

## **The Brain-Based Constructivist Classroom What On Earth Does That Mean?**

By Debbi Laidley

With all the emphasis on educational restructuring, school renewal, standardized test preparation, accountability and so much more, what's the big deal about adding a couple more terms to a parent's lexicon of school site jargon? Conversations with concerned parents have centered on a few recurring questions about the concepts of brain-based learning and constructivist principles in teaching. The following is a composite conversation that can provide parents with some answers, and can assist teachers in opening similar dialogues with parents.

### **In a nutshell, what does the term brain-based learning mean? Isn't all learning based in the brain?**

Brain-based learning refers to the body of knowledge about teaching and learning that is continually emerging from scientific studies of the brain and how it functions. When classrooms and schools focus on brain-based learning approaches, it means that they are looking at the conditions that are necessary to optimize the likelihood that the learning outcomes they are seeking will actually occur. Some of the conditions deal with relevance of subject matter, incorporation of students' interests and allowing for student choice, the role of emotions, the social aspects of learning, the importance of providing appropriate levels of challenge, and eliminating a sense of threat, just to name a few.

### **What about constructivism? Is that something different?**

Actually, the two go hand-in-hand. Constructivist principles of teaching and learning take into account what is known about the conditions under which the brain learns best. Constructivism is not so much a theory of how to teach; it is more a theory of how people learn. It is based on the concept that people always construct meaning of everything they encounter in the world. Consider a lesson on changes of seasons. The simple fact that a kindergartner recites the four seasons, or that a seventh grader listens to a lecture, taking notes and memorizing definitions, does not mean that the students have internalized the same meaning about how seasons change that the instructor (and the textbook designers) had in mind.

Constructivist approaches start with the recognition that students come to the learning process with some preconceived notions, beliefs, understandings and misunderstandings. They are never "empty pitchers waiting to be filled." Unless the learning experience allows students to explore their own ideas, develop hypotheses and challenge those hypotheses through exploration and experimentation, the notions they started with are likely to remain the same after instruction. Even though they may do just fine regurgitating the information they have determined the teacher wants for the test, students' privately constructed meanings can remain unchanged.

### **It sounds like a constructivist classroom is going to look far different from almost any classroom I've known. What should I expect to see?**

Of course classrooms differ widely in appearance, but certain elements are likely to be found in most constructivist classrooms. The classroom is unlikely to be set up in straight rows. You are

much more likely to see groups of desks pushed together for students to work cooperatively. Sometimes there may be chairs arranged in a circle, so that students can engage in a Socratic Seminar. Student work abounds, purchased manipulative materials and real world materials are used for experimentation and exploration. The teacher is usually not the focal point for lectures and demonstrations. Questions are posed by the students to each other and to the teacher, and do not come just from the teacher alone. Assessment of student learning occurs right along with the teaching; teachers will not wait until the end-of-unit test to find out whether or not students understand.

**I'm worried when I hear or read phrases like "Pursuit of student questions is highly valued," as opposed to "Strict adherence to fixed curriculum is highly valued." Does that mean that the necessary curriculum will be abandoned in favor of what students happen to be interested in? Will my child be unprepared for passing his grade level tests and state standardized tests?**

Some critics of constructivism have contended that the approach stimulates learning only based on concepts in which the students have a prekindled interest. That is far from true. One of the principles of constructivism is "posing problems of emerging relevance to students." This implies that even though students may not walk into the classroom pondering questions about motion mechanics, teachers can stimulate the emergence of student interest in the subject. By posing questions or setting the stage for problems, then asking students to predict or hypothesize, teachers can ignite the initial spark of interest. Students are further encouraged to reflect, analyze, compare, and contrast results of their studies.

Curriculum, therefore, is not abandoned. Skillful teachers use knowledge of the state curricular frameworks and grade level content standards to structure the scaffolding upon which they will guide students to construct deeper understanding. Rather than leave students unprepared for traditional testing, the stage is set for students to grasp meaning that goes even further than the scope of the typical multiple choice test.

Imagine a law school, medical school or seminar for MBAs. Classes are frequently taught using the Socratic Method, with students exploring "big idea" questions that are of relevance, then challenging their own and each other's assumptions as they delve for deeper understanding. These people tend to go on to do well on the tests that are subsequently required.

**How can I help my child at home when her classroom experience is so different from my own?**

The basics of supporting your child's learning have not changed.

- It is as important as ever that you visit your child's classroom. A visit will give a much better picture of what your child does at school and how she interacts with other children.
- Participate in any workshops that the school offers, particularly those that focus on classroom practices (or help plan such workshops).
- Ask your child's teacher for materials you can use at home to supplement what is happening at school.
- Find out what the teacher recommends students do when they do not understand something.
- Help your child develop a homework schedule that she can stick to.
- Emphasize effort and the role it plays in learning and achievement.
- Have your child teach you something she is learning at least once a week. Ask her questions that you are interested in about the topic, and really listen to understand her answers, without seeking to judge or critique.

- If you do not do anything else, read to your child or have her read to you, let her see you reading, and provide interesting library books and other reading materials all around your home.

#### References

Brooks, J.G. & Brooks, M.G. 1993. *In Search of Understanding: The Case for Constructivist Classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development.

Loreto Street School: Delving into Constructivism

By Rachel Glass Fairchild

Words cover every inch of the multi-colored walls. Questions beg for exploration: What kinds of animals are in the rainforest? How do they get their food? A map illustrates the surrounding community, including important landmarks like the fire station and McDonald's. In the corner sits a couch, a critical element of the library which boasts an extensive collection of books of all sizes. And everywhere you look there are students reading, writing, and sharing their learning with each other. This is the scene in Room 28b, Jamila Banks' K-1-2 combination class at Loreto Street School. It is truly a print-rich, constructivist environment. And it is just one of many in this forward-thinking school.

#### Questions guide the curriculum at Loreto Street School.

Using a variety of strategies, teachers encourage students to question what they are studying and then use those questions to explore the topic. In Jamila Banks' class, for example, students brainstorm what they know about the rainforest and what they would like to find out. Banks will use those questions to develop the unit. Teachers also use interactive homework to help tie learning to prior knowledge. Students talk to their families about a particular subject and bring the information back to class. Another important aspect of brain-based learning is reflection. In math, for example, students have to think back and explain how they found the answer to a problem. Susan Huntsman, a 2<sup>nd</sup> grade teacher, feels that these explanations tell her a great deal more about what the students have learned than whether or not they get the right answer.

## Constructivism Deconstructed

by Katrina Bias

Constructivism is a way of viewing how the teaching/learning process happens—it is neither a teaching strategy nor a technique. It is often associated with “play” vs. didactic teaching or with “discovery learning” from a well established set of experiences. Rather, constructivism is an educational philosophy grounded in the proposition that we construct our own meanings based on our understanding of the world and construct new understandings as we synthesize new experiences into that which we have previously understood. The application of this philosophy in the classroom results in opportunities for students to spiral through processes in which they continually shape new understandings.

The classroom teacher provides experiences, coaches and guides students through experiences, and most of all, asks questions through which students think about how they are synthesizing their new understandings into their view of the world. How does this look? Does it mean a whole new way of teaching? Must I re-design my classroom for another new “teaching strategy”? The answer to both questions is an emphatic “no.” Since constructivism is a philosophy, the required component is that the teaching/learning experiences are structured with this basic principle in mind: teaching for understanding.

From a list of many published authors who discuss constructivism in the context of the modern educational system, several stand out as “gurus” of the constructivism classroom. The following are some important points from the writings of the “gurus.”

**Guiding Principles:** Jacqueline Brooks and Martin Brooks have written an excellent guide for incorporating constructivism into classroom experiences. They suggest five guiding principles for classroom experiences based on constructivism—discussed fully as Part II of their book—which are summarized in the chart in figure 1, to which a corresponding question for the teacher to consider for application has been added (Brooks and Brooks, 1993).

**Backwards Planning:** Grant Wiggins and Jay McTighe suggest a method for planning constructivist experiences from the need for deeper understanding of curriculum content. They offer three stages in planning a curriculum based on understanding, which is “backwards” from the traditional planning of instruction (Wiggins & McTighe, 1998).

See *fig. 2*

**Curricular Priorities:** Wiggins & McTighe also indicate that there are three priorities used in designing the learning experience: (1) Enduring understandings are the “big ideas” from the area of study, those ideas that will remain with the student well beyond the study of the unit and have applications to their real life experiences. (2) Knowledge and skills are those things that are important to know and do. Students will have encountered these knowledge and skills components in the learning experience. (3) The knowledge that is worth being familiar with are those facts, principles, laws, etc. that will have meaning because of the learning experience. These priorities move from general to specific in planning experiences, consistent with the “backwards planning” outlined above. The diagram in figure 3 indicates how each curricular priority is part of the larger picture (Wiggins & McTighe, 1998).

In designing constructivist-based classroom experiences, the instructor is able to create units of study by asking questions using the three priorities. For example, in studying the Civil War, one of several enduring understandings might be that the North-South conflict was woven around a myriad of circumstances that contributed to the cause of the Civil War. Things that might be important to know and do may include analyzing cause and effect, superimposing separate circumstances on a larger event, making connections to chronological events, or relating economics to the ability to maintain an army. Students will be able to relate some facts to new understandings and therefore become familiar with some of the major battles and their significance

in the winning of the war, economic principles that determined turning points during the war, or the effects of particular social events on a population.

**Project-Based Instruction:** Janet Kierstead offers a roadmap for providing student experiences that are based on constructivism through project-based learning. By using a “final project” as a means of engaging students in experiences, the result is an application of skills and knowledge to problems in the real world. Below are the seven experiences students should have in project-based instruction (Kierstead, 1992):

- engage in a variety of experiences;
- put their thoughts into words—verbally and in writing;
- use tangible experiences and primary sources;
- create authentic products to exhibit conceptual understanding;
- use methods, processes, vocabularies intrinsic to the content;
- put together concepts and apply across subject matter boundaries;
- weigh personal/group norms against implications of new learning.

It is hoped that this discussion has opened a window into the world of constructivism, but hopefully, it will pique your interest to learn more. It doesn't take a big change nor a complete abandonment of your current practices to engage in constructivist thinking for the classroom. Just spend some time reading, talking with others, and most of all thinking. Then try one or two ideas as you learn. In turn, help your students to acquire understanding at a deeper level and to carry their understandings to new learning.

References:

Brooks, J. G. and Brooks, M. G. 1993. *In Search of Understanding: The Case for Constructivist Classrooms*, Alexandria, VA: ASCD.

Kierstead, J. 1992. *Providing Opportunities for Advanced Learning*. Articles for California School Leadership Academy.

Wiggins, G. and McTighe, J. 1998. *Understanding by Design*. Alexandria, VA: ASCD.

Question For Application

Guiding Principle

How might the selection of projects pose questions that relate to students' real-life experiences?

Pose problems of emerging relevance to students

What are the major concepts that students should understand?

Structure learning around primary concepts

How might student entry points be identified?

Seek and value students' points of view

What is involved in structuring the experiences that will build bridges from present understandings to new understandings?

Adapt curriculum to address students' suppositions

Assess student learning in the context of teaching

How might we move from right/wrong to monitoring students' understandings?

fig. 1

Identify desired results

Determine  
acceptable  
evidence

Plan learning experiences  
and instruction

fig. 2

1999

1999

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fig. 3

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