

# Web-Based Multimedia Children's Art Cultivation

**Hao-Tung Lin**

*National Chi-Nan University, Taiwan, R.O.C.*

**Herng-Yow Chen**

*National Chi-Nan University, Taiwan, R.O.C.*

## INTRODUCTION

With the rapid advance in Web and multimedia technologies, authoring various types of multimedia content and distributing them on the Web has been very popular for many years. These technologies are applied in e-learning extensively, such as from language learning (e.g., ESL) to professional domain knowledge (e.g., computer science). In contrast, e-learning systems focusing on art domains, especially for kids or teenagers, are few. This is a notable shortcoming, because from a technical viewpoint, current advances in multimedia technology via the Web promise this kind of application. On the other hand, compared with technologies needed for more general-purpose knowledge, cultivating children's art through e-learning technology needs much more edutainment ingredients – it must be interesting and interactive and offer multimedia. Realizing this kind of e-learning is really a challenge, not only from a pedagogical viewpoint (the first ingredient) but also technical ones (the latter two ingredients).

In this article, we describe how our framework design for online authoring and presentation works. The goal of this framework is to provide a universal platform that enables students to learn more actively through sharing their own pieces easily with other learners. Peers and teachers can comment on students' work for further discussion or instruction.

To this end, a multimedia authoring and presentation tool named "My E-card" (<http://media.csie.ncnu.edu.tw/haotung/myecard/>) has been designed to allow students to combine different-media objects (such as a painting object, typing object and music object) into a time-ordered, synchronized multimedia document (i.e., animated sound painting). Students can import any existing media objects (e.g.,

image files or MIDI files) in cyberspace through a Universal Resource Locator (URL), or create new ones from different supporting tools, such as static painting, writing an essay or composing music. We use the XML format to describe the multimedia objects and their temporal, spatial relationship metadata because of XML's high extensibility and flexibility (W3C, 2004; Villard, Roisin, & Layada, 2000). Students can resume their work at other places. They don't have to worry about data integrity or the presentation consistency of the unfinished work deposited in the server. At any stage, current piecework can be played out with synchronization to preview the result.

Research has indicated that both competence and confidence are keys to the success of active learning (Koutra, Kastis, Neofotistos, Starlab, & Panayi, 2000; Jeremy, Roy, Christopher, Douglas, & Barbara, 2000). Experimental results show that our present work enforces the highly interactive creation process, which involves acts of media creating and further authoring – an approach that leads to personal competence. Moreover, playing composite multimedia work with a synchronized manner and sharing the great work with friends reinforce personal confidence.

## SYSTEM FRAMEWORK

Figure 1 illustrates the proposed framework over existing web architecture, which is basically a client-server architecture: clients for authoring and presentation, servers for metadata storage and format exchange. The customized multimedia authoring and presentation program will be downloaded from the server into the client's browser and automatically executed. The program should provide users (e.g.,

students, teachers, experts and others) with most friendly multimedia-authoring functions and presentation experiences. All the authoring results will be transmitted to the server for storage and sharing. The server-side application gateway should maintain the meta-information of the composed, submitted artwork and handle the content exchange necessary for a different presentation tool (e.g., SMIL player). The XML-based metadata describing how different sources of media objects are composed mainly consists of three types of information: the URL of media objects (where to locate them), temporal information (when to display them) and spatial information (where to place them). The rendering function of the presentation program needs those metadata to make a best performance to users. With the help of Web technology, the framework can easily reuse a variety of existing multimedia object resources (such as images, video and audio URLs) which need not be stored in the server.

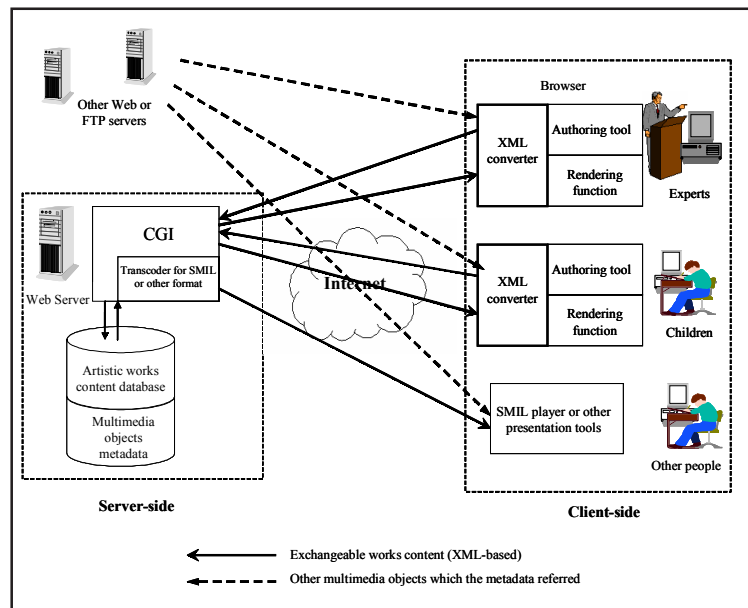
**ENABLE CHILDREN TO BE INTERESTED IN THE SYSTEM**

The environment and tools supported by the system may help children to cultivate their art capacity. However, how to attract children to use them ac-

tively is an important topic: It decides whether the system is worthy. We apply the following guidelines that can attract children to join this site actively.

1. Children's works should be able to be shared and viewed easily. Because it is an environment where everyone can learn through viewing other people's work, the Web site exhibits all the works created by children. Children can send their work as an e-card to relatives and friends. Through this Web-based system, people can see their works anywhere, anytime. (Bandura, 1986)
2. Children can get feedback about their work from others. Art appreciation is sometimes subjective. Many people may have different answers to the question "Is this piece a good work?" Everyone wishes to get feedback from other people, especially positive comments. For this reason, some experts in the arts are invited as online reviewers who, from time to time, examine online works and comment on them through Web interface or e-mail. (Skinner, 1968; Bandura, 1986).
3. An online contest with voting encourages children to perform. We encourage registered students to take part in an e-card contest on the basis of some specific topics. In addition to reviewers, Web visitors can vote for the work

*Figure 1. The Web-based multimedia authoring and presentation framework*



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