Chapter IV

Starting With What We Know:

A CILS Framework for Moving from Physical to Virtual Science Learning Environments

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Abstract

This chapter examines attributes of learning in informal environments, using a research framework developed by the Center for Informal Learning and Schools. It considers how essential characteristics of learning within science centers can translate and apply to learning in Web-based informal learning environments. It argues that in designing virtual environments, informal science institutions need to build on their particular strengths and pedagogical design principles in order to fill an educational niche in the Web landscape, and not compete with commercial or even K-12 educational agencies similarly engaged in the development of online learning environments.

Introduction

Cultural institutions — historical societies, art museums, zoos, botanic gardens, science museums, and science centers, for example — offer their communities unique sets of

subject-matter resources and expertise. They are adept at designing environments that can engage learners at all age levels and prior knowledge. They know something about sparking curiosity and more deeply drawing visitors into the subject matter.

Yet, much of this knowledge is unanalyzed and unarticulated among educator practitioners in these institutions. As cultural institutions move from the development and mediation of exhibit environments to the development of print or Web-based learning tools and environments, it is important that they start from who they are and what they are (Bevan & Wanner, 2003). They need to build from their unique approaches, pedagogies, and collections in order to be the best that they can be, and also to avoid competing with commercial or even K-12 entities on terms that are not their own.

At the Center for Informal Learning and Schools, a U.S. National Science Foundation-funded initiative[1] to strengthen K-12 science education through the generation of new leaders and knowledge in the domain of informal learning, we focus our work with practitioners on deepening their understanding of the environments that they work in and the underlying pedagogical principles that inform those environments. We do this through series of institutes that meet over a two-year period to create shared experiences involving learning science through the exhibit collections, as well as promoting group discourse around a number of ideas and thinkers concerned with science teaching and learning.

CILS is a partnership of the Exploratorium, King's College London, and the University of California Santa Cruz. Since its inception in 2002, CILS has worked with over 100 museum educators, has enrolled two dozen graduate students, and has launched a dozen studies investigating informal learning institutions and opportunities. The purpose of CILS is to strengthen alliances between informal and formal systems of education. These alliances can be leveraged to enhance and expand student interest and understanding of the subject matter taught in schools. They also can ensure that the wealth of cultural resources housed in museums are made accessible to, and shape experiences of, audiences from socio-economic groups who traditionally do not visit museums.

CILS has begun to articulate areas of knowledge informal educators require in order to form effective alliances with schools. We have also developed a research framework for asking questions of these environments and alliances. Drawing on these two areas of focus — on practice and research — this chapter will examine, from a practitioner point of view, some of the particular attributes of learning environments of cultural institutions and their implications for the design of virtual environments, particularly for school audiences.

Looking at Cultural Institutions

While schools, too, are cultural institutions, within this chapter the use of the term "cultural institutions" refers to institutions and organizations that collect, curate, and program public learning environments for visitors of all ages and backgrounds. These include museums, historical societies, botanic gardens, nature centers, science centers, zoos, etc. I use the shorthand "museums" for "cultural institutions" interchangeably

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