concepts and facts. Thus, real learning cannot be spoon-fed, one skill at a time.

Logically, then, to become adept at thinking and reasoning, students need practice in solving real problems and comprehending complex texts. Not surprisingly, students given instruction aimed at conceptual understanding do better on skills tests than students drilled on the skills directly (Carpenter et al. 1988). Thus, the practice of postponing higher-order thinking goals until low-level skills have been mastered is harmful. Low-achieving students suffer most from a proficiency-driven curriculum because they are consigned indefinitely to dull and repetitive skills instruction that does not enable them to grasp underlying concepts (Levin 1987).

Moreover, test-defined instruction has the effect of driving out good teachers and "deskilling" those who remain (McNeil 1988). Teachers with the least content knowledge might feel secure in leading students through worksheets fashioned after the tests, even if they become less skilled as teachers in the process. Teachers who know the most about content, however, are insulted when external mandates prevent them from using their own expertise to devise instruction. They must either find a way to resist the deskilling, as in McNeil's magnet schools, capitulate, or get out of teaching.

Finally, teaching to the test devalues the meaning of the test results themselves. By having students practice on "remarkably similar" items, teachers can improve their test performance, but gains from this type of teaching do not necessarily generalize to independent measures of the same content. Thus, test scores can go up without a commensurate gain in achievement. To really assess what students know, legislators and school boards would need a completely new test for each administration.

Substantively Better Assessments

Twenty years ago, standardized tests served as reasonable indicators of student learning. In today's political climate, tests are inadequate and misleading as measures of achievement. Assessment tasks should be redesigned—indeed, are being redesigned—to more closely resemble real learning tasks. Tests should require more complex and challenging mental processes from students. They

Authentic Assessment in California

California Assessment Program Staff

California's commitment to authentic assessment rests on a clear vision of a powerful curriculum built on a proper understanding of the nature of learning and knowledge. Thinking—a knowledge-based, discipline-oriented function—is the centerpiece of our reform curriculum. All students are encouraged to think, engage in real-world problem solving, and share in the rich, challenging curriculum that respects the integrity of the disciplines yet emphasizes the connections among them.

The right events are in alignment to redesign statewide assessment to support this curriculum: educators realize that what you test is what you get, support from them is strong, and the state is funded to revise all assessment instruments at five grade levels in all major content areas. By sampling students within schools, we can implement a performance assessment that will reward the right kinds of instruction and have the desired impact on local programs. Not incidentally, California has 15 years of experience with matrix-sampling—the key to reducing the high cost of performance assessment.

California already has a performance measure in place at two grade levels, the teacher-developed California Assessment Program (CAP) writing assessment. The use of matrix sampling enables us to assess eight types of writing at each grade level. At grade eight, for example, students write an autobiographical incident, a report of information, an evaluation, a problem solution, a firsthand biography, a story, a speculation about causes or effects, or an observation. CAP plans to develop an integrated English-language arts assessment worthy of the literature-based curriculum now being implemented throughout the state. Direct assessment methods, both oral and written, will be extended to measure students' understanding of text and their response to literature. Schoolwide pilots of portfolio assessment of reading and writing across the curriculum are under way, aiming to develop several models tailored to diverse school settings.

Guided by the California Mathematics Framework and the recently published Curriculum and Evaluation Standards of the National Council of Teachers of Mathematics, CAP's new mathematics assessment will use a variety of approaches. Strategies will include student portfolios and performance tasks that give students an opportunity to persist in complex problem-solving situations and to pursue alternative approaches. Among the procedures in the planning stage are "curriculum assessment modules," group tasks spanning three to five days, during which time students will be stopped periodically and interviewed about their work.

Science educators are experimenting with performance tasks, buoyed by their direct observations of "practical" assessment in England. They plan to directly measure key process skills—observing, comparing, communicating, organizing, relating, referring, and applying—both individually and in groups and through both oral and written tasks.

Perhaps our greatest challenge is designing an assessment to match the bold new History-Social Science Framework. To support this curriculum, teachers will be encouraged to use a full range of technology and oral, written, and performance measures, including mock trials, debates, simulations, and field trips.

Our timeline calls for statewide performance testing by 1991. Much has been accomplished on this long journey toward authentic assessment, and we are optimistic that we can meet our goal.

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