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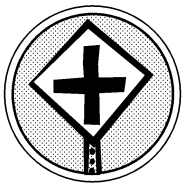 **Problem-Based Learning**	*Your Vote Counts* (voting responsibility) p. 11	*Designer Genes* (posthole: genetic engineering) p. 15	*It's Out There!* (outdoor education experience) p. 19
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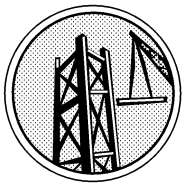 **Project Learning**	*Biography: Puppet and Presentation* (genre-related project) p. 87	*The Many Ways of Knowing Our Community* (template project) p. 90	*Cataboom* (structured project) p. 93
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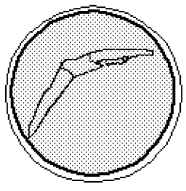 **Performance Learning**	*Tumbling* (P.E. demonstration on Parent Night) p. 137	*"How to" Speech* (class presentation) p. 139	*"The Decades in Review"* (musical production) p. 142

Introduction

Two distinct arenas of research are impacting the educational scene: brain research and school reform. Existing research on the brain focuses on how the mind constructs meaning (Caine and Caine 1991), the many forms of cognition, and how we express knowledge (Gardner 1983). This research is complemented by the voices of school reform (Goodlad 1983; Sizer 1992; Boyer 1984), who advocate models of schooling that embrace more learner-centered structures. These structures include uninterrupted chunks of class time, teams of teachers working collaboratively, and groups of kids learning together over time. The implications of these ideas manifest themselves in educational innovations such as block scheduling, multiage classrooms, and year-round education. These innovations show that we are making a gradual shift in how instruction, assessment, and curriculum, in particular, are being approached.

Curricular reform plays a key role in the migration toward holistic, integrated, and brain-compatible models of learning. If instruction and assessment are the cornerstone of what really happens with learners in the classroom, then curriculum is the foundation of the school programs. It is the curriculum that determines what and how teachers spend their instructional time in the classroom. It is the curricular focus that dictates what is tested, assessed, and evaluated, both formatively and summatively.

What Comes First? Assessment or Instruction?

The saying "assessment drives instruction" refers to a well-known and widely accepted practice of teachers "teaching to the test" (or tests), and rightly so. If teachers know what their students are going to be held accountable for, they have an obligation to prepare their students in those areas. For example, if teachers know that students are going to be tested on the state government,

teachers target the government as a priority topic. In addition, if the test is designed to assess a student's recall of facts, data, and information, then teachers spend their time helping students become proficient at recalling facts, data, and information.

However, what is often not considered is that the tests are based on *someone's* view of the valued curriculum. If the state government is on the test, then *someone* has determined that the state government is worth knowing about. In turn, if *someone* determines that the actual assessments should focus on recall rather than reasoning, then the instructional time also focuses on recall, because that is what is most likely to guarantee success for the students being tested. Consider now a reverse axiom regarding assessment as stated by Eisner (1985), "If it's not worth teaching, it's not worth testing. First, we must decide what's worth teaching." That's where curriculum comes in.

Because the curriculum is the foundation of instruction and assessment, valued learner qualities and content must be determined before any substantive discussions about instruction and assessment begin. A curriculum rich in conceptual content, life skills, and processes, and which has integrity, dictates the same kind of instruction and assessment.

Consider the state government discussed earlier. If the tests focus on reasoning rather than recall, students must thoughtfully problem-solve authentic situations involving the state constitution. Therefore, teachers must earnestly prepare students in rigorous and multidimensional applications of the constitutional principles. This shift in the focus of testing occurs only if and when the following occurs: *someone* values reasoning as well as recall in the curriculum; the curriculum requires students to approach real problematic situations; expectations are set for students to learn to work through the problems, consider the alternatives, and advocate solutions; and the assessments are designed in such a way that students are asked to perform these kinds of authentic tasks.

When these criteria are met, instruction and assessment become synchronised with the goals of a strong curriculum.

Curricular Frameworks

This book presents a survey of six curricular frameworks for problem-based learning developed in conjunction with Gardner's theory of multiple intelligences: problem-based learning, case studies, thematic learning, project learning, service learning, and performance learning. Figure 1 provides a quick reference to the stages involved in each curricular model.

Problem-Based Learning

Problem-based learning (PBL) is a curricular model that uses an authentic problem as the impetus for learning. It begins with an ill-structured, open-ended problem, such as the controversy at one middle school about what its students really need to learn. This problem