



DIGITAL LIBRARIES

Curriculum Development

NSF Annual Report 2008:

Collaborative Research:

Curriculum Development: Digital Libraries

Funded by NSF through Virginia Tech (VT) grant IIS-0535057 and University of North Carolina at Chapel Hill (UNC-CH) grant IIS-0535060

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PI (UNC-CH): Barbara M. Wildemuth

Co-PI (UNC-CH): Jeffrey P. Pomerantz

Date: January 1, 2009

Note: An interim report was filed on 10/24/2008. Our request for one year no cost extension was submitted on 11/25/2008 and approved by 12/23/2008, giving a project end date of 12/31/2009. Due to Fastlane constraints, it was not possible to submit a 3rd year report (which this constitutes) until after the no cost extension was approved, hence our turning in this report only now.

1. *Project Participants*

1.1 People working directly on the project

- Project Team at VT:
 - PI: Edward A. Fox
 - GRA: Seungwon Yang
- Project Team at UNC-CH:
 - PI: Barbara M. Wildemuth
 - Co-PI: Jeffrey P. Pomerantz
 - GRA: Sanghee Oh

1.2 Other organizations involved as partners

1.3 Other collaborators or contacts

- Volunteers involved in module development or review (including Advisory Board members and new people joining Advisory Board meetings)
 - Suzie Allard, University of Tennessee
 - Bob Allen, Drexel University

- Nick Belkin, Rutgers University
- Rob Capra, University of North Carolina
- Hugh Cayless, University of North Carolina
- Sally Jo Cunningham, University of Waikato, New Zealand
- Allison Druin, University of Maryland
- Helene Francke, University College of Boras, Sweden
- Vicki Gregory, University of South Florida
- Jane Greenberg, University of North Carolina
- Stephanie Haas, Univ of North Carolina, Chapel Hill
- Trudi Bellardo Hahn, University of Maryland
- Brad Hemminger, Univ of North Carolina, Chapel Hill
- Ingrid Hsieh-Yee, Catholic University of America
- Joe Janes, University of Washington
- Jim Jansen, Penn State University
- Judy Jeng, New Jersey City University
- Pratik Karia, Virginia Tech
- Diane Kelly, University of North Carolina
- Mick (Michael) Khoo, Drexel University
- Stacy Kowalczyk, Indiana University
- Cal Lee, University of North Carolina
- Michael Lesk, Rutgers University
- Elizabeth Liddy, Syracuse University
- Lili Luo, San Jose State University
- Michael Lynch, Middlebury College
- Steven MacCall, University of Alabama
- Gary Marchionini, University of North Carolina, Chapel Hill
- Jerry McDonough, University of Illinois, Urbana-Champaign
- Lorraine Normore, University of Tennessee, Knoxville
- Claudia Perry, Rutgers University
- Tefko Saracevic, Rutgers University
- Candy Schwartz, Simmons College
- Natasha Smith, University of North Carolina
- Nguyen Hoang Son, Hue University, Vietnam
- Shigeo Sugimoto, University of Tsukuba, Japan
- Pertti Vakkari, University of Tampere, Finland
- Ruth Vondracek, Oregon State University
- Tom Wilson, University of Sheffield, England (retired)
- Meredith Weiss, University of North Carolina
- Ian Witten, University of Waikato, New Zealand
- Hong (Iris) Xie, University of Wisconsin, Madison
- Eun-young Yoo, North Carolina Central University
- Additional colleagues with whom we have consulted:
 - Helen Tibbo, University of North Carolina, Chapel Hill
 - Cal Lee, University of North Carolina, Chapel Hill
 - Carol Perryman, University of North Carolina, Chapel Hill

- Orion Pozo, North Carolina State University
- Larry Taylor, University of North Carolina, Chapel Hill
- Ian Witten, University of Waikato, New Zealand
- Marcos André Gonçalves, Universidade Federal de Minas Gerais, Brazil
- Advisory Board members
 - See listing at <http://curric.dlib.vt.edu/advisory/advisory.html>.

2. *Activities and Findings*

2.1 Major research and education activities

Project team meetings held

The project team met together on two occasions during the past year:

- January 4, 2008, at UNC, with particular focus on the possibilities of extending this work into Second Life (guests: Perryman, Pozo, Taylor)
- May 27, 2008, at UNC, including lengthy discussions of sustainability and broadening participation in the initiative

In addition, we augmented face-to-face meetings with phone- and video-conferences (including in the latter part of the year with Adobe ConnectPro), held on April 2, July 29, August 12, August 29, September 6, September 19, October 3, October 10, October 24, and November 21.

These project meetings were essential for closely coordinating our other activities. They were supplemented throughout the year by frequent email discussions, and many local face-to-face meetings at each project site.

Advisory Board meetings/activities

The full list of Advisory Board members is available at <http://curric.dlib.vt.edu/advisory/advisory.html>. We convened the Advisory Board, joined by several other scholars and practitioners, during the annual meeting of the American Society for Information Science & Technology, in Milwaukee on October 27, 2007; 10 members and invitees were in attendance. We met with the project Advisory Board again during the Joint Conference on Digital Libraries, in Pittsburgh, June 18, 2008; 14 members and invitees attended. Our last meeting of 2008 was in Columbus on October 28 at the ASIS&T Annual meeting; 13 members and invitees attended. The discussion at all of these meetings focused on ways to form a sustainable community of DL scholars and practitioners.

Development of the curriculum framework

By the end of the project's second year, the curriculum framework was reasonably stable. Even so, as we've developed more of the individual modules in the framework, we have continued to identify new modules to add to the framework, including modules on

Images (2-b1), Web publishing (3-e/7-e), Crawling (3-f/7-f), Information visualization/summarization (6-e), and Image retrieval (7-a1).

Module development

Work on developing specific modules within the curriculum framework has continued to progress this year. The template being used for each module is available at <http://curric.dlib.vt.edu/~dlcurric/Template.2008-10-03.pdf>. Details of our progress in this work are provided below in section 2.2.

Module review

Ten modules were reviewed by external experts this year. The reviews involved 32 experts outside the project team. Their comments were recorded/shared on the project's wiki, established for this purpose. Because of the wiki, the reviewers' comments were available to each other, and the evaluation process could be more interactive. The results from these reviews were incorporated in the modules.

Module field testing

Once modules have been reviewed by experts, they are ready for field testing. The field testing procedures include the implementation of the module in a course related to digital libraries, interviewing the instructor about the modifications made to the module as it was implemented and about the usefulness of the module, and surveying the students about the effectiveness of the module for supporting their learning.

Field testing of five modules in four classes was completed in spring and summer 2008. In fall 2008, ten modules are being field tested in three classes. Details of the field testing are described below in section 2.2.

Starting in early December 2008, we invited many others to join in the field testing. In particular, we sent emails with subject "Invitation to participate in DL curriculum module field test" to the jesse listserv, for LIS educators, and the ASIS&T SIG DL list.

DL textbook

The PI at Virginia Tech, Edward Fox, is working to prepare a short textbook on DLs with Marcos André Gonçalves (Universidade Federal de Minas Gerais, Brazil). It will be based on the 5S framework (a foundational theory on DLs) in accordance with our DL module framework. This short work has been invited for the Morgan-Claypool Lecture Series.

2.2 Major findings

Module development

The modules currently under development, and their status, are described in the following table.

Status of module development

ID	Title and scope	Lead developer	Status
1-b	History of digital libraries and library automation	Pomerantz	Expert review completed Feb 08; in field testing
2-a	Text resources	Oh	Under development
3-b	Digitization	Oh	Expert review completed Dec 07; in field testing
3-e/ 7-e	Web publishing	Karia	Under development
4-b	Metadata	Pomerantz/ Greenberg	Expert review completed Jul 08; in field testing
5-a	Architecture overviews/models	Fox	Expert review completed 8/08; in field testing
5-b	Applications software	Yang	Expert review completed Feb 08; first field test completed
6-a	Information needs/relevance	Wildemuth	Expert review completed Dec 07; first field test completed
6-b	Search strategy, information seeking behavior, user modeling	Oh	Expert review completed Dec 07; in field testing
6-d	Interaction design and usability assessment	Oh	Expert review completed Aug 08; first field test completed
7-a	Search engines, IR, indexing methods	Karia	Under development
7-b	Reference services	Pomerantz	Expert review completed Jan 08
8-a	Preservation	Lee/Pomerantz	First field test completed
9-a	Project management	Pomerantz	Under development
9-c	Digital library evaluation, user studies	Wildemuth	Expert review completed Jan 08; in field testing
9-e	Intellectual property	Weiss/Wildemuth	First field test completed

Module review

As shown in the table above, ten modules have been reviewed by experts. In each evaluation, three or more experts used the project wiki to provide comments related to five areas:

- Objectives: Are the objectives appropriate for the topic?
- Body of knowledge: Does the module address all areas of the topic that need to be addressed?
- Readings: Are the readings the best and most appropriate for the topic?
- Learning activities: Are the activities appropriate for the topic?
- Logistics: Is it feasible to teach the module as it is currently constructed?

The reviewers' comments are then used to improve the module prior to its evaluation in the field.

Module field testing

During spring and summer 2008, five modules were field tested in four classes. The participating instructors were: Ron Brown (Univ. of South Carolina), Cal Lee (Univ. of North Carolina), Jeff Pomerantz (Univ. of North Carolina), and Cristina Ribeiro (Faculdade de Engenharia- Universidade do Porto). The five modules are marked in the table above as “first field test completed.”

Student survey results from the spring field tests were reported at the workshop, “Education for Digital Stewardship: Librarians, Archivists, or Digital Curators?”, held at the Joint Conference on Digital Libraries, Pittsburgh, PA, June 20, 2008. Those results, plus the results from the summer field test, are presented here.

**Student survey results: Mean (standard deviation), number missing
 Field tests conducted in spring and summer 2008**

	5-b, App software n=11	6-a, Info needs n=9	6-d, Inter- action design n=8	8-a, Preserva- tion n=13	9-e, Intellectual property n=8
Clearly outlined objectives and outcomes were provided. ²	3.3 (0.5)	2.2 (1.2) <i>msg=1</i>	3.6 (1.1)	2.8 (0.7)	2.4 (1.1)
The module was well-organized. ⁴	2.9 (0.3)	2.6 (0.9)	3.3 (1.2)	2.8 (0.6)	2.4 (1.1)
The amount of work required for this module was appropriate. ⁴	2.5 (1.0)	3.1 (0.7) <i>msg=2</i>	3.1 (1.2)	2.7 (0.7) <i>msg=4</i>	2.9 (0.4) <i>msg=1</i>
The assigned readings helped me better understand the subject matter. ⁴	3.3 (0.5)	2.4 (0.5)	3.5 (0.8)	2.9 (0.6) <i>msg=3</i>	2.4 (1.1) <i>msg=1</i>
Given the module's objectives, the learning activities and/or assignments were appropriate. ⁴	3.0 (0.6)	2.7 (0.5) <i>msg=1</i>	3.6 (0.7)	2.6 (0.9) <i>msg=4</i>	2.4 (1.1) <i>msg=1</i>
The learning activities and/or assignments required thinking and understanding. ¹	3.2 (0.6)	2.6 (0.7) <i>msg=1</i>	4.1 (0.4)	2.9 (0.4) <i>msg=5</i>	3.0 (0.6) <i>msg=2</i>
The learning activities and/or assignments were stimulating. ³	2.9 (0.5)	2.2 (0.9) <i>msg=1</i>	4.1 (0.6)	2.9 (0.8) <i>msg=4</i>	3.3 (0.5) <i>msg=2</i>
Assignments for this module helped me understand what will be expected of me as a professional. ³	2.4 (0.8)	2.3 (0.8) <i>msg=3</i>	2.9 (1.0)	2.5 (0.7) <i>msg=3</i>	2.4 (0.5) <i>msg=3</i>
I learned useful professional skills from this module. ¹	2.8 (0.4)	1.9 (0.8)	3.0 (1.0)	2.5 (0.8)	2.7 (0.8) <i>msg=1</i>
I know significantly more about this subject than before I took this module. ⁴	3.1 (0.7)	1.7 (0.9) <i>msg=1</i>	3.4 (1.1)	2.9 (0.9)	2.5 (1.2)
Class lectures added to my understanding of the subject. ¹	3.0 (0.6)	2.7 (0.7)	3.4 (0.7)	3.2 (0.4)	2.7 (1.2)
I gained a good understanding of the basic concepts related to this subject. ²	3.1 (0.3)	2.9 (0.6)	3.9 (0.8)	3.2 (0.6)	2.6 (1.1)
I learned to interrelate important issues related to this subject. ²			3.5 (0.5)		
This module stimulated me to think critically about the subject matter. ⁴			3.6 (0.9)		
I feel that this learning module served my needs well. ²			3.0 (1.2)		
I was very satisfied with this learning module. ²			3.0 (1.2)		
Overall, considering its content, design, and structure, this module was effective. ⁴			3.3 (1.2)		

1 = Strongly disagree, 5 = Strongly agree

Sources of items: ¹ From Snare (2000) ³ From Flashlight ² From McGorry (2003) ⁴ From Neal (2004)

Note: In the initial administrations of the survey, some items were inadvertently omitted. All the items are being included in surveys conducted summer and fall 2008.

These data will be analyzed further, compared with the results of this fall's field testing, and discussed in appropriate publication venues, such as in the proceedings of the Joint Conference on Digital Libraries (JCDL) and the publications of the American Society for Information Science & Technology (ASIS&T).

2.3 Opportunities for training/development provided by the project

The project team consists of two full professors (one at each institution), one assistant professor (at UNC), and two graduate research assistants (one at each institution). Each of the team members has increased their research skills and experience through this project, as well as gained insights into curriculum development in the area of digital libraries.

During 2008, the research assistants have been primarily involved in three areas: developing draft modules; managing the expert review process; and managing the field testing. Seungwon Yang, at Virginia Tech, was responsible for developing the module on Applications software and provided the initial draft of the module on Architecture overviews. In addition, Seungwon has been responsible for the project website and wiki (used in the expert reviews). These responsibilities have increased his knowledge of the technical aspects of digital library management, as well as allowed him to explore the ways that advanced technologies might be used to support this project and digital libraries. Sanghee Oh, at UNC, this year developed the modules on Digitization and Interaction design and usability assessment; in addition, she is currently developing a module on Text resources. She also has responsibility for managing the expert reviews and the field testing. These responsibilities have increased her knowledge of the operational aspects of digital libraries and her understanding of user behaviors, as well as increasing her social science research skills.

At Virginia Tech, in Fall 2008, 16 students took CS6604, Digital Libraries, and one other student visited/audited the class. This advanced graduate class was taken mostly by Ph.D. students. They provided considerable help related to this project, and also learned a great deal. The class had 4 teams, each presenting 2 of the modules, across 2 class sessions. Thus, 8 weeks of the class dealt with students presenting 8 modules (3-b, 4-b, 5-a, 5-b, 6-a, 6-b, 6-d, and 9-c), that followed after the instructor presenting module 1-b. The team presenting each module learned that module in-depth, while the rest of the class also learned, by doing all the required reading and at least one of the exercises, as well as participating in the 2 class sessions about that module. Later in the class student teams both developed and presented 4 new modules: 2-c/8-d (File formats, transformation, migration), 5-d (Protocols), 7-g (Personalization), and 8-b (Web archiving). They learned an important skill, rarely covered for graduate students, of how to develop an educational module, and benefited from detailed feedback as they spent a full class session presenting that module (and from comments by another team assigned to give them a peer review critique).

2.4 Outreach activities

Tutorials

Fox presented 4 tutorials using the modules developed for the project:

- Introduction to (Teaching / Learning about) Digital Libraries. 1/2 day tutorial scheduled for JCDL 2008, Pittsburgh, June 19, 2008
- Introduction to (Teaching / Learning about) Digital Libraries. Half-day tutorial, ICADL 2007, Dec. 10, 2007, Hanoi
- Introduction to (Teaching / Learning about) Digital Libraries. Full-day tutorial (part 1, part 2), ECDL 2007, Sept. 16, 2007, Budapest
- Introduction to (Teaching / Learning about) Digital Libraries. Half-day tutorial, ECDL 2006, Sept. 17, 2006, Alicante, Spain

Workshops

- Fox, E.A., & Wildemuth, B.M., participants, "Education for Digital Stewardship: Librarians, Archivists, or Digital Curators?" Joint Conference on Digital Libraries, Pittsburgh, PA, June 16-20, 2008.

Invited presentations and panels

- Molly Bragg, Edward A. Fox, Margaret Hedstrom, Christopher A. Lee. (2009). Moving Web Archiving into the Classroom. Panel accepted to be presented at DigCCurr2009: Digital Curation Practice, Promise and Prospects, April 1-3, 2009, Chapel Hill, NC. (<http://www.ils.unc.edu/digccurr2009/>)
- Wildemuth, B.M., Pomerantz, J., Oh, S., Yang, S., & Fox, E.A. (2008). Preliminary results from field testing of DL curriculum modules. Paper presented at the workshop, "Education for Digital Stewardship: Librarians, Archivists, or Digital Curators?", Joint Conference on Digital Libraries, Pittsburgh, PA, June 16-20, 2008. http://curric.dlib.vt.edu/DLcurric/JCDL2008_workshop_eval_slides.pdf.
- Pomerantz, J.P. (2008). Designing, developing, and evaluating an interdisciplinary digital library curriculum. Invited keynote presentation, Libraries in the Digital Age, Dubrovnik, Croatia, June 4, 2008. http://curric.dlib.vt.edu/DLcurric/Pomerantz_LIDA2008.ppt.
- Wildemuth, B.M. (2007). Bringing your library into view. Presented at Jinonice Monday's, Institute of Information Studies and Librarianship, Charles University, October 1, 2007. <http://curric.dlib.vt.edu/DLcurric/JinoniceInfoMondays.Prague2007.pdf>.

3. Publications and Products

3.1 Publications

- Yang, S., Wildemuth, B.M., Pomerantz, J.P., Oh, S., & Fox, E.A. (2008, in press). Core topics in digital library education. *Handbook of Research on Digital Libraries: Design, Development, and Impact*. IGI Global. Publication expected February 2009.

- Yang, S., Levy, J., Miller, K., Pomerantz, J.P., Oh, S., Wildemuth, B.M., Fox, E.A. (2008). Two approaches to enhance the education for ETDs: Developing educational modules and migrating the *ETD Guide* into a community wiki. Paper presented at ETD 2008: The 11th International Symposium on Electronic Theses and Dissertations, Aberdeen Scotland, June 4-7, 2008.
<http://curric.dlib.vt.edu/DLcurric/ETD08-dlcurric-2008-05-19-final.pdf>.
- Yang, S., Wildemuth, B.M., Kim, S., Murthy, U., Pomerantz, J.P., Oh, S., & Fox, E.A. (2007). Further developments of a digital library curriculum: Evaluation approaches and new tools. *Asian Digital Libraries: Looking Back 10 Years and Forging New Frontiers, Lecture Notes in Computer Science*, 4822, 434-443.
http://dx.doi.org/10.1007/978-3-540-77094-7_55.
- Wildemuth, B.M., Pomerantz, J., Oh, S., Yang, S., & Fox, E.A. (2008). A digital libraries curriculum: Expert review and field testing. *D-Lib Magazine*, 14(7/8).
<http://www.dlib.org/dlib/july08/07inbrief.html#WILDEMUTH>.
- Pomerantz, J., Wildemuth, B.M., Oh, S., Yang, S., & Fox, E.A. (2008). Evaluation of a curriculum for digital libraries. Poster presented at the Joint Conference on Digital Libraries, Pittsburgh, June 16-20, 2008.
<http://curric.dlib.vt.edu/DLcurric/JCDLposter.2008-06-05.pdf>. Recipient of 3rd place prize in the JCDL 2008 poster competition.

3.2 Website

Project website at <http://curric.dlib.vt.edu/>. The home page provides basic contact information. Additional pages provide updates on our module development activities; a list of, and links to, project publications; a list of our Advisory Board members; and links to press coverage of the project.

3.3 Other specific products

- The up-to-date DL module framework is available at http://curric.dlib.vt.edu/DLcurric_images/ModuleFramework2008-08-23.pdf.
- Wildemuth, B. M. (2007). Bringing digital libraries into view on an individual's information horizon [video recording]. Recorded May 22, 2007.
<http://www.youtube.com/watch?v=PXjLBAmrD00&feature=Playlist&p=19189F4C412A6E09&index=92>
- Highlight submitted 12/30/08 to NSF from both VT and UNC-CH, entitled "Digital library curriculum modules now available", along with our logo and NSF Form 1515 allowing use of it

4. Contributions

4.1 Contributions to the principal disciplines of the project

This project was interdisciplinary from its inception. It is our goal that its products (the curriculum framework and modules) will bring the CS and LIS disciplines closer together

in their work on digital libraries. Specifically, the final product – a high quality DL curriculum – will produce DL researchers, designers, and administrators who understand all the necessary aspects of DL systems and services, as well as their particular DL specialty areas. The field testing of the available modules in both CS courses and LIS courses demonstrates our success in making this an interdisciplinary venture.

DLs incorporate various technologies such as database systems, information retrieval systems, advanced user interfaces, network systems, multimedia systems, recommender systems, etc. Our DL curriculum project provides students in both computer science and information and library science with opportunities to understand how each of the above technologies work and how they can interact together efficiently to support DLs.

Citations to project publications/works, from CS or ILS

In addition to the contributions to computer science and information and library science described above, our work already has begun to have an impact on the scholarly output of researchers in those disciplines, as represented by the citations listed below. (Self-citations are excluded.)

Pomerantz, J., Oh, S., Yang, S., Fox, E.A., & Wildemuth, B.M. (2006). The core: Digital library education in library and information science programs. *D-Lib Magazine*, 12(11). <http://www.dlib.org/dlib/november06/pomerantz/11pomerantz.html>.

Cited by:

- Koltay, T., & Boda, I. (2008). Digital library issues in Hungarian LIS curricula: Examples from three library schools. *Library Review*, 57(6), 430-441.
- Gonçalves, M.A., Moreira, B.L., Fox, E.A., & Watson, L.T. (2007). "What is a good digital library?" - A quality model for digital libraries. *Information Processing & Management*, 43(5), 1416-1437.
- Guy, F. (2007). Technological advances and information education, 1982-2007: Some perspectives. *Education for Information*, 25, 63-72.

Digital Library Curriculum Project home page (<http://curric.dlib.vt.edu/>).

Linked to by:

- ECDL 2007: Budapest, Hungary. <http://www.ariadne.ac.uk/issue53/ecdl-2007-rpt/>.

4.2 Contributions to other disciplines of science and engineering

Long term, our project will contribute to the other science and engineering disciplines through the work of graduates of DL programs in computer science and information and library science. Because those graduates will have a stronger education in DL development and administration, the DLs they create (in collaboration with scientists and engineers) will more effectively provide valuable knowledge for those scientists and engineers. Our contributions should lead to the overall improvement of research efficiency and the advancement of any discipline that relies on digital libraries.

At VT, a multi-disciplinary curriculum building project called, LIKES (Living In the KnowlEdge Society), has been launched by the scholars in the areas such as Business and Information Technology, Computer Science, etc. Based on the DL module framework concept, pluggable LIKES modules can be developed to enhance computing education as well as core / liberal arts education. This relates directly to the LIKES collaborative award to VT (lead institution – NSF CCF CPATH 0722259) – and partner sites (grants 0722276, 0722289, 0752865) to Villanova, U. Texas El Paso, and NC A&T.

VT also is part of a six-partner collaboration, supported by NSF DUE grants 0840713, 0840719, 0840721, 0840668, 0840597, and 0840715 – for “Ensemble: Enriching Communities and Collections to Support Education in Computing”. A \$2.5M NSDL Pathways award made 9/15/2008 will allow this team to enhance education in all areas related to computing, in connection with the National Science Digital Library. DL curricular materials will fit well into the evolving collection for Ensemble, made accessible through the portal that VT will run.

At UNC, we have been cooperating with a digital curation curriculum development project, funded by the Institute for Museum and Library Services and directed by Helen Tibbo and Cal Lee. They have adopted our template for development of individual modules and Cal Lee developed a draft module on Preservation for our project. We expect to continue to collaborate with this group in the many ways in which our efforts are synergistic.

4.3 Contributions to the development of human resources

Courses created by this project will provide an improved learning experience to graduate-level students and current DL designers and administrators, increasing the possibility of improving their job performance and growth. During field testing, the modules have already affected the learning of over 120 students at five universities.

4.4 Contributions to the physical, institutional, or information resources infrastructure

Just as this project is expected to develop human resources through improved education of DL professionals, it also is expected to contribute to the development of more effective DLs. As graduates of programs using our curriculum framework and/or modules enter the workforce, they will be able to design, build, and administer digital libraries more effectively.

4.5 Contributions to other aspects of public welfare

DLs can be developed for many purposes, each benefiting the public welfare. For example, a DL that holds data about a community’s infrastructure and resources could provide critical information during an emergency, or to aid in recovery afterwards – thus, VT has been working on a related project (NSF SGER: DL-VT416: A Digital Library Testbed for Research Related to 4/16/2007 at Virginia Tech, PI: Edward A. Fox; Co-PIs: Weiguo Fan, Christopher North, Naren Ramakrishnan, Donald Shoemaker). Use of a

well-designed and well-managed digital library can lead to improved methods and reduced cost for helping those involved in such situations, whether for research, support of scholarship at all levels, or for public assistance (including recovery and healing after tragedies and crises). Our curriculum development project will contribute to the public welfare by producing DL experts who can design and administer such DLs.