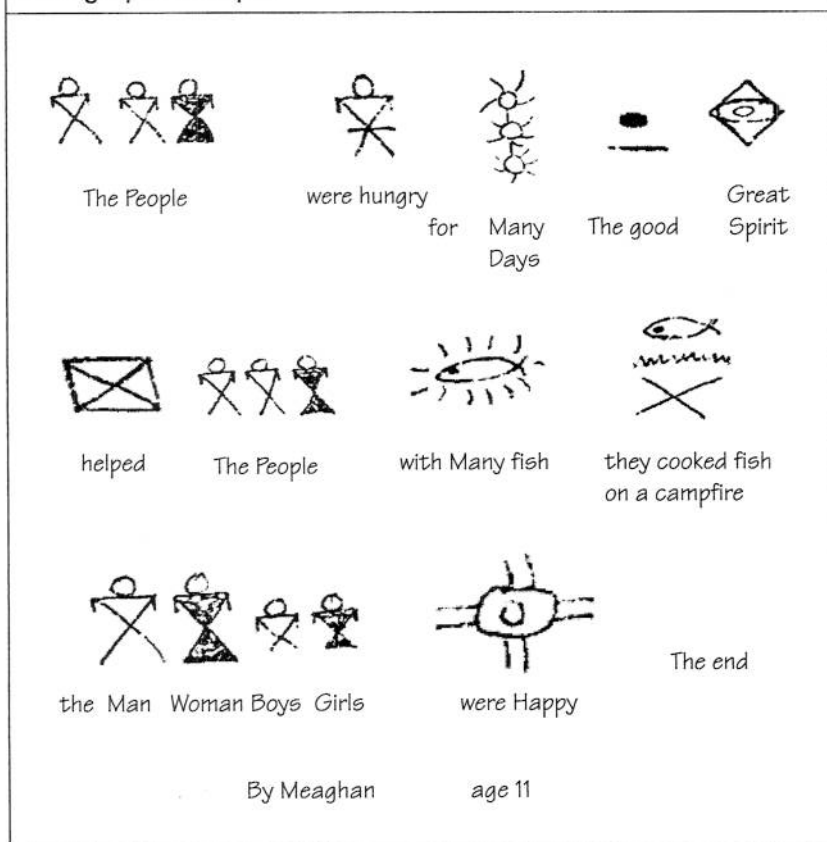
2. Use symbolic representations, such as pictures, pictographs, maps, and diagrams. In order for ELLs to understand text, they must make connections between what they already know and the new information presented. As they make these connections, they construct meaning and begin to comprehend the material. Figures 4.1 and 4.2 are examples of pictographs, which help students visualize information, recognize patterns, and remember new content, such as vocabulary.

Because ELLs enter the U.S. school system with background knowledge in their primary language, pictures and pictographs related to this knowledge can help bridge the language gap. (Tang's 1994 study found that most of the illustrations in Chinese, Japanese, and Mexican intermediate social studies textbooks were representational pictures—common, everyday photographs and drawings of how things look.)

3. Teachers should help students generate mental pictures.

When ELLs listen or read, creating a "movie in the mind" helps them to understand and store knowledge. Using all five senses can help produce rich mental images. For example, when studying the Ming dynasty, a teacher asked her class to close their eyes and relate what they heard when she said the words "Ming dynasty." Responses included "Ping" and "Chinese music." Next, the teacher asked what they smelled. Students described such aromas as "old and mildewy," "musty," and "Chinese food." When asked what they felt, student responses included "cold like a vase" and "spicy." Finally, when the teacher asked what they saw, the students produced many images, including "an antique vase" and "an emperor in a beautiful robe."

Figure 4.1
Pictograph Example



We do lots of pictures with our spelling words. With generating mental pictures, I ask [students] to close their eyes or put their heads down, and I ask them to picture what we are talking about or what they are going to do before they meet with their partners. They really learn best by doing it—by touching it, by acting it out. Especially in 2nd grade, those students who are in their first year in a U.S. school are bombarded with a million vocabulary words—not just the specific vocabulary that I pick out but also the social vocabulary, the academic vocabulary, and then the vocabulary we are setting aside for the students who already speak English. So, it's a lot to take in.

—Lindsay Moses,
North Elementary School,
Brighton, Colorado

4. Make physical models. Physical models are concrete representations of what is being learned. When students use manipulatives, they are making a physical model to represent knowledge. Manipulatives are commonly associated with math (e.g., shapes, cubes, money) but can actually be incorporated in all content areas through such items as puzzles, maps, word sorts, and Legos. For example, instead of labeling the 50 states, assembling a puzzle made up of pieces representing each state would be a good way to use a physical model during a geography lesson.

Any three-dimensional form can be a physical model. For ELLs, the very act of constructing a concrete representation establishes an “image” of the knowledge, so they do not have to depend solely on words.

5. Engage students in kinesthetic activities in which they represent knowledge using physical movement. Total Physical Response (TPR) has been a popular ESL approach over the years. Developed by

I use mental pictures. I have [students] draw out what they think it might be or create a picture in their head. For example, we were talking today about the rain forest, so one of the girls came up and said, "I have a mental picture of Miss Hitchcock wearing brown shorts and a vest and safari hat. I see her in the jungle." I think these mental pictures help a lot because [students] can refer back to that image.

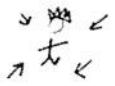
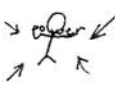



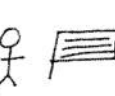


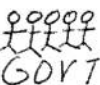
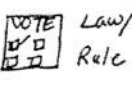






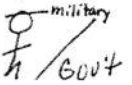
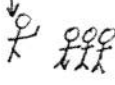


—Denise Hitchcock,
North Elementary School,
Brighton, Colorado

We do the movement thing, too. If somebody were to come in who doesn't really know anything about teaching, they would think some of the things we do are really dorky. For example, when we are studying condensation and precipitation, we all dance around the room—we are clouds, and it's raining. If somebody else were to walk in, they would think, "This is not education. Why are the kids dancing?" And when they are doing the grids, learning how to do the x-axis first, then we always make the letter L using their index finger and thumb. You will see them taking their math test and holding up a hand with index finger and thumb in the L position.

—Elisabeth Berry,
North Elementary School,
Brighton, Colorado

Figure 4.2

Pictograph Example: Vocabulary Terms

absolute monarchy 	dictatorship 	sage 	shroud 
aristocracy 	nationalism 	guile 	tarry 
bureaucracy 	Plebiscite 	insolence 	dissemble 
communism 	sultan 	clarion 	pillage 
coup d'etat 	totalitarian state 	unshorn 	wanton 

James Asher (1977), TPR uses kinesthetic activities to teach English. Students engage in active language learning by demonstrating their comprehension through body movements. In early lessons, students are directed to stand up, turn around, sit down, or clap their hands. More complex commands follow, with participants eventually verbalizing commands to the instructor and their classmates.

Berty Segal popularized the TPR approach in his book *Teaching English Through Action* (1983). Based on the framework of normal first language development, Segal's methodology centered on the belief that reading and writing skills would be acquired after a firm foundation in listening and speaking was established. Students enjoy the gamelike qualities of TPR and value the opportunity to develop their listening skills before being required to verbally produce the new language.

Kinesthetic activities can also be used to improve content knowledge. How do you think a Preproduction student will most easily understand a lesson on how an electric circuit works: by hearing a lecture, reading a text, or acting it out? Would students at other stages of language development also benefit from acting things out (the planets rotating around the sun, for example)? Geometry is another content area where kinesthetic activities work well: ELLs will have a greater chance of learning and recalling terms if they use their arms to represent the radius, diameter, and circumference of circles or the right, acute, and obtuse angles of polygons. In history, drama, or English language arts, acting out an event or a story helps generate a mental image of the knowledge in the mind of the learner.

Classroom Example

Below is an example of how you can use a graphic organizer with ELLs.

Subject: Science

Content Objective: To classify organisms based on physical characteristics.

The class reads the following passage:

What are the main characteristics of reptiles?

A **reptile** (rep-til) is a cold-blooded vertebrate that has lungs and dry skin. Almost all reptiles have scales. Most reptiles live on land and lay eggs. Some give birth to live young. The eggs of reptiles are laid on land. These eggs have a tough covering that prevents the eggs from drying out on land. There are four main groups of reptiles. These are the alligators and crocodiles, the snakes, the lizards, and the turtles.

You can use the graphic organizer in Figure 4.3 to help students store knowledge about reptiles. Some of the circles can be left empty for a whole-class activity. The graphic organizer actually combines linguistic information (words and phrases) with nonlinguistic information (circles and lines representing relationships). It is called a descriptive pattern organizer because it represents facts that can be organized to describe characteristics of specific people, places, things, or events.

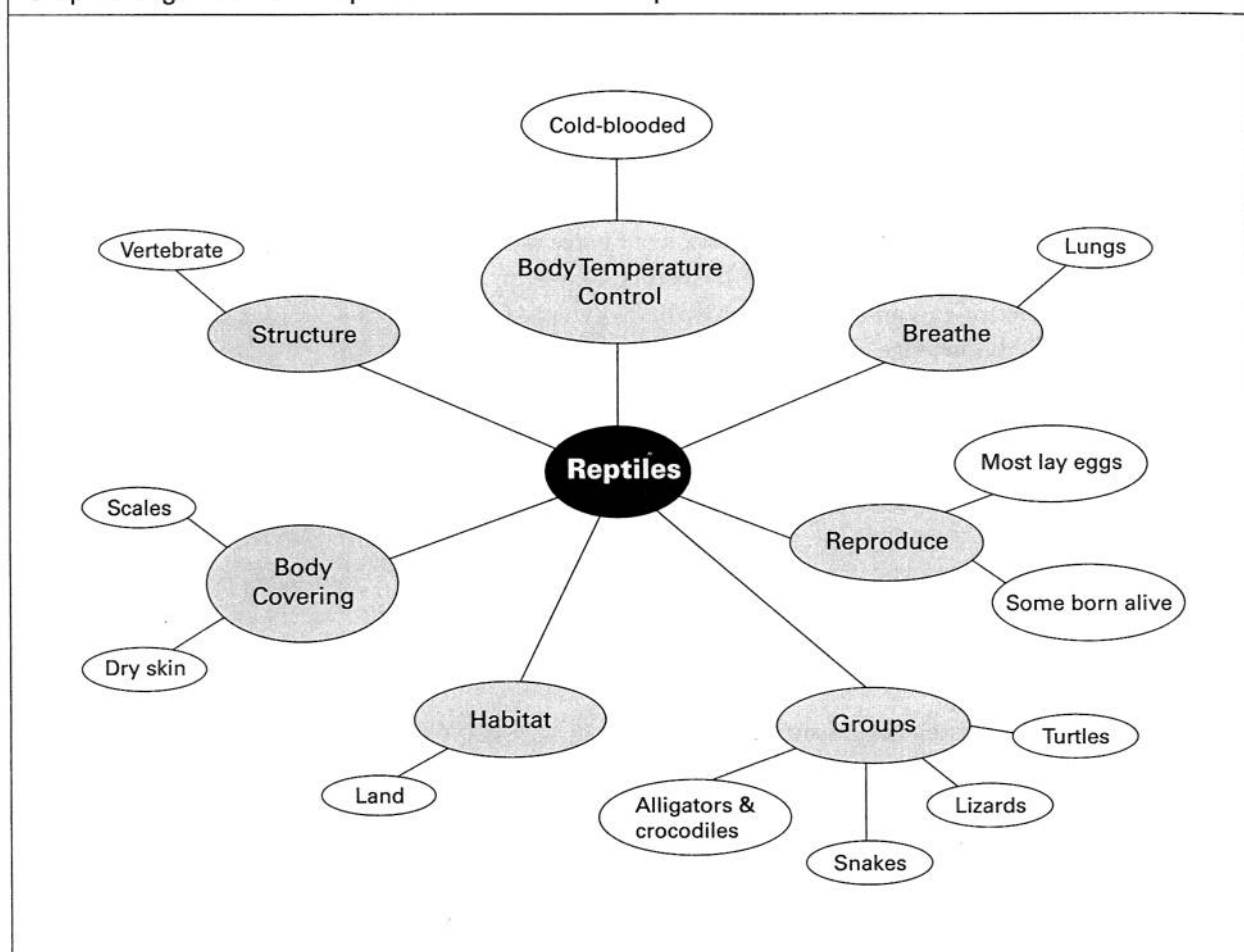
I definitely use a lot of visuals in my class to help make my second-language learners understand. I do a lot of vocabulary skits where students have to act out the meaning of a word.

—Kelly Gardner,
Berry Creek Middle School,
Edwards, Colorado

We do a lot of movement. Even if we are studying phonics and talking about phonics and talking about long and short sounds, I ask, "What are we going to do when we hear a long sound? What are we going to do when we hear a short sound?" Students move and make up the action. You will see them later in the year doing that same thing. Or with putting compound words together, they will start out with their hands apart, and then you see their hands come together—"Oh, dog house," (clap) "doghouse." It's that whole action thing.

—D. H.

Figure 4.3
Graphic Organizer for "Reptiles" Classroom Example



Preproduction

Students need to have pictures associated with the above topic and facts. During the class discussion, you can engage these students by using "Show me" or "Point to the" prompts.

Early Production

Students benefit from the pictures associated with reptiles and need to be encouraged to use the vocabulary. A cloze technique is effective in eliciting one-word responses. For example, you can lead students with phrases like: "A reptile breathes with . . ." or "The reptile's body is covered with . . ."

Speech Emergence

Students will be able to comprehend the passage, particularly given the graphic organizer. They can answer questions requiring a phrase or short sentence, such as “Tell me about reptiles.” Using questions that start with “Why” and “How” works well when eliciting responses at this level.

Intermediate and Advanced Fluency

Students will understand the passage and the graphic organizer, and can therefore be prompted with questions such as “How are they the same/different?” “What would happen if . . . ?” or “Why do you think . . . ?”

Once again, we remind you that anytime you use tiered questions, you should always take care to intermingle questions and prompts from your student’s next stage of language acquisition in order to scaffold language development.

Summary

Lessons using nonlinguistic representations are highly appropriate instructional strategies for ELLs. Students at early stages of language acquisition—those without full command of essential vocabulary and English grammar—will have difficulty demonstrating their conceptual knowledge through writing or by taking a test that requires reading and writing. For this reason, it is important to allow your English language learners to demonstrate their understanding through nonlinguistic representations.