

CCI Recommends . . .

Five articles on student intellectual development

Angelo, T.A., *A "Teacher's Dozen": Fourteen general, research-based principles for improving higher learning in our classrooms*. AAHE Bulletin, 1993: p. 3-13.

Three assumptions are key to improving instruction: 1. To encourage learning, faculty need to understand how students learn; 2. Educators should be aware of existing research-based teaching practices that can improve learning; 3. Individual faculty can identify which techniques best meet their needs. The author presents fourteen principles to improve learning with implications for classroom practice.

Baxter, G.P., A.D. Elder, and R. Glaser, *Knowledge-based cognition and performance assessment in the science classroom*. Educational Psychologist, 1996. **31**(2): p. 133-140.

More effective learning is indicated by higher quality of explanations, better problem representation, improved solution strategies, and more frequent self-monitoring. Appropriate assessments can enhance these performance skills and advance intellectual development.

Kruger, J. and D. Dunning, *Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments*. Journal of Personality and Social Psychology, 1999. **77**(6): p. 1121-1134.

Low-performing students can't recognize their own incompetence and lack the skills necessary for accurate self-assessment (ignorance is bliss). Less competent students overestimate their ability and performance on objective tasks, are less likely to recognize competent performance, can't use comparative data to correctly assess their own ability; and will only improve their recognition of their lack of skills by becoming more accomplished students.

Marton, F. and R. Saljo, *On qualitative differences in learning: I - Outcome and process*. British Journal of Educational Psychology, 1976. **46**: p. 4-11.

Examines how concepts are interpreted by different students. Students read a passage and responded to a question based on the reading. Not only is there a difference in how much is learned but, perhaps more importantly, there is a significant difference in what is learned. "A" students clearly understood the writers view, C and D students missed the main point of the passage.

Redish, E.F., *The implications of cognitive studies for teaching physics*. American Journal of Physics, 1994. **62**(6): p. 796-803.

This paper serves a primer on cognitive studies, especially constructivism. It is presented as a four principles with corollary statements: 1: People organize experiences into mental models; 2: It is easy to learn something that relates to an existing mental model; 3: It is difficult to make substantial changes to an existing mental model; 4: Different students have different mental models.