Chapter XV

Using Learning Objects in K-12 Education: Teachers and QuickScience™

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Abstract

Reusable Learning Object technology offers K-12 teachers and students the opportunity to access resources that can be used and reused in classroom teaching and learning environments. A support tool for teachers, QuickScience™, was developed to help teachers and students improve performance in science standards; resources in QuickScience™ are built upon RLO technologies. Six types of RLOs, including five types of instructional resources aligned to Bloom’s taxonomy, are used by teachers to help students improve their performance in science. QuickScience™ offers teachers a model for improving performance, including steps of diagnose, plan, teach, and assess.
Introduction

Teachers face a myriad of challenges and responsibilities in today’s accountability and reform movement. They are graded and evaluated in ways that were unknown a short 20 years ago. The No Child Left Behind (NCLB) Act mandates teacher qualifications and student assessment designed to enhance student performance in curriculum standards. NCLB provides opportunities for all students and teachers to succeed and requires that all states increase performance. In the area of science, all states must administer an assessment to students beginning in the 3-5 grade cluster, by the 2007-2008 school year. By 2005, all teachers were to be highly qualified, meaning that teachers must be certified to teach through initial certification, alternative certification, or through professional development (NSTA, 2003). Many teachers have been instructing science without credentials or a deep understanding of the instructional content. It is likely in such cases that students are not receiving challenging content that will assist them in developing strong science-based inquiry skills.

School administrators and teachers routinely analyze data to determine gaps between performance on high-stakes tests and desired performance in the next academic year; many schools pinpoint specific areas of weakness to serve as targets for school improvement. In most cases, teachers are then left with the choice of how to achieve the desired performance in the classrooms and begin their quest for activities, resources, and instructional materials that can meet student needs and curricular requirements. This process has only recently begun for science, as many schools have focused on reading and math, already tested curriculum.

With the implementation of reform and accountability resting squarely on the shoulders of teachers, model interventions must be available to guide, nurture, and spark creative ideas for the classroom. Teachers must take the lead to design learning environments and provide instructional resources that increase student performance. Finding appropriate resources and molding them together is key to success, and, hopefully, increased performance. Teachers search for standards-aligned curriculum resources that are accessible and readily available.

These demands force re-examination of how technology can be used to support teachers and students in classroom learning environments. The challenge of standards is here and waiting for a response. New technologies are available that can be used to support teachers in their quest for resources that both involve science and performance. One of these technologies is based on a reusable learning object model.