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ILS 655

Digital Library Project Review Paper 01

February 6, 2010

Harvard-Smithsonian Center for Astrophysics – Digital Video Library

http://hsdvl.org/

Project Background:

The Harvard-Smithsonian Center for Astrophysics – Digital Video Library supports K-12 STEM (science, technology, engineering and math) education reform and has been developed by the Science Media Group, part of the Science Education Department at the Harvard-Smithsonian Center for Astrophysics. Matthew Schneps, the principal investigator, was awarded $929,992 in September of 2002 to complete the project. The estimated expiration of the award was in November of 2004. Co-funding of the project was provided by the Office of Multidisciplinary Activities in the NSF Directorate for Mathematical and Physical Sciences.

The mission of the project was to assemble and manage a collection of STEM digital video materials produced by the Harvard-Smithsonian Center for Astrophysics. The goal was to take over 3,500 hours of video footage from well-known television programs as well as professional development materials and create a digital library indexed through a searchable database. The end product consists of a library of more than 1,000 movies, 350 hours of digital video, that support STEM education.

Those working on the project reviewed the entire Harvard-Smithsonian Center for Astrophysics' digital video collection, spanning almost 15 years in the making. Materials were tagged according to their applicability to standards-based learning. The collection was also catalogued in a way that teachers and educators were able to search the collection by STEM discipline, age

level, or content area. The digital video library was also linked to the National Science Education Standards, AAAS Benchmarks (The American Association for the Advancement of Science), as well as state and local standards. Advisors from the NSDL (United States' National Science Digital Library) Core Integration program also ensured metadata and formats conformed to related efforts of the NSDL.

Organization of Resources:

The digital library contains four categories of video: clinical interviews, demonstrations of phenomena, case studies of instruction or research and interviews with experts.

Clinical interviews with children and adults cover a vast array of topics and reveal how learners process scientific ideas. For instance, "Can We Believe Our Eyes?" describes the notion that students with prior knowledge and beliefs will often retain those beliefs even when presented with new information from the teacher. The video goes on to explain how new research is changing the way information is presented in the classroom. The collection also contains interviews with experts in STEM research or education. Scientists, teachers, teacher educators, and education researchers share their contributions to the field of science. Interviews with students reflecting on their own STEM learning also provide an interesting perspective.

Demonstrations of phenomena are also a great resource for both students and teachers. Time lapse movies of the motions of stars and of a decomposing apple, computer animations of molecules in photosynthesis, and live active demonstrations of balls rolling on inclined planes provide an engaging and invaluable experience for students.

Extensive footage also documents the process of teaching in action. The Case Studies in Science Education Project follow two dozen teachers at different points in their careers, documenting their teaching for as long as two years. Examples of master teachers at work during class lessons provide an inside look at best practices. The collection also contains examples of research in science and education.

Service Features:

Users may search the collection by selecting one of six options: *By AAAS Benchmarks, Using Strand Map, By Other Standards, Relating to Instruction¸Using any Criterion,* or *View All.*

Educators may prefer the *By Other Standards* option where science and math standards (National Science Education Standards and Principles and Standards for School Mathematics) are clearly

listed by state. The *Relating to Instruction* option allows users to search the collection by selecting one of seven instructional categories. For instance, selecting *Promoting Student Thinking* as the instructional category reveals three criteria. Users may narrow their search by selecting one and then submitting their request. A quick search option is also available on each page of the digital library.

Searching *Using Strand Map* offers the opportunity to search the library for videos related to the *Atlas of Science Literacy*. *Atlas of Science Literacy* is a "two-volume collection of conceptual strand maps that-and commentary on those maps- that show how students' understanding of the ideas and skills that lead to literacy in science, mathematics, and technology might develop from kindergarten through 12th grade." (http://www.project2061.org/publications/atlas/default.htm) This information may be viewed as a graphical strand-map interface in PDF format, as a list of chapters and maps in *Atlas of Science Literacy*, or as a graphical strand-map interface in Scalable Vector Graphics (SVG) format. Providing educators with strand maps aids in greater understanding of benchmarks and standards, developing and evaluating curriculum materials, and constructing and analyzing assessment.
(http://www.project2061.org/publications/atlas/default.htm)

On the search results page, users may view up to ten results at one time. For each result, users may view the title of the clip, read a brief synopsis and view a thumbnail of the video. Each result also lists the search category that has been assigned to the video. Selecting a link brings the user to a new page where the video can be viewed. The video title, a brief clip description, and other standards can also be found on this page. A transcript of the video is also available in

a PDF file. A *Back to Search Results* arrow returns users to the previous page.

Technologies:

On the site's homepage, users may select an option to learn more about the system requirements. The site requires two browser plug-ins for full functionality. Links to install Windows Media Player (and Flip4Mac with Quicktime) and Adobe Reader are made available through the site. Users may also select to take a video tour of the site; however, this function was disabled at the time this paper was being written. There is evidence of xml code on the source pages.

Analysis:

The Harvard-Smithsonian Center for Astrophysics – Digital Video Library contains a wealth of

information for both pre-service elementary and secondary teachers as well as seasoned educators. The alignment with national and state standards and links to AAAS Benchmarks provides teachers with a critical tool to assist in lesson planning and curriculum development. Furthermore, the material is representative of the current state of teaching and learning and is research based. Many of the videos feature teachers explaining their instructional decisions in addition to providing feedback on student learning. This element is especially useful to beginning teachers. One of the disappointing aspects that this review revealed is that the video tour function no longer works. It appears as though regular maintenance of the site, perhaps due to cost concerns, no longer occurs. This video tour would give users important feedback and direction on how to best utilize the site's features.

Bibliography

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