Prior Knowledge and Misconceptions in Learning

Introduction

Current research documents the role prior knowledge plays in learning. What the learner already knows, gaps in knowledge, and misconceptions, all influence the understanding of new information. The articles and websites below discuss research in this area and present ways instructors can use students’ prior knowledge in teaching.

General Resources

Examines the role prior knowledge plays in helping students understand and organize new information. Discusses the importance of gathering information on students’ prior knowledge, gaps, or misconceptions, and describes ways to use students’ prior knowledge when presenting new information. Linked with permission of the POD Network.
http://academicaffairs.mnscu.edu/facultydevelopment/resources/pod/Packet14/whattheydon%27tknowcanhurtthem.htm [1]

“Learning in Interactive Environments: Prior Knowledge and New Experience,” Jeremy Roschelle, University of Massachusetts, Dartmouth.
Provides a thorough explanation of what research shows about the role of prior knowledge and misconceptions in learning, especially in science education.

“Background Knowledge,” prepared by Nicole Strangman and Tracey Hall, National Center on Accessing the General Curriculum.
Summarizes research on the role of prior knowledge in reading and learning and strategies for building prior knowledge. Provides numerous annotated links to Internet resources on prior knowledge for K through college teaching plus a bibliography of hard copy journal articles and books.
http://aem.cast.org/about/publications/2004/ncac-background-knowledge-udl.html#.Vjka5yiPQ5g [3]

A complete online copy of this well-respected book on cognitive learning theory and its implications for teaching. See especially chapter 3, Learning and Transfer, for information on the influence of prior knowledge in learning new information.
Recognize Who Your Students Are (Carnegie Mellon University).
Considers four areas that impact students’ learning and performance in class: prior knowledge, intellectual development, cultural background, and generational experiences and expectations.
http://www.cmu.edu/teaching/design/teach/design/yourstudents.html

A Private Universe (Harvard-Smithsonian Center for Astrophysics).
Free online 20-minute video documentary on education research showing science misconceptions of students graduating from Harvard and bright 9th graders. A classic.

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Links