ONLINE SCIENCE LEARNING: 
Best Practices and Technologies

Authored by: Kevin F. Downing and Jennifer K. Holtz, 
DePaul University, USA, ISBN: 978-1-59904-986-1 
372 pages; 2008

Reviewed by TOJDE

This essential publication is for all research and academic libraries, especially those institutions with online and distance education courses available in their science education programs. This book will also benefit audiences within the science education community of practice and others interested in STEM education, virtual schools, e-learning, m-learning, natural sciences, physical sciences, biological sciences, geosciences, online learning models, virtual laboratories, virtual field trips, cyberinfrastructure, neurological learning and the neuro-cognitive model. The continued growth in general studies and liberal arts and science programs online has led to a rise in the number of students whose science learning experiences are partially or exclusively online. character and quality of online science instruction.

ABOUT THE AUTHORS

Kevin F. DOWNING is an associate professor at DePaul University’s college for adult learners, the School for New Learning. His research interests include the investigation of Miocene fossil mammals in the western United States and Pakistan, the character of small mammal diversity and paleoecology through volcanic disturbances and global cooling maxima, the record of stratigraphic and paleogeographic change during the Himalayan Orogeny, and the application of 3-D virtual laboratories for geological instruction in distance learning settings. He was one of the three faculty tasked with establishing the distance education (DE) program for adults at DePaul, is the author of several science course guides for the DE program, and regularly teaches online science courses. Dr. Downing has published widely in paleontology and stratigraphy, and has presented papers on the application of 3D learning objects to online geoscience education. Dr. Downing received BS degrees in astronomy and geology from the University of Illinois at Urbana, a Master of Science in Teaching degree in geology from the University of Florida, and a PhD in geoscience with emphasis in paleobiology from the University of Arizona.
Jennifer K. HOLTZ is an assistant professor at DePaul University’s college for adult learners, the School for New Learning. Her areas of interest include the actual act of research and characteristics of researchers, how creativity affects both teaching and learning in the sciences and the implications of brain research to learning. Since joining DePaul University, she has authored multiple distance course guides in the sciences and teaches almost exclusively online, including the mentoring of distance students. Dr. Holtz has published widely in clinical sciences, clinical education, and in distance learning and assessment in the sciences. Her PhD is in adult, continuing and occupational education with emphasis in research education, from Kansas State University; her master’s is in gerontology with clinical emphasis, from Wichita State University, and her bachelor’s is in biology with emphasis in human biology, from Kansas Newman College (now Newman University).

TABLE of CONTENT

Science Education and Online Science Learning

Section I
Chapter I: Online Science: Its Role in Fostering Global Scientific Capital
Chapter II: Controversies and Concurrence in Science Education
Chapter III: Virtual School Science
Chapter IV: Taking University Science Education Online
Chapter V: The Role of Practical Work in Online Science
Chapter VI: Knowledge Transfer and Collaboration Structures for Online Science

Section II
Online Science Instructional Strategies and Technologies

Chapter VII: Online Science: Contemporary Approaches to Practical Work
Chapter VIII: The Cutting Edge: Promising Technologies and Strategies for Online Science Education

Section III
Assessing Online Science Learning

Chapter IX: Assessing Science Competence Achieved at a Distance

Section IV
Disciplinary Examples in Online Science Courses

Chapter X: Online Mathematics and Physical Science
Chapter XI: Online Geoscience Courses
Chapter XII: Online Life Sciences

Section V
Best Practice Model for Online Science Learning

Chapter XIII: A Didactic Model for the Development of Effective Online Science Courses