Cognitive Rigor in Today's Classroom

Using a Cognitive Rigor Matrix to Advance Complexity of Thoughts

by Karen Hess

Cognitive rigor encompasses the complexity of content, the cognitive engagement with that content, and the scope of the planned learning activities. The Hess Cognitive Rigor Matrix (CRM) is a tool that has significant potential to enhance instructional and assessment planning and practices at the classroom level (Hess, Carlock, Jones, & Walkup, 2009). The CRM superimposes two different cognitive complexity measures – Bloom's Taxonomy and Webb's Depth of Knowledge – to produce a means of analyzing the emphasis placed on curricular materials, instructional focus, and classroom assessment. Bloom's Taxonomy categorizes the "type of thinking processes" necessary to answer a question. Webb's Depth of Knowledge, on the other hand, relates more closely to the depth of content understanding and scope of a learning activity, which manifests in the skills required to complete a task from inception to finale (e.g., planning, researching, drawing conclusions). Each intersection of Bloom-Webb in the matrix provides a focus on differing complexity.
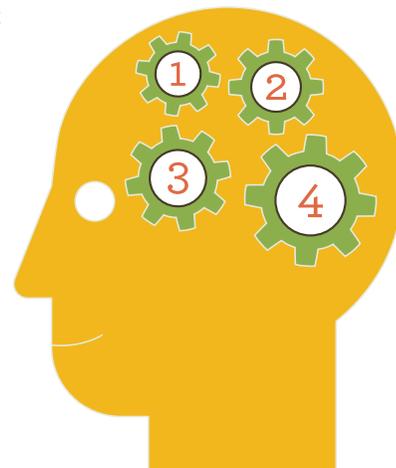
Ensuring that curriculum is aligned to "rigorous" grade-level content standards is, in itself, insufficient for preparing students for the challenges of the twenty-first century. Current research on the factors influencing student outcomes and contributing to academic richness and student engagement supports the concept that learning is optimized when students are involved in activities that require complex thinking and the application of knowledge. Expert teachers provide all students with challenging tasks and demanding goals, structuring learning so that students can reach high goals. Expert teachers know how to enhance both surface and deep learning of content (Hattie, 2002). Students learn skills and acquire knowledge more readily when they understand concepts more deeply, recognize their relevance, and can transfer that learning to new or more complex situations. Transfer is more likely to occur when learners have developed deep understanding of content and when initial learning focuses on the underlying principles ("big ideas") and cause-effect relationships (NRC, 2001).

As educators become more skilled at recognizing the elements and dimensions of cognitive rigor and analyzing its implications for instruction and assessment, they can provide learning opportunities that benefit all students, across all subject areas and grade levels. In essence, the role of a school system is to prepare students by providing them with an aligned curriculum with differentiated emphasis on each of the four depth-of-knowledge levels. The cognitive rigor matrix can serve as a constant reminder to educators that students need exposure to novel and complex activities every day.

References:

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