

# Using Digital Libraries to Build Educational Communities: The ChemCollective

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## ABSTRACT

The ChemCollective is a new project in the targeted research track of the National Science Digital Library (NSDL). The project (<http://www.chemcollective.org>) was launched in spring 2004 at the National American Chemical Society (ACS) and National Science Teachers Association (NSTA) meetings. The research goal is to explore the degree to which digital library structures can attract and support a community of educators working towards a common vision of educational reform.

## Categories and Subject Descriptors

K.3.1 [Computers and Education]: Computer Uses in Education – *collaborative learning, computer-assisted instruction (CAI), distance learning.*

J.2 [Physical Science and Engineering]: *chemistry.*

## General Terms

Measurement, Performance, Design, Experimentation, Human Factors, Theory.

## Keywords

Chemistry education, education reform, digital library, online education, virtual laboratory, scenario-based education.

## 1. INTRODUCTION

The ChemCollective supports users in authoring virtual labs and scenario-based learning activities; it provides a means for teachers to share classroom experiences, especially regarding data that can be used to assess learning objects; and it acts as a focal point for discussions about specific pedagogical and domain issues. The use of multiple forms of meta-data, including tagging content against traditional and reformed course structures, is being actively investigated as a means to guide the reform process.<sup>1</sup>

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## 2. GENERAL APPROACH

The education reform goals of the ChemCollective are focused on two areas: (a) helping students connect the algebraic manipulations inherent in introductory chemistry courses with authentic chemistry processes, and (b) using scenarios to link these processes with the real world.

## 3. TECHNOLOGY

The base technology for the project is our Virtual Lab, a chemistry-lab-on-a-computer which allows authoring and sharing of practical chemistry learning activities to achieve the first goal listed in section 2. Our CreateStudio is a learning object assembly tool designed to achieve the second goal. Instructors can use it to create real-world scenarios (such as remediation of groundwater poisoned by arsenic, or development of a new fuel for a mission to Mars) by coupling simulations such as our Virtual Lab with multimedia software such as QuickTime VR. This allows navigation through virtual works and video clips that contextualize the learning.<sup>2,3</sup> A digital library of 55 laboratory activities and scenarios, of which 25 were authored by community members, is already in existence and is freely available for use.

## 4. ADDITIONAL AUTHORS

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## 5. ACKNOWLEDGMENTS

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