Policy Discussion: What We Know about Brain Development and Cognition and What This Means for Pedagogy

Monday, May 21, 2007 – 10.15 - 11.30 am
Continental Divide
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The science of learning, from the perspective of a neuroscientist, spans multiple levels of research, from the cellular basis of learning and memory to functional magnetic resonance imaging of subjects engaged in cognitive tasks. Linking the discoveries by experimental neuroscientists to the theoretical foundations of intellectual development is a daunting task; however, there are common themes that emerge from both human and animal studies that can help to shape our ideas of how individuals learn. This seminar will attempt to illustrate these common themes, using examples that relate to language development, gender differences in cognitive abilities, recovery from brain injury, attention deficit disorder, and post-traumatic stress disorder. It will describe some experiments currently in progress in the classroom, where active-learning strategies are being used to help students master introductory biology. These experiments, designed by active research faculty, illustrate the challenges for both the teacher and the learner in creating an environment conducive to learning.

Biographical Information on the Speaker

Gwen Jacobs is a professor of neuroscience and assistant chief information officer and director of academic computing at Montana State University, Bozeman. Her research spans several fields of neuroscience, as well as the emerging field of informatics and databases for the scientific community, focusing on development, plasticity, and systems neuroscience with a special emphasis on structure function relationships in the nervous system and information processing in sensory systems. Her work has been funded continuously for the last 25 years by both the National Institutes of Health (NIH) and the National Science Foundation (NSF).

Jacobs received her undergraduate training in human anatomy and physiology from U.C. Berkeley and earned a master’s degree in physiology from U.C. Davis and a Ph.D. in neuroscience from SUNY Albany. She was a faculty member at U.C. Berkeley for 15 years prior to taking her current position at Montana State University, where she heads the Department of Cell Biology and Neuroscience. She directs the Howard Hughes Undergraduate Biology Program, an effort to infuse mathematics and quantitative reasoning into the introductory biology sequence in her department. At the national level, she was a member of the National Science Foundation’s Biological Sciences Advisory Committee for six years, serving as chair for one year, and has also been a member of the National Advisory Research Resources Council and the Society for Neuroscience Committee on Informatics. She’s currently a member of the Pacific Northwest Gigapop Advisory Board.
Jacobs maintains a very active research program in three distinct but overlapping areas of research: probabilistic and compartmental modeling of neural systems; neuroinformatics, specifically the development of semistructured databases; and computational tools for use by the scientific community. She is the principle investigator of the Lariat Networking project, an effort to upgrade the physical network infrastructure in six rural state institutions, thereby improving the research competitiveness and collaborative activities of biomedical researchers at those institutions.