

1035-97-1402

Lloyd Bond* (bond@carnegiefoundation.org), 51 Vista Lane, Stanford, CA 94305. *Declarative and Procedural Knowledge in Quantitative Reasoning: Knowing "What" and Knowing "How"*.

The pattern of academic performance characterized by "high grades/low test scores" is more common than most might suspect. This pattern is especially in evidence when performance in the typical high school math curriculum (Algebra I, Geometry, Algebra II) is compared with performance on measures of quantitative reasoning such as the SAT-Mathematics test. This paper analyzes a set of "think aloud" protocols of students with the above performance pattern attempting to solve selected quantitative reasoning items from a retired SAT-M. Their protocols indicate adequate, even superior, declarative knowledge of algebra and geometry, but the knowledge is largely inert, is almost entirely verbal, is inaccessible during problem-solving, and is highly precarious. By contrast, their procedural knowledge, or more precisely, their procedural use of declarative knowledge is grossly deficient and largely unpracticed. The results are discussed in the context of effective instructional practices. (Received September 19, 2007)