

## **PROPOSAL FOR STRATEGIC INITIATIVE GRANT**

**Project Title:** Learning Objects and Media Education for the 21<sup>st</sup> Century

**Project Category:** Strategic Initiative Grant

### **Principal Investigators:**

Dr. Magali Carrera  
Professor of Art History/Team Leader, CITS/Instructional Development  
Department of Art History  
UMass Dartmouth: mcarrera@umassd.edu or 508-999-8552

Co-Principal Investigator: Don King  
Internet Development Manager/Web Master, Web Design and Development  
Computing and Information Technology Services (CITS)  
UMass Dartmouth: dking@umassd.edu or 508-999-8575

**Campuses and Disciplines Involved:** The project will involve these academic disciplines at UMass Dartmouth: Chemistry/Biochemistry, Design, Foreign Literature and Languages, Medical Laboratory Science; as well as the Carney Library and the Instructional Development and Web Design and Development teams within Computing and Information Technology Services.

### **Participants:**

**Scott Ahrens, Assistant Professor**  
Department of Design,  
UMass Dartmouth  
sahrens@umassd.edu

**Carlos Benavides, Associate Professor of Spanish and Linguistics**  
Department of Foreign Literature and Languages  
UMass Dartmouth:  
cbenavides@umassd.edu

**Harvey Goldman, Chancellor Professor of Visual Design**  
Digital Media Program  
UMass Dartmouth:  
hgoldman@umassd.edu

**Susan J. Leclair, Chancellor Professor**  
Department of Medical Laboratory Science  
UMass Dartmouth:  
sleclair@umassd.edu

**Michele Mandrioli, Professor, Alan Bates, Professor, Toby Dills Chancellor Professor, James Golen, Professor, Timothy Su, Chancellor Professor**  
Department of Chemistry and Biochemistry  
UMass Dartmouth:  
mmandrioli@umassd.edu  
abates@umassd.edu  
tdills@umassd.edu  
jgolen@umassd.edu  
tsu@umassd.edu



## **UMass Strategic Initiative Grant: Learning Objects and Media Education for the 21st Century**

### **2. Project Narrative: Learning Objects and Media Literacy Skills**

This project explores new opportunities for building multi-layered learning and effective learning environments through the development of learning objects, which are web-based, self-contained learning units. Learning increasingly takes place in diverse environments, and learning objects are accessible, adaptable and flexible in any place of learning. Learning objects, however, are not new resources on the pedagogical landscape nor is the idea of a repository for these learning resources (e.g., Wisconsin Online Resource Center). UMass Dartmouth's project, however, differentiates itself by its awareness of and integration with the recent media literacy research, which recognizes that media environments are altering our understanding of literacy. As a result, students need to develop habits of mind and ways of processing information that are distinct from previous generations. Thus, we propose to develop learning objects that deliver their content by addressing 21<sup>st</sup> century media literacy skills.

**What is a learning object?** Learning objects contain content that is small enough to be embedded in a learning activity, are portable and can be used in multiple learning environments and across disciplines. Types of learning objects might include assessments, simulations, drills and practices; their formats can be diverse, such as video, PowerPoint, Flash, animations, mp3 files. An example of a learning object would be a short video of a chemical reaction. Once produced, such a learning object could be shared within a department (for example, a lab demonstration could be used by teachers of Chemistry) or across disciplines (Nursing and Medical Lab Science could also share the object). Depending on a course's learning objectives, students could access this learning object repeatedly.

**Rationale:** Participants conceptualize this project in the context of national conversations about teaching and learning. In October 2006, the MacArthur Foundation announced a research initiative focused on understanding the impact of widespread use of digital media on children and young adults and how they learn. Preliminary results identify the emergence of a "participatory culture," whose forms include affiliations (Facebook, MySpace), expressions (video making, zines, modding, mashups) [See glossary], collaborative problem-solving (Wikipedia) and circulation (podcasting). Supporting basic skills of reading and writing, this research also recognizes that core media literacy skills are required by this culture.

Research indicates that these skills include: *Play*, the capacity to experiment with one's surroundings as a form of problem solving; *Performance*, the ability to adopt alternative identities for the purpose of improvisation and discovery; *Simulation*, the ability to interpret and construct dynamic models of real-world processes; *Appropriation*, the ability to meaningfully sample and remix media content; *Multitasking*, the ability to scan one's environment and shift focus as needed to salient details; *Distributed Cognition*, the ability to interact meaningfully with tools that expand mental capacities; *Collective Intelligence*, the ability to pool knowledge and compare notes with others towards a common goal; *Judgment*, the ability to evaluate the reliability and credibility of different information sources; and *Transmedia Navigation*, the ability to follow the flow of stories and information across multiple modalities (Jenkins 3-4).

Preliminary results of this research suggest that incoming college students have or are developing distinct ways of taking in and applying knowledge. Thus, as participants plan their learning objects, they will think more systematically and creatively about the many different ways they might build one or more of these skills into learning objects as appropriate to the content they are teaching. Further, participants will consult not only with technology specialists but also with Digital Media artists Harvey Goldman and Scott Ahrens to create visually strong and cohesively integrated digital multimedia learning objects. Learning objects will frequently use multimedia. For example, the chemical reaction video may have an animation inset to show the reaction at a molecular level, thus developing media skills of simulation and transmedia navigation. A role-playing exercise of students of Spanish may take place in a virtual world. Finally, all projects will develop learning objectives assessments.

### 3. Project Deliverables

This project will, of course, result in learning objects that can be shared within and across departments. In addition, UMass Dartmouth will have the necessary tools and experience for faculty from all disciplines to construct many more reusable learning objects. The server environment, computers and video camera will support ongoing development of learning objects. Tentatively, we plan to use the out Luna software to catalogue and search the learning objects. Further, assessment of learning results will be used for conference presentations and to refine continued development of learning objects.

### 4. Dissemination of Project Results

We propose to demonstrate the project at UMD’s annual Teaching and Learning conference in January 2008. In addition, the group will present at UMass conferences as appropriate.

### 5. Project Budget

Budget Item	Strategic Initiative Grant	UMassD	Total
Participant Stipend \$500.00 x 10	\$ 5000.00		\$5000.00
CITS Technical Asst		\$5,000.00	\$5000.00
Technical assistance for faculty (student assistants):	\$3800.00		\$3800.00
SAN Storage	\$4000.00	\$4000.00	\$8000.00
Mac Pro Development Workstation & Monitor	\$5000.00 (workstation)	\$1000.00 (monitor)	\$6000.00
Video Camera: Canon XL2 3CCD	\$4000.00		\$4000.00
Black Pro Tripod	\$450.00		\$450.00
Instructional Software		\$1000.00	\$1000.00
Mac Laptop	\$2700.00		\$2700.00
<b>Total</b>	<b>\$24,950.00</b>	<b>\$11,000.00</b>	<b>\$35,950.00</b>

### Budget Rationale

Following the SAT Academic Technology for Teaching and Learning Vision and Plan’s 2005 call for strong “*Infrastructure and support for effective learning environments,*” this project requires the careful coordination of hardware with the diverse leading edge

technology required by the different participants, such as Comtasia, audio, and multimedia software. The project requires a professional digital quality video camera and tripod to support the production of lectures, demonstrations, lab work and PowerPoint clips. Clear sound, a sharp picture, mobility as well as compatibility with current editing software are very important. Existing equipment is under a heavy volume of use for current UMD needs; a camera/tripod dedicated to this project is necessary. Additional storage in the Storage Area Network (SAN) is required to provide the extensive capacity and processing power needed to properly host and stream detailed and complex learning objects. The Mac Pro development workstation is required for high-end multi-media development and video rendering, and to support virtual reality simulation and creation software. The Mac laptop is required for student assistants to meet with faculty in the development and testing of learning objects. Computing and Information Technology Services (CITS) will donate professional staff time to provision the space in the SAN, as well as for continued server maintenance and for supervision of student assistants. Additionally, CITS will donate instructional software, the cost of the Mac Pro monitor and will share the cost of the additional disk space (SAN) required by the project. Student assistants will work with faculty to prepare and render content.

## 6. Project Timetable

May 2007	<i>Thinking about Media Literacy</i> One-day seminar to support common readings and exchange. Identify content and media skills to be addressed.
June – July 2007	* Outline LO (learning object) content. * Work with media specialist to identify appropriate formats and software. * Develop assessment of learning rubrics.
August – November 2007	* LO production. * Begin to work on server configuration, access protocol.
January 2008	Presentation of work at UMassD Teaching and Learning conference.
January – May 2008	* LO testing in Spring 08 courses. * Further editing as required.
April 2008	* Presentation to UMass community.

## 7. Principal Investigator, Participants and Qualifications

*Participants are presenting a sampling of the ideas under consideration. Specific projects will be fully defined as we come together as a team to exchange readings, work with technical specialists and identify appropriate format and media skills.*

### **Scott Ahrens, Associate Professor of Visual Design, Digital Media Program**

A series of virtual environments for students learning about the architectural, symbolic and cultural significance of sacred sites from around the world will be developed. These learning objects will be experienced in single-user virtual reality simulations as well as multi-user online worlds. The synthetic environments will combine many types of digital media including 3D space, sound, animation and interactive encounters to create an immersive multi-channel learning environment. Prof. Ahrens will also work as an electronic

media design consultant to help other researchers with their projects. Sample work:  
<http://www.des.umassd.edu/sahrens/sahrens/contact.html>

**Carlos Benavides, Associate Professor of Spanish & Linguistics, Department of Foreign Literature and Languages**

Interactive “information gap” activities in Spanish will be developed. An information gap activity is a communicative task in which two or more learners work cooperatively to fill out a chart or answer a set of questions, each learner contributing information from a “gap sheet” (a text or picture) the other has not seen. The “gap” makes reference to information that one learner has but others do not. In this learning object, the computer would play the role of one of the learners, would make the gap sheets available to itself and to the other learner(s), and would provide the necessary instructions to complete the task. Information gap activities can be developed for any topic covered in a language class, such as shopping, scheduling, and travel planning.

**Magali Carrera, Professor of Art History, Team Leader, Instructional Development**  
Project instructional oversight will be managed through Instructional Development.

**Harvey Goldman, Chancellor Professor of Visual Design, Digital Media Program**

A series of tutorials (learning objects) for students learning about 2D computer animation will be developed. These learning objects will manifest themselves in the form of Flash and QuickTime movies. They will include "how to" screen captured movies, as well as reference material in the form of stills and movies. These learning objects will also incorporate voice-overs. Prof. Goldman will also work as an electronic media design consultant to help other researchers create visually strong learning objects. Sample work:  
<http://www.harveygoldman.com/animations/RetinaRegeneration.htm>

**Donald King, Internet Development Manager/Web Master, Web Design and Development, CITS**

Project technical oversight will be managed through Web Design and Development.

**Susan J. Leclair, Chancellor Professor, Department of Medical Laboratory Science**

Learning objects will assist students to develop manipulative skills. Using video and/or animations embedded in class web pages, the students will see demonstrations of correct skill development in a virtual laboratory. The subspecialties of clinical laboratory science, cytotechnology and biotechnology would be included in this project. Additional graphical presentations could be used to demonstrate incorrect technique. Animation frames of these tutorials may then be used in an online quiz setting, which would prepare the student for actual laboratory exercises. In addition, the development of a series of videos will be explored: cases of medical ethics interest. Students would view a case and prepare a fully developed line of reasoning as an improvement on written synopses that often lead to simple reactions and conclusions.

**Matt Sylvain, Assistant Reference/Instruction Librarian, Claire T. Carney Library**

A series of tutorials that teach students how to effectively search the ERIC, a database of education articles and documents, will be developed. This series will demonstrate how to

search ERIC using both the EBSCO Host interface as well as the Department of Education's open access interface. The tutorials will include a visual component with an accompanying voiceover. An assessment component will evaluate key learning objectives.

### **Department of Chemistry and Biochemistry [will work as a group]**

- **Michele Mandrioli, Professor**

Learning objects will include "Introduction to Statistics for Chemistry Lab" (Excel-based). The interactive online "Review Quizzes" and/or review questions with "pop up" answers will be further developed. Video "screen shots" and audio explanations of the methods of performing the relevant manipulations, setups and calculations will be added. These will be used in lower-level chemistry lab courses, but modules extracted from them (basic statistics and Excel topics) would be more generally useful in a wide range of disciplines.

- **Alan Bates, Professor; Toby Dills, Chancellor Professor; James Golen, Professor; Timothy Su, Chancellor Professor**

Learning objects will include the videotaping of demonstrations used to illustrate concepts in lower-level chemistry courses. The videos will be augmented by a simulation of the reaction involved. The proposed format for these demonstrations allows ideas to be illustrated not only on the macro and micro scale, but also in a conceptual manner that would assist in the development of working scientific models. Example: Physical and Chemical Reactions: Helium, hydrogen, and hydrogen + oxygen balloons: Helium and hydrogen balloons are burst with a candle, in order indicated, to illustrate physical and chemical changes. Balloon filled with hydrogen and oxygen mixture is then ignited with a candle to illustrate chemical reaction if appropriate stoichiometry is used. Reaction:  $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$

### **Works Cited**

Jenkins, Henry. "Confronting the Challenges of Participatory Culture: Media Education for the 21<sup>st</sup> Century." *Building the Field of Digital Media and Learning*. MacArthur Foundation. 10/19/2006  
<<<http://www.digitalllearning.macfound.org/site/c.enJLKQNIFiG/b.2029245/k.C5DF/Results.htm>>>. 02/15, 2007.  
Wisconsin Online Resource Center. << <http://www.wisc-online.com>>> 02/15/2007

### **Glossary**

zine: self-published publication of small circulation, non-commercial work of original or appropriated texts and images

modding: modification of a software or hardware to perform a function not intended by someone with legal rights concerning that modification.

mashup: a song, video or a website or web application that combines content from more than one source