THE COMPREHENSIVE PROGRAM
FUND FOR THE IMPROVEMENT OF POSTSECONDARY EDUCATION

TITLE PAGE

Check one: Preliminary Proposal ___ Final Proposal __x__

This application should be sent to: 1. Application Number
No. 84.116A
U.S. Department of Education
Application Control Center
Room 3633, ROB-3
Washington, D.C. 20202-4725

2. D-U-N-S Number
003137015

3. Project Director (Name and Mailing Address) 4. Institutional Information
Edward A. Fox
Dept. of Computer Science
660 McBryde Hall, M/C 0106
Virginia Tech
Blacksburg, VA 24061

 Highest Degree Awarded: Type:
_____ Two-year  _____ Public
_____ Four-Year  _____ Private
_____ Graduate  _____ Doctorate
_____ Non-degree granting

Telephone: 540-231-5113
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E-mail: fox@vt.edu

5. Federal Funds Requested: 6. Duration of Project:
1st Year $150,512 Starting Date 1/1/2001
2nd Year (if applicable) $152,971 Ending Date 12/31/2003
3rd Year (if applicable) $155,539
Total Amount: $459,022 Total No. of Months 36

7. Proposal Title Preparing Scholars: The Graduate Student Development Initiative & Open Archives Initiative

8. Brief Abstract of Proposal: We will launch a nationwide Graduate Student Development Initiative to better prepare graduate students for life-long learning in the Information Age, focusing on electronic publishing and digital libraries. Building upon our work on electronic theses and dissertations (ETDs) that has led to the Networked Digital Library of Theses and Dissertations, we will help graduate students to actively participate in the Open Archives Initiative, that aims to integrate all scholarly archives (including ETDs and disciplinary collections).

9. Legal Applicant: (Name and Mailing Address) 10. Population Directly Benefiting from the Project:
Virginia Tech
301 Burruss Hall
Blacksburg, VA 24061-0249

Congressional District of the Applicant Institution: 9th
over 100,000 graduate students/year plus others

11. Certification by Authorizing Official
The applicant certifies to the best of his/her knowledge and belief that the data in this application are true and correct, that the filing of the application has been duly authorized by the governing body of the applicant, and that the applicant will comply with the attached assurances if assistance is approved.

Print Name  H.T. Hurd  Title  Director, Sponsored Programs  Phone  540-231-5283
Signature  Date 5/19/2000
2. Abstract

While our nation invests billions of dollars to support graduate research, our graduate students are woefully ill-prepared for the Knowledge Age. Each year, 50,000 US students produce doctoral dissertations, even more produce Master’s theses, and 1.7 million students engage in graduate-level work, yet little of their research is published or read; few works circulate past local libraries; much research is poorly written; and few studies benefit from the effective use of multimedia tools. Most university campuses have no digital library of works produced by their own scholars nor do they know how to develop one. For some students, the dissertation is a meaningless hurdle.

By launching a Graduate Student Development Initiative (GSDI), we will create the tools and processes needed to better prepare students for scholarship in the Knowledge Age. GSDI is a dissemination project involving five leading universities that will develop an integrated approach to facilitate e-scholarship. Our training and reference materials will address the value system that underlies intellectual property issues, will enhance students’ writing and communication skills, will transform mentoring, and will reveal the best ways to identify self-archived documents so that they can be more easily found by others. We will help students contribute to, and make use of, electronic resources – especially those made freely available through the Open Archives initiative (OAi), a movement that is working to solve the problems that keep scholarly documents from being easily accessible. Our emphasis will be on electronic theses and dissertations, extending the work that began with FIPSE funding (1996-1999) of the Networked Digital Library of Theses and Dissertations (NDLTD), resulting in an increase of U.S. member universities from 43 to 100, including at least 20 minority institutions and 20 Research I universities. Potentially over 100,000 students yearly will gain knowledge and skills through this program. GSDI has the potential to transform graduate education. By the end of the project, the NDLTD will be a self-sustaining federation and the GSDI will be an ongoing educational program, enhancing the research productivity of the USA.
3. Proposal Narrative

3.1. Problem Statement

We focus on two major problems relating to graduate students and scholarly communication: 1) preparing students to be effective communicators, and 2) increasing access to student research results.

1. Most graduates from US universities are not adequately prepared for the Knowledge Age. From our work with 2500 Virginia Tech students who prepared electronic theses or dissertations (ETDs) and from the experiences of other universities who are members of the NDLTD [1-9] (see Table D.1 in Appendix D), including USF, UK, Iowa, and Caltech, we have found that most graduate students have little knowledge of electronic publishing or digital libraries [10-19], which are becoming important resources in the Knowledge Society [20-23]. Information technology is continuously evolving [24] and being integrated into all aspects of academic life. However, many students are not prepared to communicate effectively through electronic documents. They don’t know how to make their research easy to find or to navigate through, they have minimal knowledge about copyright or publishing policies, they lack skills to submit proposals and papers electronically, and they have minimal ability to create multimedia works that can be easily preserved for access by future generations.

2. About 50,000 U.S. students produce doctoral dissertations [25] each year; even more write master’s theses. Only a very small percentage of their research is published, in highly condensed form, in journals or monographs. Few theses circulate past their local libraries. UMI very rarely sells more than 7 copies per year of a typical dissertation, though their product Dissertation Abstracts is useful to identify completed dissertations. Interlibrary loan (ILL) services are the primary means of access to theses and dissertations and while this service is usually not for a fee, the time delay discourages its use. To acquire theses from ILL, one must first be able to identify what is useful or relevant; in most disciplines, finding such student works is nearly impossible.

These problems are serious, and while billions of dollars are spent to support student research, dissemination of findings is usually weak, “locking up” important knowledge and depriving students of the visibility they might warrant. This limited communication and access leads to many graduate
research projects proceeding without knowledge of similar completed student investigations. In spite of millions of dollars invested in technology, most campuses have no digital library of works produced by their own scholars, and do not know how to develop one. Without outside guidance/assistance (e.g., from this project), many libraries will not have the expertise required to put a digital library in place nor the resources to support it simultaneously with traditional resources. Additionally, although a growing number of free scholarly archives and electronic journals are available, few students are aware of the many ways that they can support learning and research – in school, in their jobs, and for life-long learning. This project will provide the processes and tools to help university libraries to develop the expertise to oversee a digital collection, as well as to help students learn to create and use electronic resources like those available through the Open Archives initiative.

3.2. Goals, Objectives, Improvements (see Table 1)

Theses and dissertations prepared by post-secondary students should be created and archived, by them, in suitable electronic formats; this activity adds value by educating the student about the process and by making the student’s research available to others. Whenever possible, students also should do this for other published works (e.g., preprints and reprints of journal or conference papers). We refer to these electronically accessible works of students as “e-works”.

Other important goals of this project include improving the quality of e-works, making them more widely accessible (including through effective resource description and indexing), and integrating them more thoroughly into higher education. Students should learn to understand electronic publishing and digital libraries so they can prepare and upload their own works into open archives such as the Networked Digital Library of Theses and Dissertations (NDLTD), and to make use of these resources themselves for research. Universities should establish digital libraries that will dramatically increase access to higher-education research results and expand cooperation. Preparing e-works should become common practice at research universities, leveraging ongoing advances in information technology and also enabling greater use of the features of software that universities already license.
Table 1. Summary of Project Goals, Areas of Emphasis, Activities, Deliverables, and Outcomes

<table>
<thead>
<tr>
<th>University</th>
<th>Areas of Emphasis</th>
<th>Activities</th>
<th>Deliverables and Outcomes</th>
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<tbody>
<tr>
<td>Virginia Tech</td>
<td>1. Coordination and support</td>
<td>1. Oversee partner activities, meetings, outreach efforts. Provide staff, facilities, and technical support. Package resources. Assist with log analysis. 2. Liaise with Steering Committee. Maintain Web sites including: training resources, union collection of ETDs, and NDLTD member information. 3. Assist with OAi workshops, meetings, and training resources as well as outreach work.</td>
<td>1. Established national GSDI initiative, led by project partners and widely adopted across the nation 2. Expanded NDLTD to include at least 100 US universities, with at least 20,000 ETDs submitted 3. Expanded Open Archives initiative, with at least 50 US university based archives involved, and widespread usage by graduate students</td>
</tr>
<tr>
<td>U. Iowa</td>
<td>Professional development of graduate students</td>
<td>Liaise with CGS, respond to recommendations in national reports recommending changes in graduate education, prepare training resources</td>
<td>1. Plan for partners and CGS to implement and extend GSDI 2. Resources to aid professional development of graduate students</td>
</tr>
<tr>
<td>Caltech</td>
<td>Student understanding of scholars’ responsibilities</td>
<td>1. Identify, interview, and collect information from faculty about sharing scholarly results; produce video and Web resources to explain 2. Assist with outreach to expand OAi</td>
<td>1. Web-based interactive site about sharing research results, intellectual property management, etc. 2. Thirty minute documentary video extract from site for widespread use on campuses nationwide</td>
</tr>
<tr>
<td>U. Kentucky</td>
<td>1. Student understanding of concepts of library and information science (LIS) 2. Evaluation</td>
<td>1. Design and prepare content for Web-based interactive site about LIS, focused on how to assign metadata to a self-archived work 2. Further develop the Metamorphosis project so it can be used by project partners and new members of NDLTD</td>
<td>1. Resources to aid learning about LIS; students understanding key concepts (creation and use of metadata and indexing; discovering and harvesting useful resources efficiently/effectively) 2. Metamorphosis; GSDI Project refined based on formative evaluation; Evaluation reports</td>
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</table>

Overall Goals:
1) to launch a nationwide initiative to enhance graduate education, building upon prior work with the Networked Digital Library of Theses and Dissertations;
2) to prepare graduate students to be effective communicators in the Knowledge Age, skilled with electronic publishing and digital library technologies;
3) to increase access to graduate student research results, especially ETDs, as well as high quality e-prints through the Open Archives initiative.
We plan to involve 100 U.S. universities, including at least 20 minority institutions and 20 Research I universities. Potentially over 100,000 students yearly will gain knowledge and skills through this program, with at least 20,000 submitting e-works, and many more using them.

Today’s electronic authoring tools, if properly used, can help students improve the quality of e-works and enhance mentoring. For example, by using the “comments” or “tracking features” in Word, “Notes Tool” in Acrobat, “routing features” in Outlook, or the “discuss features” in Internet Explorer, students and mentors can interact, and members of students’ committees can share suggestions and criticisms. Instructors will use e-works in courses, as will students engaged in general browsing or research. In addition, students can enrich their e-works with hypermedia content and navigational devices/links (such as thumbnails and bookmarks) to assist readers using their e-works. Once created, these works must be organized and effectively represented for easy access and retrieval in digital libraries and open archives.

Led by Virginia Tech, the GSDI will address the primary issues related to e-scholarship. Each of 4 partner universities will play a lead role in addressing a key obstacle related to e-works. Each will disseminate project results to nearby and peer universities, ensuring a stable base of growth nationwide.

The University of Iowa will develop ways in which students can make effective use of new and emerging information technologies that not only support their graduate academic work but also their professional development and their understanding of technology transfer.

USF will play a lead role in dealing with barriers to effective writing and communication faced by students. It will work closely with institutions throughout Florida, which has a state center for library automation. USF has an active writing center, and has obtained support from Microsoft to help develop and apply new tools to support student authors so the quality of the language in e-works will improve.

The California Institute of Technology (Caltech) will take the lead role in teaching both the next generation of scholars and current faculty about their rights and responsibilities regarding scholarly communication. Students will develop a clear understanding of the importance of ensuring researchers, teachers, and students ready, long-term access to electronic research materials. Key topics will include
scholars and the OAI, impact of access restrictions on the scholarly record, and legal issues surrounding copyright. Caltech will develop a package of educational materials, in 3 formats (print, video, and Web).

The University of Kentucky will ensure that key concepts of library and information science (creation and use of metadata and indexing to facilitate the organization and management of electronic data and to enable users to discover, identify, and harvest relevant and useful resources efficiently) inform the overall effort. Kentucky also will play the lead role in evaluation.

The four project partners are scattered around the USA to ensure outreach across the nation. Having partners in Iowa and California enables us to better reach states in the Central and Western regions. This is particularly important given the GSDI’s relationship to the Networked Digital Library of Theses and Dissertations, which has not yet spread widely in those two regions (see Table D.2 in Appendix D).

3.3. Background Information about the NDLTD

The GSDI is unique in that it breaks new ground while also extending the 1996-1999 FIPSE project that provided support to the Networked Digital Library of Theses and Dissertations. NDLTD has had great impact on graduate education with more than 80 universities joining worldwide (see Table D.1). The value of NDLTD is reflected by the fact that each university has committed graduate school staff, library personnel, and other stakeholders to contribute their time to implement programs for ETD [26] creation and sharing. Almost half of these institutions are outside the USA, giving U.S. students exposure to languages and research results from other cultures. Initiatives at foreign universities will benefit all NDLTD members. Joint funding from DFG in Germany [27]) and the NSF is supporting collaborative research on multilingual federated digital libraries. Universities send teams to visit Virginia Tech to learn how to initiate ETD and digital library activities. However, NDLTD is at a critical juncture and without further FIPSE support, we will lose the tremendous momentum we have worked to generate (see Figure D.1 in Appendix D). Many more universities want to join the NDLTD but require assistance to participate. Based on what we’ve learned developing the NDLTD, the GSDI is designed to provide the assistance American universities need to foster graduate research in the Knowledge Age.
The NDLTD universities form a collaborative federation. A Steering Committee, with many representatives, including those from Adobe, CGS (Council of Graduate Schools), CIC (for the Big Ten), CNI (Coalition for Networked Information), ISTEC (Ibero-American Science & Technology Education Consortium), National Library of Canada, OCLC, SOLINET, and UNESCO [28] – see their support letters in Appendix C – directs overall strategy. The University of South Florida (USF) hosted 225 people attending the March 2000 annual conference on ETDs, and Caltech will host the next conference, in 2001.

Since 1997, all Virginia Tech master’s and doctoral theses (over 2500) have been submitted electronically. Most works use color figures, diagrams, or images; some 600 multimedia files are included as well. The average size of an ETD has grown from 1 to 3 megabytes. This collection is accessed over a million times per year. More than 80% of the ETDs have been accessed at least 100 times. 86% of Virginia Tech students responding to a survey found the ETD Web site useful. The level of success achieved with the ETD workshops and educational resources developed at Virginia Tech presage great success for the GSDI program.

Virginia Tech supports GSDI, OAi, and NDLTD through its Digital Library Research Laboratory, University Libraries, and Graduate School. FIPSE’s support of NDLTD was pivotal in its success, and that funding has been a good investment in promoting higher education as evidenced by the fact that NDLTD later attracted corporate participation. IBM, Microsoft, Adobe and OCLC all saw the value of helping students enter the digital age and so have donated more than $1M in hardware and software. The Virginia Tech team that managed the NDLTD project also will be heading up GSDI and has extensive digital library experience [29-31]. The GSDI partner universities are well situated to interface with NDLTD members. Table D.2 shows the location of NDLTD members throughout the USA.

As is shown in Table D.1, the 43 current members of NDLTD represent a broad and diverse sample of the set of U.S. universities. The firm foundation of participation in the Southeast, that began with funding by the Southeastern Universities Research Association in 1996, and expanded through FIPSE support 1996-1999, will be extended by efforts of project partners in Florida and Kentucky. In particular, USF will work with the Florida Center for Library Automation to support statewide ETD efforts.
Similarly, Virginia Tech will continue to work with OhioLink, which has agreed to support institutions in Ohio. Virginia Tech also will focus on institutions in the Mid-Atlantic and Northeast, including Brown, Columbia, Cornell, U. Delaware, U. Maryland, Princeton, Rutgers, SUNY, Yale, and others.

Figure D.1 indicates that membership in NDLTD has grown steadily since that federation was launched early in 1997. Without further support, neither Virginia Tech nor its partners will be able to ensure that the momentum gained over the last three years can be sustained; however, the NDLTD is nearing the number of members needed for it to become self-sustaining by charging dues. The GSDI would provide the educational support needed to bring the NDLTD to a critical mass of universities.

Shown in italics in Table D.1 are those NDLTD members that require submission of ETDs. At present there are only four in the USA, though MIT also has a large number of ETDs since it scans in works that are submitted on paper. For the NDLTD to have really broad impact, many more members must move beyond the pilot stage, to allowing ETDs to be submitted by interested authors, and finally to requiring submission (which with proper support is straightforward and rapid). Thus we will progress from the situation shown in Table 2, with only a moderate number of ETDs available, to the ultimate goal when all graduate students prepare ETDs, producing over 100,000 per year worldwide.

It should be noted that a 1-2 year period is often required from the time that an institution becomes seriously interested in NDLTD to the time that full participation occurs. We hope to speed up this process by providing better support and training materials. We also plan to extend our dissemination efforts to include steps listed in Table 3.

3.4. Enhancing E-Scholarship (University of Iowa)

The University of Iowa will develop ways in which students can make effective use of new and emerging information technologies that not only support their graduate academic work but also their professional

<table>
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<th>Table 2. Some ETD Collections</th>
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<tr>
<td><strong>Site</strong></td>
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<tr>
<td>MIT</td>
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<tr>
<td>Encyclopedia Diplomica</td>
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<td>Virginia Tech</td>
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<td>HU Berlin</td>
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<td>TU Graz</td>
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<td>W. VA</td>
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<td>Dissertation.com</td>
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<td>U. Konstanz</td>
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development and understanding of technology transfer. The basis for Iowa’s participation in this project is detailed in its white paper, “Impact of ETDs upon Graduate Education.” Iowa will further develop modes of group and one-to-one instruction for students on how to submit ETDs using XML (eXtensible Markup Language). It will survey both students and their mentors about what they were able to accomplish by developing scholarly work in an electronic environment. Iowa will conduct formative and summative evaluation of this component of the project by surveying students and mentors concerning:

- the effectiveness of group and one-to-one instruction
- accomplishments resulting from participation in an ETD program
- post-graduate experiences relating to careers and, more specifically, the benefits of exposure to new technologies in the job market

<table>
<thead>
<tr>
<th>Table 3. Steps in Dissemination Effort</th>
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<tbody>
<tr>
<td>1. Nurturing NDLTD members, by providing them with useful training resources, encouraging them at meetings, visiting them when requested, and facilitating access to their collections;</td>
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<tr>
<td>2. having project partners reach out to nearby and peer institutions;</td>
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<tr>
<td>3. working with supporting institutions (e.g., see letter from CIC regarding the Big Ten, and letters from CGS and CNI regarding sessions at their conferences);</td>
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<td>4. enticing new members with the donated software from such supporters as Adobe (see letter in Appendix C);</td>
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<tr>
<td>5. continuing the practice of annual meetings, which greatly aids members and interested parties, especially with such strong interest (225 attending the March 2000 meeting hosted by USF, and a goal of 400 for the next meeting that Caltech will host);</td>
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<tr>
<td>6. extending the scope and hence the size and value of digital libraries built at universities, through the Open Archives initiative, so there is greater motivation to participate;</td>
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<tr>
<td>7. visiting sites interested in NDLTD when invited, and offering to visit sites that the Steering Committee advises should be approached;</td>
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<tr>
<td>8. solving key problems and removing obstacles to project goals, by carrying out the work identified in the remaining sections of this proposal.</td>
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**Timeline: Year One:** Planning and designing approaches to group and one-to-one instruction. In Year 1, the College’s Implementation Team and Technical Committee will work with the support of staff trained in instructional design to develop effective group and individual instruction. Modes of instruction will be designed to enhance students’ skills needed to prepare an XML-based ETD for submission to the Graduate College and subsequent archiving by the University Libraries. The team also will develop a Web-based tutorial for faculty mentors and/or thesis and dissertation committee members on ETDs.
**Year Two:** Full implementation of modes of instruction to University of Iowa graduate students. Under the direction of the Implementation Team with the support of a graduate assistant, Iowa will further refine instructional modules, based in part on evaluative feedback from students and mentors.

**Year Three:** Continue implementation and assess impact on student learning, student-mentor experience, and on post-graduate experience. Iowa will continue to gather information from students and faculty about their experiences with the project and, more specifically, gather information about post-graduate experiences through follow-up surveys.

**University of Iowa Team:** The Graduate College has assembled both an Implementation Team and Technical Committee to serve as a steering committee to plan and execute an ETD initiative for graduate students at the University of Iowa. The Team, consisting of staff and faculty from the College, University Libraries, Information Technology Services (University computing), and the Office of the Vice-President for Research/ University General Counsel, will work with William Welburn, to direct the project.

**3.5. Open Archives Initiative (Virginia Tech)**

The University of Iowa’s work demonstrates that scholarly communication is changing in the electronic age and graduate students need to be prepared for the change. Among the changes is a movement toward much greater usage of digital resources, and a shift toward scholars authoring and archiving their own scholarly works. Several disciplines have refereed journals that are totally on-line and many journals and conferences require electronic submissions. Additionally, researchers have found that by posting their results to digital archives as pre-prints that they can share ideas on a more timely and cost-effective basis.

Scholars realized that the changes in scholarly communication need to be coordinated. Therefore, in October 21-22, 1999, a group of over 20 involved in open archives or related activities or supporting institutions (see www.openarchives.org/partcipants) met in Santa Fe, New Mexico, to discuss the Universal Preprint Service. Later renamed the Open Archives initiative [32], their aim was to promote the establishment and interoperability of archives of scholarly content. The Santa Fe invitational meeting was hosted by LANL and led by D. Waters, C. Lynch, P. Ginsparg, R. Luce, and H. Van de Sompel.
Preparatory work demonstrated harvesting and integrated access to some 200,000 metadata records from 6 archives (including NDLTD) in a “protoproto” service [33]. PI Fox attended the Santa Fe meeting and is coordinating the next 2 follow-on OAI workshops.

OAI is transforming the face of scholarly communication. The “Santa Fe Convention” [34] aims to promote the establishment of archives, that would provide long-term storage, and would host a self-archiving or submission interface. Initially, data providers would start with the “gray literature” of reports, dissertations, and preprints. However, according to a variety of endorsements, the Open Archives initiative will be widely supported, including with online journals from HighWire Press, all public e-prints from MIT, Caltech’s Scholar’s Forum, U. Washington’s EconWPA, California Digital Library content such as University ePUB, and other sources. Virginia Tech will have a number of archives, including roughly 20 electronic journals supported by co-PI McMillan, most resources of the CDDC (see www.cddc.vt.edu), publications and data related to characterization of WWW usage (see www.cs.vt.edu/repository), and educational resources from the Computer Science Teaching Center (www.cstc.org). The ultimate goal is to include many thousands of archives, with millions of books/articles/reports each year. For an archive to become part of OAI, it must:

- Support unique archive identifiers,
- Implement the Open Archives Metadata Set (OAMS: Dublin Core [35, 36] based, using XML),
- Implement the OAI harvesting interface (based on the Dienst protocol [37]), and
- Register the archive with the OAI.

Graduate students headed into academe must have the technical foundation to feel comfortable with the OAI concept and its accompanying aspects. GSDI involves educational and dissemination efforts that will provide this education and support the aims of OAI, focusing on open archives in institutions across the USA that support graduate education and research. We expect that GSDI efforts also will benefit others working on OAI, as well as many involved in digital library projects [17].

Underlying this work are the principles articulated in Table 4.
Table 4. Key Practices Underlying NDLTD and Future Open Archives

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| 1. | Service-minded scholars and/or librarians interested in the research results of their discipline or institution build/establish digital libraries (hereafter referred to as “archives,” when used in this special sense).
| 2. | Individual scholars learn key concepts of library and information science that will help them discover useful related works, including from electronic archives.
| 3. | Authors learn how to create their own documents through which they contribute to scholarly communication in a manner that ensures continued open access to their work.
| 4. | Authors learn key concepts of (digital) library and information science that will help them submit their works directly into archives, preferably also reducing downstream costs of finding and preserving those works (e.g., by selecting appropriate descriptors from an online classification, and by preparing their works in accordance with standards chosen to streamline the process of preservation).

3.6 Metadata Education (University of Kentucky)

The Problem: As evidenced by OAI, the advent of digital libraries and archives is changing the face of scholarly communication and creating new avenues of knowledge dissemination. Traditionally scholars have used journals, books and other information sources in ways that made them document consumers. In today’s electronic environment, scholars can still be document consumers, who access a wide array of electronic information resources. However, digital libraries add a new dimension to scholarly communication. Scholars can become document creators who author information included in digital libraries and archives [38, 39].

This new aspect of scholarship requires document creators to self-archive/post their works to digital libraries and archives. However, a work will not be valuable to others unless discovered and retrieved. Therefore, the document creator needs special training to properly self-archive the work and assure that it can be discovered by others. Most graduate students are not familiar with the conceptual foundations of information storage and retrieval and would have difficulty accurately self-archiving their works.

Teaching students about the fundamentals of information storage and retrieval has dual benefits:
1. It enhances the research skill of students since their increased understanding of how information is stored and organized allows them to create more effective search strategies.
2. It helps students understand what they need to do to effectively self-archive their ETDs.
Every information transaction requires that an information seeker can find the information that is available to answer his or her question. Whether information is arranged as full-text or surrogate records, the ability to easily discover and recover the information is a primary concern. To do this, the
information system must be able to identify the existence of pertinent documents, provide access points to the documents, produce a list of relevant documents, and provide means of locating chosen documents.

Access points can be machine or intellectually generated. Machine generated indexes generally rely on keywords extracted from the document by computer programs. While they can be very useful in tightly defined technical fields they are less constructive as the database grows and the scope of topics increases. Machine generated indexes are also less effective in dealing with multidisciplinary and interdisciplinary subjects, and require the searcher to be very skilled in defining the terms of the search.

Intellectually assigned subject terms are carefully chosen to reflect the content of the document. Working with intellectually generated indexes requires a person to use disciplined judgment in applying pre-existing terms from controlled vocabularies. Whether an index is based on a subject heading, descriptor, or index string, it provides a variety of access points for the searcher to recover information.

Metadata recorded in surrogates such as catalog records or Dublin Core allow for very effective searches. Metadata, which can be thought of as structured data about data, enable useful searching capabilities including fielded searches (i.e., searching by specifying specific fields such as author, title, language, etc.). It also provides a fundamental mechanism that increases the possibilities of interoperability between databases, and facilitates the use of powerful tools such as federated searches.

**Project Activities:** Kentucky proposes designing a 2-part self-administered online tutorial that acquaints students with the fundamentals of information storage and retrieval, introduces the concept of metadata and guides the graduate student to create a metadata record for the thesis or dissertation that is being self-archived. Each tutorial module would be designed to take approximately 20 minutes to complete.

<table>
<thead>
<tr>
<th>Part 1: Finding Knowledge</th>
<th>Part 2: Storing Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is information storage and retrieval?</td>
<td>Intro. to metadata schemes such as DC, EAD, GILS, GIS</td>
</tr>
<tr>
<td>How do we find what we are looking for?</td>
<td>How does the document creator determine what metadata scheme to use</td>
</tr>
<tr>
<td>Metadata: an introduction</td>
<td>Semantic tagging: How to choose appropriate metadata for your document</td>
</tr>
<tr>
<td>What is metadata?</td>
<td>NDLTD metadata guidelines</td>
</tr>
<tr>
<td>The purpose of using metadata</td>
<td>Creating an NDLTD metadata record</td>
</tr>
<tr>
<td>Overview of how document encoding schemes affect storage and retrieval</td>
<td></td>
</tr>
</tbody>
</table>

12
Schedule: Year One: Material Gathering, Instructional Design

The content and other aspects of instructional design for the tutorial modules will be created under the direction of Dr. Lois Mai Chan.

Year Two: Module production, Pre-testing on-site

The modules will be produced to Dr. Chan's instructional design specifications. Prototypes of the modules will be pre-tested with graduate and undergraduate students at the University of Kentucky to determine the effectiveness of the design by measuring comprehension and ease-of-use. Modifications will be made as needed to create a better product. UK team members will disseminate preliminary results at appropriate academic conferences.

Year Three: Module dissemination, Evaluative testing

The modules will be disseminated to partner institutions for use with their students. Evaluation will continue to determine how modules may be improved. By the end of this year, the modules will be available to other institutions. UK team members will disseminate final results at appropriate conferences.

Qualifications: Professor Lois Mai Chan, School of Library and Information Science, is an expert in subject access to information and machine-readable cataloguing records – cataloguing, controlled vocabulary, and knowledge organization. Dr. Chan serves as project consultant for OCLC’s Cooperative Online Resources Catalog (CORC) Project and has served as consultant to the Library of Congress Cataloging Policy and Support Office. She has served on the Subcommittee on Metadata and Subject Analysis for the Association of Library Collections and Technical Services and on the International Federation of Library Associations and Institutions’ Standing Committee on Classification and Indexing.

3.7 Education on Responsibilities for Scholarly Communication (Caltech)

The changes occurring in scholarly communication also raise other important issues. For example, a significant issue in ETD submission is whether to allow the electronic document to be viewed worldwide, by campus only, mixed (some parts freely available and some parts – e.g., a chapter related to a journal submission – restricted), or not at all (e.g., when patent application is pending). The majority of students
from Virginia Tech, after meeting with their faculty committees, chose their document to be viewed by at least the campus (see Figure D.2). Ongoing discussions with publishers, so that they understand the goals and benefits of NDLTD, should help in this regard (see http://www.ndltd.org/publshrs/). We are pleased to see a change in attitude by some publishers over the course of the project; the American Chemical Society developed a policy more favorable to NDLTD as a result of lengthy discussions. However, it is clear that very few students or faculty understand clearly this matter, suggesting education is in order. This could be of great benefit since now many restrict access, while a recent survey indicates that 100% of publishers contacted by students for permission to open access had no objection.

**Problem:** Thus, digital innovations in scholarly publishing are currently hampered by risk-aversive behavior on the part of the authors. Unclear about the social and legal implications of intellectual-property management, new scholars adhere to traditional models out of fear of the unknown rather than through an understanding of the historic principles under which scholarly research has been shared.

**Project Activities:** Caltech will take the lead role in preparing materials that express the value system that underlies intellectual property issues for the scholar. Through network technology, students will be exposed to relevant analyses and opinions covering research communication practices and behaviors that lead to progress in scientific discovery. This information will articulate the core value of common property ownership of research results in the interests of scientific enquiry. Students and faculty will be encouraged to embrace their role and responsibility as scholars by ensuring open access to their work.

Specifically, Caltech will prepare a web-based, interactive self-edification site of compelling materials that alert and educate the new scholar to the historical base of sharing research results and informs the student of possible actions regarding intellectual-property management that consciously comply with the community property concept. Key topics will include responsibility of scholars to each other and to society; impact of access restrictions on the scholarly record, legal issues surrounding current copyright practices, and the alternatives that the Open Archives initiative and the NDLTD provide.

The web-site design will follow a narrative structure built around filmed interviews of Caltech professors. They will describe their experiences conducting research; will highlight the evolution of their
successful careers as it relates to unhindered access to the earlier research record. They will explain how they discovered the unexpected limitations on access to the scholarly record that the current legal environment has created despite the possibilities of the digital network and what they have done about it. The Caltech faculty is among the most successful and productive group of researchers in the world. Their own behaviors and stories, captured through filmed interviews, will serve as concrete manifestations of the core value system. This content will be used to illustrate, document and personalize the story of open access in scholarly enquiry. Caltech librarians will enrich the site by selecting and using research materials, policy reports, and documented effects of the current copyright law to augment the real-life stories of active researchers. Alternative publishing mechanisms of the Open Archives initiative and the NDLTD will be included to illustrate constructive options.

Creating the web site involved planning content, presentation, and accessibility. Appropriate media types will be selected and the technical deployment schema laid out. Production templates for various levels of format compression will be generated to support a variety of browsers and platforms. Documents, reports, papers will be gathered and permissions gained for adding to the web site as desired. Finally, a threaded model prototype of the website will be mocked-up and used for initial testing.

In addition to the website, deliverables will include a short, 30min. documentary style stimulation or trigger piece, extracted from the website and packaged in an easily portable format (VHS, DVD) for the participating schools. Each school will duplicate and distribute the piece to relevant units on campus for use in instructional or guidance sessions. This synopsis vehicle will guide students to the richer website.

Caltech will be the initial test site for usability, continued interest, and satisfaction among graduate students. Data will be collected as a result of voluntary responses via a web form. Caltech will participate in the formal evaluation, managed by the Kentucky team. Caltech will provide usage statistics of the web site, to track use and impact of presentation and educational efforts at the target campuses.

Qualifications: The Caltech Administration, Faculty and Library System have demonstrated a committed interest to alternatives in scholarly communication. The Provost hosted one of the ground-breaking conferences on the topic in March 1997. The Library Administrative team, Anne Buck, the University
Librarian, Kimberly Douglas, Director of the Sherman Fairchild Library, and Eric Van de Velde, Director of Library Information Technology were instrumental in providing the back-bone of a campus-wide interactive web-based discourse on the issue of copyright of scholarly articles and continue to work actively with Caltech faculty on intellectual property issues as they relate to the development of digital archives. Caltech is a participant in the Open Archives initiative. Anne Buck and Professor Rick Flagan’s proposal entitled the Scholars’ Forum (http://library.caltech.edu/publications/scholarsforum/) provides continued stimulation on new forms of scholarly communication. Professor Rick Flagan recently presented a paper on alternatives to current publishing patterns to the Council of Scientific Society Presidents in May 2000. Wayne Waller, manager of Caltech’s Digital Media Center, is a recognized expert in preparing media for deployment over the network and in visualization techniques for research purposes. The DMC prepares multi-media presentations for faculty and actively partners with the faculty to bring graphics into the research process.

3.8 Education for Effective Communication (USF)

GSDI will build educational materials on electronic publishing and digital libraries that complement and extend those developed for NDLTD (see http://etd.vt.edu). Additionally NDLTD materials must be updated to be more useful in workshops and for self-study. At many universities, including those who are not members of NDLTD, there is a strong demand to produce a variety of videos and other materials, including technology based tools. Extensive usability testing of all materials is needed. New tools must be developed to help with the application of emerging standards like XML and the Dublin Core. To serve the needs of graduate students, GSDI will leverage over 7 years of experience with the Virginia Tech Faculty Development Institute (http://www.fdi.vt.edu/), and will adapt many of the resources produced to help faculty. Through GSDI, Virginia Tech and its four partners will create, refine, and disseminate materials developed at each institution to members of the NDLTD and other universities interested in preparing their graduate students for full participation in the Information Age.
At the heart of this project is preparing students so that they can effectively communicate. To support this ongoing demand, the USF project team will focus on “Tools and Training Materials for Academic Authors and Mentors.” The USF Project Goals are as follows: Help faculty and students find their voices as researchers and scholars, improve their writing and the likelihood that they complete their research and writing in a timely fashion, effectively use the advanced features of available software to create effective theses and dissertations, and employ multimedia in their scholarship.

The Problem

1. Poor student writing. Faculty and administrators who resist electronic scholarship often point to poor document quality as yet another reason to limit access. The editors of *Nature* have called for more readable scientific writing, in response to a study by Donald Hayes that found that articles in *Nature* had become progressively more difficult to read since 1947 [40]. Glanz, writing in *Science*, warns “the flood of unexplained acronyms, cryptic symbols, endless sentences, and nightmarish graphs” prevents scientists from communicating with one another, not to mention the rest of the world [41]. While strong in math and science, graduate students and faculty in science and engineering lack training in writing [42-44]. Many hold misconceptions about writing, believing, for example, that one needs large chunks of time to write, that thinking and research should be separated from the writing process, that one should edit preliminary drafts [44]. Students with ESL backgrounds, who constitute an increasingly large percentage of our graduate students, especially need additional assistance with advanced academic writing [45]. This is particularly an issue in science and engineering disciplines, which have a concentration of non-U.S. citizens seeking graduate degrees. In 1995 these disciplines had the highest percentages of non-U.S. citizen graduate enrollment: engineering at 36%, physical sciences at 32%, and biological sciences at 24% [46]. With increasing numbers of ESL (English as a Second Language) students and basic writing problems among traditional students (and some faculty), research universities must stop overlooking students’ needs as writers [40, 47-50]. Kluever found that ABD doctoral students as well as graduates identified instruction on dissertation writing as critical to success [51]. Subsequently, in a survey of aerospace
engineering students, Pinelli et al. concluded “the successful transition of the student from the academic environment to the professional community is based on language and written communication” [52]. Furthermore, when they’ve been exposed to science communication workshops or materials they “often express amazement that there is so much to learn about communication and that appropriate ‘packaging’ of information can mean so much to the impact of the message” [42]. This is a key skill required for research. In this era where there is rapid evolution of tools and methods to support writing and presentation, word processing and electronic publishing, production of multimedia and hypermedia documents (with digital drawings, images, videos, music, and sound), and collaboration around “e-works,” students can best learn relevant skills in-context. As shown in Figures D.3 and D.4 of Appendix D, which document the accesses to relevant NDLTD training materials logged during the early part of our prior FIPSE-supported project, users are particularly interested in using “how to” information.

2. Students working on theses or dissertations, often the leaders in research and scholarship, face problems in completing those documents in a way that prepares them for the demands of their future careers [53]. Lacking writing skills and social supports for writing, nearly half never finish and end up ABD. Nearly half of our nation’s 90,000 doctoral students complete their coursework but fail to complete their dissertations (Ogden). In the 1997 Kluever study of ABD doctoral students, good communication with the committee was identified as critical to completion of dissertations. Graduate students often find writing theses and dissertations an isolating experience, lacking in peer support [54]. Boice found that social support for writing helped reduce writing blocks for academicians [55]. Cuetara found in his study of doctoral students that the quality and quantity of advisor-advisee contacts were significantly related to dysphoria during the dissertation [56]. Similarly, Dillon et al. found that weekly feedback from faculty was critical to successful completion of master theses [57]. At present, graduate students tend to meet with one committee member at a time, sometimes hearing diverse ideas about how to conduct and report research.
3. Much of the functionality needed to support graduate education is already available in the commercial software market, but these computer tools are current underutilized. Many commercial software applications developed for business and commercial use have capabilities that could be directly applicable to problems faced by students during their graduate careers. However, the complexity of these packages is often daunting; indeed many of their most valuable features are buried beneath others that are largely irrelevant to research and writing processes. Surprisingly, even at major technical universities, such as MIT, faculty and graduate resistance to electronic scholarship has been a stumbling block. The biggest obstacle to implementing ETDs tend to be “human engineering factors” including students’, staffs’, and faculty members’ computer illiteracy. The need for such training at the faculty level and graduate student level is well documented. After completing his most recent annual survey of computer use on university campuses, Kenneth Green, Director, Campus Computing Project, recently concluded “I think it's fair to say that many faculty members have ceded to their students the whole issue of technology skills” [58].

4. The standards of scholarship are evolving, creating new challenges for graduate faculty and graduate students [59]. Graduate students and graduate faculty have many cutting edge tools to choose from; however, the burden falls to users to find, access, integrate, and learn from these tools. Today’s students and faculty are unsure about which multimedia tools will be archivable and accessible to future generations. Without a coordinated effort on the part of our proposed consortium, disciplines may define disparate and conflicting ideas about authoring platforms and archiving standards. Senior faculty, who often serve as M.A. and Ph.D. Chairs, often have a “typewriter” mentality when it comes to graduate education. These faculty need to be introduced to new tools and innovative ETDs before they are prepared, for example, to encourage defenses in MOOs, hypertextual dissertations written for diverse audiences, or streaming audio and visuals.

**Project Activities:** Based on our analysis of the milestones students and faculty face as writers, we will develop just-in-time educational resources to support students’ needs as writers and faculty members’ needs as mentors. We will develop a writing environment, training materials, templates, wizards, and
macros — tools to facilitate e-writing — both technology to support specific activities such as data analysis and software that manages the processes of graduate education. Throughout our work, we will ensure that our materials reveal their benefits to users. We will account for different learning styles and time commitments by developing a continuum of training options, including a Web site; a distance learning version; and a CD-ROM version of the training. See Appendix A for an outline.

**Expected Outcomes:** Students will appreciate our training materials and toolset because the environment will show them how to accomplish their writing, research, and publishing goals. Our materials will encourage students and faculty to write regularly, understand rhetorical principles and readability guidelines, and think beyond the straight jacket of the traditional print thesis. The communications capabilities of the tools will facilitate the development of multiple levels of support groups: fellow students, the student's committee and major professor, students from elsewhere in the university or from other locations, and faculty from outside of the student's home institution. Past research has demonstrated that support for research and regular writing helps graduate students complete their work in a timely and professional manner.

Faculty will support and appreciate the training materials and toolset because less time would be spent in individually tutoring students. Each student would develop a bibliography reflecting his work, and a collective bibliography would emerge encompassing all of a faculty member's advisees. A student's acquired expertise will not completely leave with that student but will remain to help bootstrap new students (and new interests of the faculty member). Finally, because these tools emphasize interactions and networking, the efforts of students working with a faculty member will be known to a wider audience. Similarly, their final electronic theses would also be much more accessible. This would provide publicity and enhanced visibility for the student and that student's lab and major professor.

**Evaluation:** USF will conduct initial and continuous evaluation of the suitability and effectiveness of the writing environment and training materials. Our evaluation will identify deficiencies in the quality of the specific tutorials as well as missing components. We will test these materials with 20 graduate students involved in our NewMediaWriting research project, and with 60 students in our graduate courses
sponsored by the Colleges of Arts and Sciences, Business, Engineering, and Medicine. Participants will be asked to evaluate specific components of the training materials as they use them. They will provide an overall evaluation near the end of this development period. USF will provide continuous monitoring on the use of the website to meet the structure that the instruments of the University of Kentucky evaluation team will specify. The USF team will monitor the evaluative feedback on the usability of the website and make refinements as necessary in order to promote the service to more universities. Content and design will be upgraded as new materials and technologies become available and can be supported. Data will be collected as a result of voluntary responses via a web form. USF will participate in the formal evaluation to be managed by the University of Kentucky team. USF will provide usage statistics of the web site, to track use and impact of presentation and educational efforts at the target campuses.

Qualifications: Passionate about the value of multimedia scholarship, the effective use of existing tools, and digital libraries, the USF team has been working collaboratively for the past two years. We have secured limited support from Microsoft, Dell, and Adobe. As a result, we have ten networked computers that are loaded with the tools graduate students need to create ETDs, including all of Microsoft’s and Adobe’s tools and some of Macromedia’s. Presently, we are working with a team of 20 interdisciplinary faculty and students. With hopes of inspiring graduate students at USF, we are working to develop exemplary ETDs.

In the past, we have held workshops for graduate students and faculty, and sponsored an international symposium on electronic theses and dissertations that was attended by 225 attendees, representing 13 countries and 35 states (http://etd.eng.usf.edu/conference). Team members (see resumes in the Appendix) have presented their work at international conferences, coauthored essays, and met biweekly for one and a half years. Joe Moxley has edited or authored nine books on academic writing. Bruce Cochrane is Professor of Biology and Director of Interdisciplinary Studies. Rosann Collins directs the Business College’s graduate program on mentoring and research methodologies. Anita Callahan, an Associate Professor of Engineering, is a pioneer in distance education, associate chair for industrial engineering, and graduate program director. Terry Beavers leads USF’s instructional assessment initiative. Ilene Frank
and Monica Metz-Wiseman direct the university’s virtual library initiative. Mike Salmond teaches classes in multimedia authoring and Flash for IT.

3.9 GSDI-Wide Evaluation

The GSDI is especially effective because:

- The five participating institutions represent a broad spectrum of academic foci, student populations and institutional styles.
- Unique, self contained project products will be developed independently at each site then combined into an integrated program with extensible capabilities.

These characteristics are very beneficial to the project and offer exciting possibilities for summative evaluation. However the challenges they present for formative evaluation are recognized and addressed by the evaluation plan as well. To answer these dual needs, the evaluation plan is divided into two tiers (see Table 5): the initiative level and the project level. Each tier features an evaluation design that includes formative components to assess how the project is progressing and summative components to assess how the project is impacting students.

TIER ONE EVALUATION – INITIATIVE LEVEL: Brief Narrative

As noted above the formative evaluation activities will provide a means for maintaining effective development of the GSDI. Table 5 represents an overview of how GSDI progress will be tracked. Regularly scheduled (quarterly) reviews conducted electronically will maintain overall management of the project and promote on-going communication between consortium members.

GSDI’s results in terms of outcomes 1 and 2 will be evaluated by studying student attitudes and competencies throughout the duration of the project at both participating and non-participating institutions using a specially adapted version of UK’s Metamorphosis research design.

Metamorphosis is rooted in established technology acceptance research and extends this work to reflect the digital library environment and to provide longitudinal capabilities. The electronic environment is unique from most of the technological contexts that have been studied in the past because it encourages bi-directional information flow (BIF), which Metamorphosis defines as the direct exchange of information documents between two individuals using an electronic intermediary such as a digital library. This creates connectivity for scattered populations and promotes unique behavioral and social phenomena that have not been addressed in commonly used technology-oriented models. BIF also requires participants to have special skills, such as the ones pinpointed by the GSDI’s individual institutional projects, and Metamorphosis’ design addresses these issues.
Table 5. QUICK REFERENCE SUMMARY OF EVALUATION ACTIVITIES

<table>
<thead>
<tr>
<th>TIER ONE: INITIATIVE LEVEL</th>
<th>TIER TWO: PROJECT LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(activities represent overall</td>
<td>(activities vary by project)</td>
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<tr>
<td>project coordination)</td>
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<tr>
<td><strong>GOALS</strong></td>
<td>Goals vary by project; see Table 1 for more detail</td>
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<tr>
<td>1. To prepare students to be</td>
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<tr>
<td>lifelong learners in the</td>
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<tr>
<td>Information Age.</td>
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<tr>
<td>2. To prepare students to be</td>
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<td>effective communicators in</td>
<td></td>
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<tr>
<td>the electronic environment</td>
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<td>3. To increase access to student</td>
<td></td>
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<td>research results.</td>
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<td><strong>FORMATIVE</strong></td>
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<tr>
<td>11. Milestones established to</td>
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<tr>
<td>record initiative growth</td>
<td></td>
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<tr>
<td>and implementation</td>
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<tr>
<td>12. Milestones established to</td>
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<tr>
<td>coordinate project</td>
<td></td>
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<tr>
<td>introduction between</td>
<td></td>
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<tr>
<td>participating institutions</td>
<td></td>
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<tr>
<td>13. Milestones established to</td>
<td></td>
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<tr>
<td>coordinate project</td>
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<tr>
<td>introduction to outside</td>
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<tr>
<td>institutions.</td>
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<tr>
<td><strong>SUMMATIVE</strong></td>
<td></td>
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<tr>
<td>14. Baseline of student attitudes</td>
<td></td>
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<tr>
<td>towards e-publishing etc.</td>
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<tr>
<td>at both participating and</td>
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<tr>
<td>non-participating</td>
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<tr>
<td>institutions (Metamorphosis)</td>
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<tr>
<td>15. With each intervention</td>
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<td>(project introduced to</td>
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<td>population), survey of</td>
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<tr>
<td>attitudes (Metamorphosis)</td>
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<tr>
<td>also will periodically</td>
<td></td>
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<tr>
<td>check attitudes institutions without that intervention</td>
<td></td>
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<tr>
<td>16. Self-archiving activity</td>
<td></td>
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<tr>
<td>analysis.</td>
<td></td>
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<tr>
<td>17. Student research access</td>
<td></td>
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<tr>
<td>analysis.</td>
<td></td>
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<tr>
<td>18. Baseline to establish skill</td>
<td></td>
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<tr>
<td>level prior to intervention.</td>
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<td>19. Each project will be tested</td>
<td></td>
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<tr>
<td>during development for</td>
<td></td>
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<tr>
<td>content appropriateness &amp;</td>
<td></td>
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<tr>
<td>effectiveness.</td>
<td></td>
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<tr>
<td>20. Material will be collected</td>
<td></td>
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<tr>
<td>to assess impact of project after release to population.</td>
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</table>

The technology acceptance research that serves as Metamorphosis’ foundation reflects a theoretical base in many socio-cognitive traditions and research has been conducted based on the theory of reasoned action [60-63], social cognitive theory [64], diffusion of innovations [65] social presence theory and social influence [66]. Each of these threads approaches technology adoption from a different perspective, including, but not limited to, personal motivation, social influence, uncertainty reduction personal efficacy with the technology, as well as the technology's capacity to perform the task [67, 68]. This research has established a basis for studying an individual's reaction to the introduction of new technology from affective, cognitive, and behavioral perspectives.

Metamorphosis (assessing items I4, I5) is based on an interrupted time series design. This allows analysis of the effects of the project over its three-year duration including a comparison to non-participant institutions. First, at the inception of the project, a baseline will be established by surveying attitudes, as
well as knowledge and skills, at representative U.S. institutions including participant institutions. The evaluation will track changes at those institutions, and assess the effects of each type of intervention provided by the GSDI. The interrupted time series design will help control for maturation effects and sensitization and testing effects. The control for history effects will be impacted by the timing used in introducing the interventions. The preferred method of intervention in which the intervention is introduced simultaneously at all sites, would control history effects the most effectively, but this may be moderated by the timetable of product development. The GSDI interrupted time series design evaluation plan does have some limitations in that it does not allow for analysis of how an individual’s attitudes may change over time, or for non-comparability of the different institutions. In order to adjust for non-comparability of institutions, the control group of institutions will be matched as closely as possible to the institutions at which interventions are enacted using key characteristics such as student population demographics and degree programs offered.

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Baseline</td>
</tr>
<tr>
<td>implemented</td>
<td>Intervention #1</td>
</tr>
<tr>
<td>Control</td>
<td>Measure 1</td>
</tr>
<tr>
<td>Intervention</td>
<td>Intervention #2</td>
</tr>
<tr>
<td>Control</td>
<td>Measure 2</td>
</tr>
<tr>
<td>Intervention</td>
<td>Intervention #3</td>
</tr>
<tr>
<td>Control</td>
<td>Measure 3</td>
</tr>
<tr>
<td>Control</td>
<td>Measure 4</td>
</tr>
<tr>
<td>Control</td>
<td>Measure 5</td>
</tr>
</tbody>
</table>

To add a qualitative perspective three flights of focus groups will be conducted at a selection of participating sites. They will be scheduled at the baseline, intervention #2 and follow-up points. While this information may not be applicable to the general population it will add in-depth insight at each of these points which will help provide texture to the quantitative results gathered with the time series evaluation.

Another limitation of the study is that it will be administered with an on-line questionnaire. While this could produce some technological bias, it is a necessary in order to coordinate the evaluation work cost-effectively. However, to reduce the effect of technological bias, the online questionnaire will be designed to be extremely easy to self-administer.

To measure the success of Outcome #3, a quantitative assessment (items I6, I7) of the impact of this project will be obtained through distributed data collection by member universities as well as log analysis from server machines. Evaluation will occur at each project site, and, with their help, at no less than 10 other sites, so that the growth and evolution of the initiative is tracked and improved, with ongoing formative and iterative refinement of project materials.
TIER TWO EVALUATION – Project Level: Brief Narrative

Tier Two evaluation focuses the specific projects being developed at each site. Each site has extensive expertise in research and development and has included some project-specific evaluation into their plans. To maintain consistency among the evaluation being conducted for each of the projects and to enhance the integrity of the GSDI, all sites will engage in the research activities P1-P6 as outlined in the summary table above.

3.10 Summary and Conclusions

One aspect of GSDI is the study of how students learn about, adopt, exploit, and eventually disseminate new technology. Another focus is on developing self-study tutorials and other types of instructional modules for existing software – that allows students to gain greater benefits from applications that many institutions already hold licenses for, but whose features may be substantially underutilized.

A consortium of 5 institutions, led by Virginia Tech, brings vision and expertise to the GSDI. (Please review Table 1 for an overview of the efforts of all project partners.) This program will produce valuable lessons for inter-institutional collaboration when developing components for an integrated project including project communication structure, tips for designing integrative approaches to individual components, and guidance on the portability of ideas across geographic and institutional barriers.

GSDI is a significant “next step” beyond the Networked Digital Library of Theses and Dissertations and a companion to the Open Archives initiative, which aims to establish interoperability between the different digital libraries and repositories that currently warehouse the works of scholars.

GSDI has a national scope, and although it will be focusing on graduate students, many components will benefit postsecondary students at all levels. Eventually, the mechanisms established by GSDI could also be tailored to address undergraduates directly. One aspect that will be explored is whether GSDI related activities impact retention rates and interest in moving on to graduate education. Additionally, because GSDI would impact how students use available technological tools it is likely to have a ripple effect on other students and society. By making these skills part of the educational experience, more communities of citizens will be exposed to the technology and this coterie of people could help diminish some aspects of the digital divide.
## Budget Summary*

### A. Budget Items Requested from FIPSE

<table>
<thead>
<tr>
<th>Direct Costs:</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td>$43,721</td>
<td>45,635</td>
<td>47,636</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>1,650</td>
<td>1,758</td>
<td>1,872</td>
</tr>
<tr>
<td>3. Travel</td>
<td>9,000</td>
<td>9,000</td>
<td>9,000</td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>6. Consultants and Contracts (4 partners @ $18,750/yr)</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>7. Other (tuition)</td>
<td>8,492</td>
<td>8,747</td>
<td>9,009</td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
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<tbody>
<tr>
<td>139,363</td>
<td>141,640</td>
<td>144,017</td>
</tr>
</tbody>
</table>

**Indirect Costs (at 8%):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,149</td>
<td>11,331</td>
<td>11,522</td>
</tr>
</tbody>
</table>

**Total Requested from FIPSE:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$150,512</td>
<td>152,971</td>
<td>155,539</td>
</tr>
</tbody>
</table>

(These figures should appear on the title page)

### B. Project Costs Not Requested from FIPSE (institutional and other support):

<table>
<thead>
<tr>
<th>Direct Costs:</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td>$15,509</td>
<td>16,518</td>
<td>17,592</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>3,877</td>
<td>4,130</td>
<td>4,399</td>
</tr>
<tr>
<td>3. Travel</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Consultants and Contracts (4 partners, total)</td>
<td>202,982</td>
<td>159,058</td>
<td>131,475</td>
</tr>
<tr>
<td>7. Other (Equipment Rental, Printing, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>224,368</td>
<td>181,706</td>
<td>155,466</td>
</tr>
</tbody>
</table>

**Indirect Costs (on all but line 6 above, plus from difference in overhead rate and 8% used above):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>58,508</td>
<td>60,373</td>
<td>61,937</td>
</tr>
</tbody>
</table>

**Total Institutional and Other Support:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$282,876</td>
<td>242,079</td>
<td>217,403</td>
</tr>
</tbody>
</table>

*Budget items, including institutional support figures, must be detailed in the budget narrative of the final proposal.*
Budget Narrative

The following discussion focuses on the support requested and the cost sharing offered by the five universities involved in this project. For the sake of brevity, it does not elaborate on the in-kind cost sharing offers discussed in the support letters in Appendix C (which have considerable value – for example, Adobe will donate software valued at $470 to each university that joins NDLTD).

Each project partner has provided a Budget Summary and Budget Narrative for their portion of the project. These appear on the remaining pages in this section of the proposal.

A. Details on Cost Sharing

This project has a very high level of cost sharing, as can be seen from the following summary table. It should be noted that $742,358, which is 62% of total project costs (i.e., the sum of requested and cost shared funds, namely $1.2M), is furnished as cost sharing.

<table>
<thead>
<tr>
<th>Partner</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT</td>
<td>$ 79,894</td>
<td>$ 83,021</td>
<td>$ 85,928</td>
<td>$ 248,843</td>
</tr>
<tr>
<td>Caltech</td>
<td>$ 41,736</td>
<td>$ 53,661</td>
<td>$ 23,849</td>
<td>$ 119,246</td>
</tr>
<tr>
<td>U. Iowa</td>
<td>$ 19,374</td>
<td>$ 19,878</td>
<td>$ 20,403</td>
<td>$ 59,655</td>
</tr>
<tr>
<td>U. Kentucky</td>
<td>$ 9,377</td>
<td>$ 9,494</td>
<td>$ 9,622</td>
<td>$ 28,493</td>
</tr>
<tr>
<td>USF</td>
<td>$ 132,495</td>
<td>$ 76,025</td>
<td>$ 77,601</td>
<td>$ 286,121</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$ 282,876</td>
<td>$ 242,079</td>
<td>$ 217,403</td>
<td>$ 742,358</td>
</tr>
</tbody>
</table>

Further details on the cost sharing of each partner appear later in this subsection, in their individual Summary and Narrative documents. Virginia Tech cost sharing is explained line by line below, detailing what is shown in the Budget Summary.

VT Project Costs Not Requested from FIPSE:

<table>
<thead>
<tr>
<th>1. Salaries &amp; Wages</th>
<th>15,509</th>
<th>16,518</th>
<th>17,592</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Employee Benefits</td>
<td>3,877</td>
<td>4,130</td>
<td>4,399</td>
</tr>
<tr>
<td>3. Travel</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Co-PIs Fox, Eaton, and McMillan each will work 5% CY on this project, as cost sharing.

Fringes on the cost shared CY salaries of the co-PIs are computed at 25%.

Fox will use $2,000 of the operating budget of the Digital Library Research Laboratory for travel as cost sharing on the project.
These figures are the totals of the “Total Institutional and Other Support” entries for 4 partners. See the last line of their Budget Summary forms, appearing later in this proposal section.

**Total Direct Costs (add 1-7 above):**

<table>
<thead>
<tr>
<th></th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>224,368</td>
<td>181,706</td>
<td>155,466</td>
</tr>
</tbody>
</table>

These figures are totals of lines above.

**Indirect Costs (on all but line 6 above, plus from difference in overhead rate and 8%):**

<table>
<thead>
<tr>
<th></th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>58,508</td>
<td>60,373</td>
<td>61,937</td>
</tr>
</tbody>
</table>

Indirect is computed on the items above, excluding line 6, the subcontract amounts. In addition, shown here is the difference between the indirect that would normally be charged and that requested by FIPSE (which does not consider rates about 8% to be competitive). The indirect rates are 45.5% for the 1st half of year 1, 46% for the 2nd half of year 1 and 1st half of year 2, and 46.2% thereafter.

**Total Institutional and Other Support:**

<table>
<thead>
<tr>
<th></th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>282,876</td>
<td>242,079</td>
<td>217,403</td>
</tr>
</tbody>
</table>

These figures are the totals of direct and indirect.

### B. Details on Budget Summary

To carry out the work detailed in this proposal, this project team requests $459,022 over a three-year period. Roughly half of these funds will be split evenly among the 4 project partners, with the remainder assigned to the lead/coordinating institution, Virginia Tech.

This subsection explains the Virginia Tech or cumulative budget for the project, since the 4 partners’ budgets are simply shown as totals on line 6. Explanation is given line by line, detailing what is shown in the Budget Summary.

**Budget Items Requested from FIPSE**

<table>
<thead>
<tr>
<th>Budget Items Requested from FIPSE</th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Costs:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Salaries &amp; Wages</td>
<td>Fox: 6,601</td>
<td>7,031</td>
<td>7,488</td>
</tr>
<tr>
<td></td>
<td>GRAs: 37,120</td>
<td>38,604</td>
<td>40,148</td>
</tr>
<tr>
<td></td>
<td>Total: 43,721</td>
<td>45,635</td>
<td>47,636</td>
</tr>
</tbody>
</table>

Project Director Fox will work 5% CY throughout the course of the project. Co-PIs Eaton and McMillan will serve with no charge to FIPSE.

Two GRAs will work full-time throughout the course of the project. One will help with project coordination and evaluation. The other will help with developing, packaging, testing, and disseminating educational resources produced at all five universities.

| 2. Employee Benefits               | 1,650 | 1,758 | 1,872 |

Fringes are computed as 25% of the salary for Fox.
3. Travel

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9,000</td>
<td>9,000</td>
<td>9,000</td>
<td></td>
</tr>
</tbody>
</table>

Travel is required for the 3 co-PIs and two GRAs, to attend meetings with partners, the annual ETD conference, events hosted by CNI and other supporters, and to visit interested universities. Travel also covers the annual FIPSE meeting.

4. Materials and Supplies

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td></td>
</tr>
</tbody>
</table>

Materials and supplies cover tapes and disks and other media used to disseminate results, as well as to backup files.

5. Contracts (4 partners @ $18,750/yr)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
<td></td>
</tr>
</tbody>
</table>

Each partner provided a subcontract proposal for this amount, as explained in following pages, through their Budget Summary and Budget Narrative pages.

6. Other (tuition)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8,492</td>
<td>8,747</td>
<td>9,009</td>
<td></td>
</tr>
</tbody>
</table>

Tuition must be covered for all graduate students working on funded research.

**Total Direct Costs (add 1-7 above):**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>139,363</td>
<td>141,640</td>
<td>144,017</td>
<td></td>
</tr>
</tbody>
</table>

These figures are the totals of the detail lines given above.

**Indirect Costs:**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11,149</td>
<td>11,331</td>
<td>11,522</td>
<td></td>
</tr>
</tbody>
</table>

Indirect is computed at 8%. The rest of the indirect usually charged is cost shared.

**Total Requested from FIPSE:**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>150,512</td>
<td>152,971</td>
<td>155,539</td>
<td></td>
</tr>
</tbody>
</table>

These figures are the totals of the Total Direct Costs and Indirect Costs, above.
# Caltech Budget Summary*

### A. Budget Items Requested from FIPSE

**Direct Costs:**

1. Salaries & Wages (Professional and Clerical)  
   - Year 1: $5,000 Undergrad. Wages
2. Employee Benefits
3. Travel  
   - Year 1: $2,750  
   - Year 2: $2,750  
   - Year 3: $4,000
4. Equipment (Purchase)
5. Materials and Supplies  
   - Year 1: $6,455  
   - Year 2: $3,241  
   - Year 3: $7,338
6. Consultants and Contracts  
   - Year 1: $6,836  
   - Year 2: $6,870  
   - Year 3: $1,023
7. Other (Equipment Rental, Printing, etc.)  
   - Year 1: $1,320  
   - Year 2: $4,500

**Total Direct Costs (add 1-7 above):**  
- Year 1: $17,361  
- Year 2: $17,361  
- Year 3: $17,361

**Indirect Costs:**  
- Year 1: $1,389  
- Year 2: $1,389  
- Year 3: $1,389

**Total Requested from FIPSE:**  
(These figures should appear on the title page)  
- Year 1: $18,750  
- Year 2: $18,750  
- Year 3: $18,750

### B. Project Costs Not Requested from FIPSE  
(institutional and other support):

1. Salaries & Wages (Professional and Clerical)  
   - Year 1: $21,849  
   - Year 2: $28,080  
   - Year 3: $12,480
2. Employee Benefits  
   - Year 1: $4,914  
   - Year 2: $6,318  
   - Year 3: $2,808
3. Travel
4. Equipment (Purchase)
5. Materials and Supplies
6. Consultants and Contracts
7. Other (Equipment Rental, Printing, etc.)

**Total Direct Costs (add 1-7 above):**  
- Year 1: $26,754  
- Year 2: $34,398  
- Year 3: $15,288

**Indirect Costs:**  
- Year 1: $14,982  
- Year 2: $19,263  
- Year 3: $8,561

**Total Institutional and Other Support:**  
- Year 1: $41,736  
- Year 2: $53,661  
- Year 3: $23,849

*Budget items, including institutional support figures, must be detailed in the budget narrative of the final proposal.*
Caltech Budget Narrative

Year One:

Materials, 40 Gb capture storage, array and media discs, CD and DVD and DV cam tape will be acquired in the first year. Contractor fees of the Digital Media Center billed at $30/hr. will cover the effort of encoding, technical editing, assembly and deployment preparation for the various media elements. Travel for two to coordination meetings. The Institutional commitment is reflected in staff time for the intellectual and creative design work and technical support for database management and CGI scripting within the library’s web environment.

<table>
<thead>
<tr>
<th>Direct Costs:</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td></td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td></td>
</tr>
<tr>
<td>3. Travel</td>
<td>$2,750</td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td>$6,455</td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td>$6,836</td>
</tr>
<tr>
<td>7. Other (Equipment Rental, Printing, etc.)</td>
<td>$1,320</td>
</tr>
<tr>
<td>Total Direct Costs (add 1-7 above):</td>
<td>$17,361</td>
</tr>
</tbody>
</table>

Indirect Costs | $1,389

Total Requested from FIPSE | $18,750

(These figures should appear on the title page)

| Project Costs Not Requested from FIPSE (institutional and other support): |
|-------------------------------------------|--------|
| 1. Salaries & Wages (Professional and Clerical) | $21,840|
| 2. Employee Benefits 22.5%                  | $4,914 |
| 3. Travel                                   |        |
| 4. Equipment (Purchase)                     |        |
| 5. Materials and Supplies                   |        |
| 6. Consultants and Contracts                |        |
| 7. Other (Equipment Rental, Printing, etc.) |        |
| Total Direct Costs (add 1-7 above):         | $26,754|

Indirect Costs: | $14,982

Total Institutional and Other Support | $41,736

Year Two:

Equipment for filming 10 interviews will be rented: DV camera, lighting and audio kit. The cinematographer will be paid a minimal honorarium. The Digital Media Center fees of $30/hr. for final assembly and deployment. The staff time to conduct the interviews and finalize the product is slightly more than during the first year.
Year 2

Direct Costs:
1. Salaries & Wages (Professional and Clerical)
2. Employee Benefits
3. Travel $2,750
4. Equipment (Purchase)
5. Materials and Supplies $3,241
6. Consultants and Contracts $6,870
7. Other (Equipment Rental, Printing, etc.) $4,500
Total Direct Costs (add 1-7 above): $17,361
Indirect Costs: $1,389
Total Requested from FIPSE (These figures should appear on the title page) $18,750

Project Costs Not Requested from FIPSE (institutional and other support):
1. Salaries & Wages (Professional and Clerical) $28,080
2. Employee Benefits 22.5% $6,318
3. Travel
4. Equipment (Purchase)
5. Materials and Supplies
6. Consultants and Contracts
7. Other (Equipment Rental, Printing, etc.)
Total Direct Costs (add 1-7 above): $34,398
Indirect Costs: $19,263
Total Institutional and Other Support (These figures should appear on the title page) $53,661

Year Three:
The travel budget is increased to support necessary travel to coordinate expanding the program to other universities and to complete the evaluation phase. The duplication of product and survey instruments also needs to be supported.

Direct Costs:
1. Salaries & Wages (Professional and Clerical) $5,000
2. Employee Benefits
3. Travel $4,000
4. Equipment (Purchase)
5. Materials and Supplies $7,338
6. Consultants and Contracts $1,023
7. Other (Equipment Rental, Printing, etc.)
Total Direct Costs (add 1-7 above): $17,361
Indirect Costs: $1,389
Total Requested from FIPSE (These figures should appear on the title page) $18,750

Project Costs Not Requested from FIPSE (institutional and other support):
1. Salaries & Wages (Professional and Clerical) $12,480
2. Employee Benefits 22.5% $2,808
3. Travel
4. Equipment (Purchase)
5. Materials and Supplies
6. Consultants and Contracts
7. Other (Equipment Rental, Printing, etc.)
Total Direct Costs (add 1-7 above): $15,288
Indirect Costs: $8,561
Total Institutional and Other Support (These figures should appear on the title page) $23,849
Digital Media Center

The Digital Media Center is a key facility whose services will be paid for in this project. It provides specialized tools and equipment for working with digital media and for producing multimedia products and presentations. The Media Center houses seven specially equipped and configured workstations, each dedicated to a different area of media computing: (1) graphics and image processing, (2) interactive authoring, publishing and presentation, (3) digital video, (4) web development, (5) 3D rendering and animation, and (6) general media computing. The Center also provides specialized input and output tools, including devices for high-quality slide and flatbed scanning, photographic-quality print output, capturing from and recording to videotape, and recording to compact disc. Also available are a wide assortment of software tools for producing, editing, presenting, and distributing digital media materials; these include tools for doing conventional drawing, PostScript illustration, image manipulation, titling and animation, graphs and charts, audio recording, and so on. Last of all, the Digital Media Center provides the Caltech community with a resource for information, advice, and self-instructional materials on subjects related to digital media technology and multimedia production.

Media Center workstations include two Silicon Graphics O2 machines, six Macintosh PowerPCs and a Dell Pentium PC. Machines are equipped with abundant RAM memory and disk storage, dual-monitor high-resolution displays, CD-ROM player with support for PhotoCD, and a suite of software appropriate to each workstation's particular function. Individual workstations are also equipped with additional boards and peripherals depending on their function. For example, the modeling, rendering, and animation workstation is configured with acceleration hardware for fast 2D and 3D graphics operations. The video production workstation is outfitted with a Radius digital video system, an 18GB disk array, and device control software for controlling a professional-level Digital Video (DV) and S-VHS video system with NTSC output monitor. The graphics & image processing workstation is equipped with a high-resolution reflective/transparency Epson scanner and a Fujix photographic printer.

The Digital Media Center provides numerous ways for getting data to and from the Center and for moving large work files from one computer to another within the Center. You will also find 100MB Zip and 1GB Jaz drives which allow easy station-to-station data transport. In addition, workstations are connected via 100mbps Ethernet to the campus network and can be used to access the ITS Unix cluster and other resources on the Internet. Xinet's Unix file server and print spooling software is also available enabling the Center's Macintoshes and SGIs to easily share files and resources with one another.

The Digital Media Center has helped produce materials and presentations for a wide variety of faculty, staff, and students throughout the Institute from Seismology, Biology, Chemical Engineering, Aeronautics, Physics, Humanities, Geology, Electrical Engineering, USGS, the Library, Development, Periodicals, Carnegie Observatories, and elsewhere. Projects have ranged from the production of computer-generated media for Watson Lectures to the video recording of visualizations and simulations for use at conferences to the creation of computer-based teaching materials to the enhancement and preparation of digital images for publication.
## University of Iowa Budget Summary*

### A. Budget Items Requested from FIPSE

<table>
<thead>
<tr>
<th>Direct Costs:</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td>$14,130</td>
<td>$14,695</td>
<td>$15,283</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>$989</td>
<td>$1,029</td>
<td>$1,078</td>
</tr>
<tr>
<td>1. Travel</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td>$1,242</td>
<td>$637</td>
<td></td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Other (Equipment Rental, Printing, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$17,361</td>
<td>$17,361</td>
<td>$17,361</td>
</tr>
</tbody>
</table>

**Indirect Costs:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,389</td>
<td>$1,389</td>
<td>$1,389</td>
</tr>
</tbody>
</table>

**Total Requested from FIPSE:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$18,750</td>
<td>$18,750</td>
<td>$18,750</td>
</tr>
</tbody>
</table>

(These figures should appear on the title page)

### B. Project Costs Not Requested from FIPSE

<table>
<thead>
<tr>
<th>Institutional and Other Support:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
</tr>
<tr>
<td>3. Travel</td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
</tr>
<tr>
<td>6. Other (Equipment Rental, Printing, etc.)</td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8,574</td>
<td>$8,917</td>
<td>$9,274</td>
</tr>
</tbody>
</table>

**Indirect Costs:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,800</td>
<td>$10,961</td>
<td>$11,129</td>
</tr>
</tbody>
</table>

**Total Institutional and Other Support:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$19,374</td>
<td>$19,878</td>
<td>$20,403</td>
</tr>
</tbody>
</table>

*Budget items, including institutional support figures, must be detailed in the budget narrative of the final proposal.
University of Iowa Budget Narrative

Year One Budget
Software supporting instructional design and development. Staffing (one graduate Research Assistant) to assist in preparing group and individual instructional modules for students and tutorials for faculty. Travel for coordination meetings.

Year Two Budget
Staffing to assist in refining instructional modules and for gathering evaluative information from students and mentors. Travel for coordination meetings.

Year Three Budget
Travel for coordination meetings and to expand the program to other universities. Continue gathering and analyzing evaluative information from students and faculty mentors.

Budget Detail

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Salaries &amp; Wages</td>
<td>14,130</td>
<td>14,695</td>
<td>15,283</td>
</tr>
<tr>
<td>Graduate student – stipend of $14,130 based on graduate student union contract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>989</td>
<td>1,029</td>
<td>1,078</td>
</tr>
<tr>
<td>Fringe benefit rate for graduate students is 7% of stipend</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Travel</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>One trip each year of the project to meet with project director</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td>1,242</td>
<td>637</td>
<td></td>
</tr>
<tr>
<td>Software purchases, disks, etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct Costs (add 1 – 7 above):</td>
<td>17,361</td>
<td>17,361</td>
<td>17,361</td>
</tr>
<tr>
<td>Indirect Costs (8%)</td>
<td>1,389</td>
<td>1,389</td>
<td>1,389</td>
</tr>
<tr>
<td>Total Requested from FIPSE</td>
<td>18,750</td>
<td>18,750</td>
<td>18,750</td>
</tr>
<tr>
<td>Project Costs Not Requested from FIPSE (institutional and other support)</td>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>1. Salaries &amp; Wages</td>
<td>6,570</td>
<td>6,833</td>
<td>7,107</td>
</tr>
<tr>
<td>William Welburn @ 10% effort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Employee Benefits 30.5%</td>
<td>2,004</td>
<td>2,084</td>
<td>2,167</td>
</tr>
<tr>
<td>3. Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Other (Equipment Rental, Printing, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct Costs (add 1 – 7 above):</td>
<td>8,574</td>
<td>8,917</td>
<td>9,274</td>
</tr>
<tr>
<td>Indirect Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on federally negotiated rate; 47% of total direct costs less portion requested from US Department of Education</td>
<td>10,800</td>
<td>10,961</td>
<td>11,129</td>
</tr>
<tr>
<td>Total Institutional and Other Support (These figures should appear on the title page)</td>
<td>19,374</td>
<td>19,878</td>
<td>20,403</td>
</tr>
</tbody>
</table>
**USF Budget Summary***

**A. Budget Items Requested from FIPSE**

<table>
<thead>
<tr>
<th>Direct Costs:</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td>$5681</td>
<td>4861</td>
<td>6750</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>$2500</td>
<td>2500</td>
<td>5000</td>
</tr>
<tr>
<td>3. Travel</td>
<td>$1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td>$1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td>$5000</td>
<td>5000</td>
<td>3000</td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td>$3000</td>
<td>5000</td>
<td>4000</td>
</tr>
<tr>
<td>7. Other (Equipment Rental, Printing, etc.)</td>
<td>$17361</td>
<td>17361</td>
<td>17361</td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

| Indirect Costs:                                                               | $1389  | 1389   | 1389   |

**Total Requested from FIPSE:**

(These figures should appear on the title page)

| $18750 | $18750 |

**B. Project Costs Not Requested from FIPSE (institutional and other support):**

<table>
<thead>
<tr>
<th>Total Direct Costs (add 1-7 above):</th>
<th>$28,598</th>
<th>29,456</th>
<th>30,340</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salaries &amp; Wages (Professional and Clerical)</td>
<td>$6,578</td>
<td>6,775</td>
<td>6,978</td>
</tr>
<tr>
<td>2. Employee Benefits</td>
<td>$1,200</td>
<td>1,200</td>
<td>1,200</td>
</tr>
<tr>
<td>3. Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Equipment (Purchase)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Materials and Supplies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Consultants and Contracts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7a. Microsoft Cash Contribution – already received</td>
<td>$40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7b. Other (Computer Classroom Rental in Engineering)</td>
<td>$15,000</td>
<td>15,000</td>
<td>15,000</td>
</tr>
</tbody>
</table>

**Total Direct Costs (add 1-7 above):**

| Indirect Costs:                                                               | $41,119| 23,594| 24,083|

**Total Institutional and Other Support:**

| $132,495 | $76,025 | $77,601 |

*Budget items, including institutional support figures, must be detailed in the budget narrative of the final proposal.
USF Budget Narrative

Year 1, Planning, Material gathering, Design and Prototype Production
The Institutional commitment is reflected in faculty members’ time for the intellectual and creative work. Participating faculty are eager to commit a significant part of their creative time, expecting this project to facilitate electronic theses and dissertations at USF and other universities. Also, the university will provide a computer classroom, support from Instructional Technologies to develop a high-end Flash website, a Microsoft Theater Server, two Exchange Servers, Winnov multimedia cameras, and computer equipment. From FIPSE, we seek funds to pay for one research assistant, and contractor fees to pay for the encoding, technical editing, assembly and deployment preparation for the various media elements, including for example, videos of our successful graduate students and faculty’s efforts at creating multimedia theses and dissertations. One digital camcorder will be purchased. Software tools for writers will be purchased as needed. Travel for two to coordination meetings.

Year 2, Deployment of Training Materials
Year two reflects the same institutional commitment, use of faculty members’ creative time, software assessment, and travel. In year two we will use the University of Kentucky’s and our assessment information to refine the training tools, reference materials, and software tools. In year 2, we expect to extend our timeline of the milestones graduate students’ face as writers, particularly in the areas of visual rhetoric, tool development, and navigational principles for hypertextual writing. However, in year 2, we expect to focus more on developing resources for faculty and administrators so that they understand the value of the resources we develop in year 1 for students.

Year 3, Evaluation and Refinement
We will use our training materials, tools and reference materials at the other four participants’ campuses. Evaluation of our resource environment will continue. Project members will disseminate project results at appropriate academic conferences. The travel budget is increased to support necessary travel to coordinate expanding the program to other universities and to complete the evaluation phase. The duplication of product and survey instruments also needs to be supported.

Explanation of Salaries Provided by USF

<table>
<thead>
<tr>
<th>Investigator</th>
<th>99/2000</th>
<th>2000/2001w/2.5% S. I.</th>
<th>In-Kind Yr 1</th>
<th>Benefits Yr 1</th>
<th>In-Kind Yr 2</th>
<th>Benefits Yr 2</th>
<th>In-Kind Yr 3</th>
<th>Benefits Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. MOXLEY</td>
<td>0.1</td>
<td>65465</td>
<td>67102</td>
<td>6710</td>
<td>1543</td>
<td>6911</td>
<td>1590</td>
<td>7119</td>
</tr>
<tr>
<td>T. BEAVERS</td>
<td>0.05</td>
<td>55122</td>
<td>56500</td>
<td>2825</td>
<td>650</td>
<td>2910</td>
<td>669</td>
<td>2997</td>
</tr>
<tr>
<td>B. COCHRANE</td>
<td>0.1</td>
<td>73054</td>
<td>74880</td>
<td>2825</td>
<td>650</td>
<td>2910</td>
<td>669</td>
<td>2997</td>
</tr>
<tr>
<td>R. COLLINS</td>
<td>0.1</td>
<td>78870</td>
<td>80842</td>
<td>2825</td>
<td>650</td>
<td>2910</td>
<td>669</td>
<td>2997</td>
</tr>
<tr>
<td>I. FRANK</td>
<td>0.05</td>
<td>47719</td>
<td>48912</td>
<td>2446</td>
<td>562</td>
<td>2519</td>
<td>579</td>
<td>2595</td>
</tr>
<tr>
<td>M/ SALMOND</td>
<td>0.03</td>
<td>34000</td>
<td>34850</td>
<td>1046</td>
<td>240</td>
<td>1077</td>
<td>248</td>
<td>1109</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>28598</td>
<td>6578</td>
<td>29456</td>
<td>6775</td>
<td>30340</td>
</tr>
</tbody>
</table>
Appendix

A. USF Team’s Outline of Training Materials

B. Biographical Sketches of Key Project Staff

C. Support Letters

D. NDLTD Membership, Growth, and Access

E. References
Appendix A. USF Team’s Outline of Training Materials

Graduate Student Resource Environment (Draft)

Introduction
- Why Create an ETD? (Moxley)
- What is the NDLTD? (Moxley)
- Case Studies of Notable ETDs: Science, Engineering, Business (Moxley, Callahan, Collins, Cochrane)

Administrative Issues
- Campus Leadership, Partnering & Interdisciplinarity
- What training does your campus need to provide to network administrators, faculty, and graduate students? (Beavers)
- What can you tell Systems Administrators to Get Their Support? (Beavers)

Prewriting
- Scholarship as a conversation: listservs, conferences, websites, publications (Moxley)
- Maintain a Writing and Research Notebook (Moxley)
- Connect coursework with research (Moxley)
- Develop a research question, a theses or dissertation proposal (Moxley)
- Remote Realtime Collaboration (Beavers)
- Annotated Bibliography Toolsets: Overview of Proprietary Software Tools (Frank and Collins)

Collaborating
- Using Word’s commenting, inline editing, versions, and tracking features (Moxley)
• Using Internet Explorer’s Discussion features (Moxley)
• Using Front Page to create discussion forums (Moxley)
• Real-time collaboration and discussions (Beavers)
• Netmeeting and web discussions (Beavers)

Information Management

• Using Outlook to manage your information
• Using Word’s Outlining Tool

Writing

• Which Tool Works Best for Your Thesis or Dissertation? An overview of authoring tools and reference help, including Word, FrontPage, Access, Excel, Adobe PDF (Moxley)
• Multimedia Video: PowerPoint and Word (Callahan)
• Multimedia Video: Streaming Multimedia: Netshow (Beavers)
• PowerPoint: Academic Writing and Publishing (Moxley)
• Graphics 101 and Visual Rhetoric (TBA)
• PowerPoint: Online Style & Visual Rhetoric (Moxley)
• Word: Format: Header Manager, Footnote Manager.
• Principles of Online Style
• Web Site: Writing and Researching Online (Moxley)

Choose a Methodology

• Overview of Research Methodologies

Acquiring and Interpreting Data
Students, especially in the sciences, are often required to gather and organize data from a variety of disparate sources. For example, a field biologist may have data gathered in the field—observations, geographic and physical data— that needs to be integrated with genetic, physiological and morphological data gathered in the field. We will use existing applications—database management tools and Web database access software—to develop fully customizable systems that can be adapted to the needs of a particular project. By taking a web-based approach, we can incorporate the flexibility to include real-time entry of field data, any time any place access to data, and sharing of data with collaborators, and mentors.

- Search Engines, Boolean Searches, and Intelligent Agents (Frank)
- Collection and Analysis of Qualitative Data (Collins)
- Collection and Analysis of Quantitative Data (Collins)
- Using Pivot Tables and other Office 2000 tools to Promote Reader Interaction (Cochrane)
- Using Access for Compiling and Analyzing Field Data (Cochrane)
- Using GPS with Office 2000 (Cochrane)

Data Integration

A cost of the creativity that drives today’s software industry is that independently developed applications can often be difficult to integrate. An example that we will focus on is Geographical Information Systems (GIS). For the professional geographer, the industry standard (ArcView/ArcInfo, ESRI, Inc.) provides enormous power, but the complexity of these packages are a barrier to the more casual user. Furthermore, it can be difficult to integrate data from other applications (for example Microsoft Access) with GIS-generated datasets.

To address these problems, we will explore how the evolving capabilities of GIS can be exploited in a straightforward fashion to accomplish two broad goals. First, we will identify those tools that allow a
student to easily post map data generated with GIS to the web in an interactive fashion. In so doing, our objective will be to design systems that obviate the need for any programming on the part of the student. Second, we will determine how best data contained in other sources can be incorporated into such a published GIS project. For example, using the example of the field biologist again, we envision her being able to easily publish a GIS-generated map on the web, which contains links to whatever data have been gathered from whatever source at sampling locations included in the map.

**Data Sharing and Collaboration**

As graduate education becomes more interdisciplinary and global in scope, students will find themselves needing to avail themselves of feedback from experts in a broad variety of fields and from a wide assortment of institutions. The Web provides the obvious infrastructure for facilitating this, and modern office productivity suites (Office 2000, Star Office 5.1) include many tools that facilitate web-based collaboration. We will develop wizards that will help students address the following questions:

- What data needs to be shared?
- In what form should it be shared?
- With whom should it be shared? More specifically
  - Establishing security permissions should be straightforward
  - Within the group involved in a particular project, access for each individual involved should be easy and tailored to his or her role in the project
  - The degree to which an individual can work interactively with data should be set according to the particular role of that person.
• How can these data best be incorporated into an ETD?

Finally, having developed the means whereby students can organize their own collaborative systems, we will provide targeted information as to how data collected in such applications as spreadsheets and databases can be most effectively published to the Web for sharing with contributors and collaborators.

Reference Management

• Creating an annotated bibliography

• Citation Tools
  1. Word to Bibliocite (Metz-Wiseman)
  2. Word to Endnote (Frank)

References

Index

Extended Contents for CD ROM

The CD will provide an online version of the printed text. In addition, it will include samples, illustrations, macros, and tutorials.

Wizards

• The structure wizard.
  1. The structure wizard creates a research proposal, a thesis, and dissertation. For longer documents, it would have a document planner for each chapter as well as the whole. (Moxley and Beavers)

• The bibliography wizard.
2. The bibliography wizard would enable students to enter key bibliographical information, a summary, a paraphrase, or a direct quote. Students would benefit from this wizard because it would help them integrate fieldwork, research, and scholarship in their disciplines.

- The daily writing wizard (Moxley, Collins, and Beavers)

3. The daily writing wizard would work within Outlook.

Macros

- The formatting macro streamlines the USF graduate school's formatting conventions and requirements. This enables students to apply a template to their content, thereby saving them time. This template will provide a sample that other universities can adopt. (Collins)

- The glossary macro creates glossaries on the fly. (Sullivan)

- This index macro improves on Word's indexing feature, making it easier to index multiple documents. (Sullivan)
Appendix B. Biographical Sketches of Key Project Staff

<table>
<thead>
<tr>
<th>Institution</th>
<th>Team Member</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia Tech</td>
<td>John Eaton</td>
<td>Associate Provost for Graduate Studies</td>
</tr>
<tr>
<td></td>
<td>Edward Fox (PI)</td>
<td>Director, Digital Library Research Laboratory</td>
</tr>
<tr>
<td></td>
<td>Gail McMillan</td>
<td>Director, Digital Library and Archives, University Libraries</td>
</tr>
<tr>
<td>Caltech</td>
<td>Anne Buck</td>
<td>University Librarian</td>
</tr>
<tr>
<td></td>
<td>Kimberly Douglas</td>
<td>Director, Library of Engineering and Applied Science</td>
</tr>
<tr>
<td></td>
<td>Richard Flagan</td>
<td>Professor of Chemical Engineering</td>
</tr>
<tr>
<td></td>
<td>Eric Van de Velde</td>
<td>Director of Library Information Technology</td>
</tr>
<tr>
<td></td>
<td>Wayne Waller</td>
<td>Head, Digital Media Center</td>
</tr>
<tr>
<td></td>
<td>Mark Woods</td>
<td>Director of Photography (independent)</td>
</tr>
<tr>
<td>U. Iowa</td>
<td>Leslie Sims</td>
<td>Dean, Graduate College; Professor of Chemistry</td>
</tr>
<tr>
<td></td>
<td>William Welburn</td>
<td>Assistant Dean, Graduate College</td>
</tr>
<tr>
<td>U. Kentucky</td>
<td>Suzie Allard</td>
<td>UK Presidential Fellow, Communication and Information Studies Doctoral Program</td>
</tr>
<tr>
<td></td>
<td>Lois Chan</td>
<td>Professor, School of Library and Information Science</td>
</tr>
<tr>
<td>USF</td>
<td>Terry Beavers</td>
<td>Technology Assessment Coordinator, Information Technologies</td>
</tr>
<tr>
<td></td>
<td>Anita Callahan</td>
<td>Associate Professor, Industrial and Management Systems Engineering</td>
</tr>
<tr>
<td></td>
<td>Bruce Cochrane</td>
<td>Director, Interdisciplinary Studies Program; Professor of Biology</td>
</tr>
<tr>
<td></td>
<td>Rosann Collins</td>
<td>Assistant Professor, Management Information Systems</td>
</tr>
<tr>
<td></td>
<td>Ilene Frank</td>
<td>University Librarian</td>
</tr>
<tr>
<td></td>
<td>Joseph Moxley</td>
<td>Professor of English</td>
</tr>
<tr>
<td></td>
<td>Michael Salmond</td>
<td>Multimedia and Internet Applications Specialist, Information Technologies</td>
</tr>
</tbody>
</table>
Resume

Name  John L. Eaton  

Date  January 13, 1999

Present Position:  Associate Provost for Graduate Studies and Professor of Entomology

A. Professional Preparation

Undergraduate

University of Illinois, Urbana, B. S., Entomology, 1962.

Graduate

University of Illinois, Urbana, Ph.D. Entomology, 1966.

Appointments:

Virginia Tech

Associate Provost for Graduate Studies 1995-Present

Acting Dean of the Graduate School 1992-1993

Associate Dean of the Graduate School, 1988-1995

Professor of Entomology, 1987-Present

Associate Professor of Entomology, 1976-1986

Assistant Professor of Entomology, 1969-1974.

Kalamazoo College

Assistant Professor of Biology, 1966-1969

c. Publications:


Summary: Books 1, Book Chapters 1, Refereed Publications 37, Symposia Proceedings 1, Teaching Publications 2, Book reviews 1.

d. Synergistic Activities

Responsibilities of the Associate Provost for Graduate Studies:

Promoting graduate programs;

Guidance of the graduate admissions and plans and clearances process;

Implementing, reviewing and improving policies and procedures related to maintaining quality graduate programs;

Serve as liaison between the graduate students and the university to enhance the quality of their graduate school experience.

Work through the Council of Graduate Schools and the Conference of Southern Graduate Schools to advance graduate education in the southeast and the nation.

Activities Specific to the Electronic Thesis and Dissertation (ETD) Project:

Participant or leader for in numerous informational presentations to CNI, the SURA Monticello library project, the Council of Graduate Schools and the Conference of Southern Graduate Schools and at U.S. Universities.

Leader for the Graduate School at Virginia Tech to develop and promote the ETD concept. Provided leadership to get the ETD proposal approved by the Graduate School administration and the Commission on Graduate Studies and Policies.

Currently leading the organization of ETD training workshops for Virginia Tech graduate students.

e. Collaborators and Other Affiliations

i. Collaborators:
Edward Fox, Professor of Computer Science, Virginia Tech
Gail McMillan, Associate Professor, Library, Virginia Tech

ii. Graduate Advisor
James G. Sternburg, Professor of Entomology (Ret) University of Illinois, Urbana

iii. Advisees and Post Docs
Member 32 M.S. Committees, 1969-1988
Member 33 Ph.D. Committees, 1969-1988
Major Professor for 4 M.S. students.
Major Professor for 4 Ph.D. students
Advisor for two Post Docs Abt. 1976
A. VITAE

EDUCATION:

8/83 Ph.D.  Computer Science, Cornell University
1/81 M.S.  Computer Science, Cornell University
2/72 B.S.  Electrical Engineering (Computer Science Option), M.I.T.

RECENT EMPLOYMENT:

1/98-  Director, Digital Library Research Laboratory, VPI&SU (Virginia Tech)
6/90-  Associate Director for Research, VPI&SU (Virginia Tech) Computing Center
4/95-  Professor, Dept. of Computer Science, VPI&SU (Virginia Tech),
       660 McBryde Hall, Blacksburg VA 24061-0106 USA
5/88-4/95  Associate Professor, Dept. of Computer Science, VPI&SU
9/83-5/88  Assistant Professor, Dept. of Computer Science
          Virginia Polytechnic Institute and State University

PROFESSIONAL SERVICE:

CURRENT (Selected):
Director, Internet Technology Innovation Center at Virginia Tech
Director, Networked Digital Library of Theses and Dissertations (http://www.ndltd.org)
Director, Curriculum Resources in Interactive Multimedia (http://ei.cs.vt.edu/~crim/)
Co-Principal Investigator, Computer Science Teaching Center (http://www.cstc.org)
Member: SIGMM Education Committee (co-chair); ACM Content Steering Committee; Advisory Board for D-Lib Forum; Curriculum 2001 Review Committee; NRC Committee to prepare “On Being a Researcher in the Digital Age”; Governing Board Internet Technology Innovation Center
Editor, Morgan Kaufmann Publishers, Inc. Series on Multimedia Info. and Systems
Founding Co-Editor-in-Chief, ACM Journal of Educational Resources in Computing (JERIC, proposed)

RECENT (Selected):
Program chair, 1999 Virginia Internet Week, Blacksburg, VA, September 13-17, 1999
Program chair, ACM Digital Libraries '99; ACM Digital Libraries '96; ACM SIGIR '95
Member: OCLC Research Advisory Council; SIGIR Educ Comm, SIGMM Education Comm (co-chair);
Networked CS Technical Reference Library (NCSTRL, http://www.ncstrl.org) working group
Chair, ACM SIGIR (Special Interest Group on Information Retrieval), 1991-95
Vice Chair, ACM SIGIR (Special Interest Group on Information Retrieval), 1987-91
Editor-in-chief ACM Press Database and Electronic Products, 1988-91
Program committee member: ACM DL '96-98; ACM Multimedia '93-96,98-99; ACM SIGIR '89-99;
       ASIS 1999 Midyear; CIKM’99; CoLIS 3 (1999); ICON’99; ICSC’99; MIS’99

GRANTS/CONTRACTS: Over 60 proposals funded for over $7M since 1983
TUTORIALS: Over 35: digital libraries, hypertext, information retrieval, multimedia, ...
ORAL PRESENTATIONS: Over 150 besides those with publications
**B. PUBLICATIONS** (over 150, including):

**PUBLICATIONS (Selected Related):**


**PUBLICATIONS (Selected Other):**


**C. COLLABORATORS IN RECENT YEARS (see also D below):**


**D. GRADUATE STUDENTS IN RECENT YEARS:**


**E. OWN ADVISOR:** G. Salton (deceased)
GAIL MCMILLAN

University Libraries, Virginia Polytechnic Institute and State University, 1982 to date

APPOINTMENTS

Associate Professor, 1993 to date
Director, Digital Library and Archives, July 1999 to date
Director, Scholarly Communications Project, 1994 - June 1999
Head, Special Collections Department, July 1995 - June 1999
Assistant Professor, 1986-1993
Team Leader, Serials Cataloging/Online Maintenance, 1981-1994
Instructor, 1982-1986
Coordinator, Serials Retrospective Conversion, 1983-1985
Assistant Serials Cataloger, Serials Department, 1982

PROFESSIONAL PREPARATION

University of Maryland, College Park emphasis: rare books, manuscripts, archives MLS 1981
University of Maryland, College Park emphasis: early American history MA 1981
University of California, Riverside major: American history; minor: education BA 1972

SELECTED PUBLICATIONS (first 5 are most closely related)


**SELECTED INVITED PRESENTATIONS**


"Electronic Theses and Dissertations: Eliminating Borders" for the 1999 Rare Books and Manuscripts Conference: Border Crossings: Exploring New Territories for Special Collections, June 22, 1999, McGill University, Montreal, Quebec, Canada.

"Strategie sur la bibliothèque virtuelle dans le contexte actuel: "Library Services and Resources for the University Community" for the Séminaire residentiel de formation à l'intention de directeurs de grandes bibliothèques Suisse, Jongny, Switzerland, Oct. 23, 1998.


ANNE M. BUCK
University Librarian

California Institute of Technology (Pasadena, CA) 1995 to Present

University Librarian
Direct the activities of the fully integrated Caltech Library System. As a member of the Caltech faculty, exert leadership in deliberations on the future of scholarly communication at Caltech. Provide vision for the development of advanced library information systems; contribute to the planning and evaluation of innovative, cost-effective library services; and participate actively in state and national information industry organizations and associations.

New Jersey Institute of Technology (Newark, NJ) 1991 to 1995

University Librarian

Bellcore (Bell Communications Research, Inc.)

Director, Human Resources Planning (Livingston, NJ) 1989 to 1991

Director, Bellcore Library Network (Morristown, NJ) 1984 to 1989

AT&T Bell Laboratories

Group Supervisor, General/Building Services (North Andover, MA) 1983 to 1984

Group Supervisor, Technical Library (Reading, PA) 1979 to 1983

Technical Reference Librarian, Technical Library (Naperville, IL) 1977 to 1979

TEACHING EXPERIENCE
Rutgers University, School of Communication, Information and Library Studies (New Brunswick, NJ)

Adjunct Professor, Services in Special Libraries (3 credit hours) 1989

University of Wisconsin-Madison School of Library and Information Studies, Continuing Education Service (Madison, WI)

Instructor, Advanced Topics in Special Library Management (1.5 CEUs) 1990

Instructor, Management Topics for Special Libraries (1.5 CEUs) 1988

PUBLICATIONS AND PRESENTATIONS


“Books, Bytes and Buckaroos.” Talk presented at the Sixth Annual meeting of the Caltech Professional Advisors, Pasadena, CA  5 March 1997.


PROFESSIONAL ASSOCIATIONS
Women in Engineering Programs and Advocates Network, 1999-Present

Engineering Information Foundation, Vice-President, 1995-Present

American Society for Engineering Education, 1992-Present


American Society for Information Science, 1977-Present; Treasurer, 1992-Present; Chairman, NJ/ASIS Chapter, 1987-1988 (Chapter of the Year Award, 1988)

American Library Association, 1975-Present

AWARDS AND HONORS
Distinguished Alumna Award, University of Kentucky, School of Library and Information Science, 1996
Who’s Who in American Education, 1996-Present
Who’s Who in the West, 1996-Present
Who’s Who in America, 1995-Present
Who’s Who of American Women, 1991-Present
Tribute to Women and Industry (TWIN) Award, Bellcore, 1989
Beta Phi Mu, International Library Science Honor Society, 1978
Kimberly Douglas

Professional Preparation

Long Island University
M.S., Library and Information Science.

Free Universitaet,
M.A., Germanistik.

Appointments

1995 - present, Director of the Sherman Fairchild Library of Engineering and Applied Science, Caltech Library System, Pasadena, CA

1988- 1995, Head of Reader Services, Caltech Library System, Pasadena, CA

1985- 1988, Head, Science and Engineering Library, University of Southern California, Los Angeles, CA

1982- 1985, Director, Hancock Library of Biology and Oceanography, University of Southern California, Los Angeles, CA

1978 - 1982, Librarian, Bigelow Laboratory for Ocean Sciences, Boothbay Harbor, ME

Publications


“TOC/DOC: “It has changed the way I do science.” Science and Technology Libraries v. 16 (3/4) 1977 with Dana L. Roth.

Professional Contributions

“Making Sense of Digital Object Identifiers - Preconference.”

“Digital Object Identifiers (DOIs): Impacts, Costs and Concerns,”

Professional Activities and Memberships
American Library Association (ALA)
Association of College and Research Libraries (ACRL)
Science and Technology Section (STS)
Library Information and Technology Association (LITA)
Electronic Publishing/Electronic Journals Interest Group, 1997-
http://www.lita.org/igs/epej198.htm

National Information Standards Organization.
Digital Object Identifier Syntax Committee 1998-2000

Project related Activities
In 1995, when I became head of the new Sherman Fairchild Library, my responsibilities expanded into many aspects of information collection management including digital collections. This ranged from licensing issues, copyright and digital library coordination. I managed the library’s web site for the Caltech campus online discourse on Copyright in Scholarly Communication.
RICHARD C. FLAGAN  
Irma and Ross McCollum  
Professor of Chemical Engineering  
California Institute of Technology 210-41  
Pasadena, CA  91125  
(626) 395-4383  
FAX: (626) 568-8743  
E-mail: flagan@caltech.edu

EDUCATION
1969  University of Michigan, B.S.E. (Mechanical Engineering)  
1971  Massachusetts Institute of Technology, S.M. (Mechanical Engineering)  
1973  Massachusetts Institute of Technology, Ph.D. (Mechanical Engineering)

PROFESSIONAL EXPERIENCE
California Institute of Technology
2000 – present  Irma and Ross McCollum Professor of Chemical Engineering  
1990 - 2000  Professor, Chemical Engineering  
1996  Executive Officer of Chemical Engineering  
1986 - 1990  Professor, Environmental Engineering Science and  
Mechanical Engineering  
1981 - 1985  Associate Professor, Environmental Engineering Science  
1975 - 1981  Assistant Professor, Environmental Engineering Science
Helsinki University of Technology
1987  Visiting Professor, Mechanical Engineering
Massachusetts Institute of Technology
1975  Lecturer  
1973 - 1975  Research Associate

SYNERGISTIC ACTIVITIES
1988 - 1991  Member, Executive Board, Gesellschaft für Aerosolforschung.  
1991 – 1998  Caltech Faculty Library Committee  
1992 - 1994  Treasurer, American Association for Aerosol Research  
1994  Technical Program Chair, Fourth International Aerosol Conference  
1994 – 1998  Chair, Caltech Faculty Library Committee  
1994 - 1998  Associate Editor, Aerosol Science and Technology.  
1995 - 1996  Vice President, American Association for Aerosol Research  
1996 -1997  President, American Association for Aerosol Research  
1997  Co-chair, Conference on Scholarly Communication

AWARDS AND HONORS
1987  American Chemical Society, Division of Environmental Chemistry Outstanding Paper Award.  
1990  Marion Smoluchowski Award for Aerosol Research presented by the Gesellschaft für Aerosolforschung.  
1992  Japan Society for the Promotion of Science Fellow.
1993  David Sinclair Award of the American Association for Aerosol Research.
1997  Thomas Baron Award in Fluid-Particle Systems presented by the American Institute of Chemical Engineers.

RELATED PUBLICATIONS


OTHER SIGNIFICANT PUBLICATIONS


32 Ph.D. students advised, 15 Postdoctoral scholars
Eric F. Van de Velde, Ph.D.

Professional Preparation

1982 - 1986 New York University, Courant Institute
Ph.D. and M.Sc. Mathematics

1977 - 1982 Katholieke Universiteit Leuven (Belgium)
Burgerlijk Ingenieur in de Computerwetenschappen
(USA Equiv.: B.Sc. Engineering and M.Sc. Computer Science)

Appointments

1996 - present, Director of Library Information Technology

1992 – 1996, Senior Research Associate in Applied Mathematics

1989 – 1992, Senior Research Fellow in Applied Mathematics

1989 – present, Lecturer in Applied Mathematics

1988 - 1989, von Kármán Instructor

1986 - 1988, Staff Scientist

Publications

- No publications closely related to the proposed project. Relevant experience derived from implementing many digital-library projects for the Caltech campus.

- Other significant publications:
  


**Synergistic Activities**

In 1996, when I assembled a new Library Information Technology team, the Caltech Library System had no public workstations or file servers, only WYSE terminals connected to the online catalog. Over the past three years, I developed the information-technology infrastructure for the Caltech Library System, directed its implementation, and directed the implementation of new services, such as our electronic document-delivery and interlibrary-loan service. Our state-of-the-art facility is visited frequently from across the world by those who are planning to build new libraries.

Current projects in progress include: Networked Digital Library of Theses and Dissertations, Networked Computer-Science Technical Reference Library, the Caltech Undergraduate Research Journal, and implementation of the SFX database-linking system.

I am the Caltech institutional representative for the Open Archives initiative and the Coalition for Networked Information.

**Collaborators and Other Affiliations**

i. Collaborators in past five years: none. (Except for collaborators on current proposal.)

ii. Graduate and Post Doctoral Advisors: Oliver McBryan (University of Colorado at Boulder), Herbert Keller (Caltech)

Wayne Waller

Wayne Waller is a Member of the Professional Staff at Caltech and Head of the Digital Media Center. The DMC provides the CIT community with state-of-the-art tools and services related to digital video production and delivery, digital imaging and multimedia presentation, and computer-based interactive courseware development.

For 20 years prior to coming to Caltech, Mr. Waller worked as a new media creator, consultant, and trainer with a broad array of clients—such as Johnson & Johnson, Pacific Telesis, U.S. Postal Service, and Harvard University and with industries ranging from healthcare to entertainment.

Initially trained as an architect at the University of California at Berkeley in the early 1960s, Mr. Waller received a second education in film production from UCLA. His graduate and post-graduate degree work concentrated on the individual’s experience of media and on applying knowledge of psychology, perception, and communication to the development of more active and participatory forms of media.

In the early 1970s Mr. Waller joined the faculty of the University of Southern California as an Assistant Professor of Behavioral Sciences where he became one of a small group of early experimenters with interactive multimedia computing and its potential role in the educational process. His work there to develop an interactive learning system for the training of young doctors was supported in part by a grant from Apple Computer and was recognized by the Academy of Applied Behavioral Sciences in his selection as a keynote speaker at its First National Conference.

In 1980 Mr. Waller left USC to help establish a new software company as Director of Design and Development. This new company, headed by psychoanalyst Dr. Roger Group (upon whose work the books *Passages* is based), became an early innovator in the design of interactive psycho educational software and helped pioneer the use of the computer as a tool in the direct delivery of mental health care work, for which it was later honored by the Smithsonian Institute for software innovation in Medicine (1990).
Leslie B. Sims

Summary Resume

May 2000

Education:
University of Illinois, MS June, 1961; Ph.D., February, 1967
Harvard University, Institute for Educational Management, Summer, 1986
University of Michigan, 1958-1959
Southern Illinois University, BA, June, 1958 (Honors)

Professional History:
University of Iowa, 1991-present
Dean, Graduate College and Professor of Chemistry, 1991-present
Associate Provost for Graduate Education, 1997-present
North Carolina State University, 1983-1991
Professor of Chemistry, 1983-1991
Associate Vice Chancellor for Research, 1989-1991
Indiana University, Visiting Professor of Chemistry, July-December, 1982
University of Arkansas, 1967-1983
Assistant Professor (Chemistry) 1967-70; Associate Professor 70-75; Professor 75-83; Chair, 79-83
University of Sheffield, England, Visiting Research Scientist, January-August, 1975 and Summer, 1977
Michigan State University, Assistant Professor, 1964-67

Awards and Honors:
Listed at various times in: Who's Who in the South and Southwest, Who's Who in Technology Today, Men of
Achievement, American Men and Women of Science, International Who's Who in Engineering
PostgraduateHonors:Scientific Research Council(Great Britain), Visiting Scientist Fellow, 1974 and
Summer, 1977; Faculty Affiliate, Mount Marty College, Yankton, SD, 1976-77 and 1982-83;
Omicron Delta Kappa, elected 1994 (nominated by University of Iowa students)
Graduate Honor Societies and Awards: Phi Lambda Upsilon, Sigma Xi, NSF Competitive Graduate Fellow,
University of Illinois, 1961-64
Undergraduate Honor Societies: Phi Eta Sigma, Phi Kappa Phi, Pi Mu Epsilon

Research:
Physical Chemistry: Dynamics of Chemical Reactions; Kinetic Isotope Effects;
Gas-Phase Kinetics; Unimolecular Reactions; Molecular Vibrations
Publications: Twenty-eight papers in refereed journals
Research Support: Over $1,500,000 NSF grants, 1967-83; $1.2M NSF, NC Biotechnology Center, US
Department of Education, 1983-89
Theses/Dissertations Directed: 14 Ph.D., 4MS, 8 Post-Doc, 2 Visiting Scientists

Teaching Activities:
Graduate Courses: Quantum Chemistry, Vibrational Analysis, Statistical Thermodynamics, Chemical
Thermodynamics, Chemical Kinetics, Theoretical Kinetics
Undergraduate Courses: General Chemistry, Physical Chemistry, Physical Chemistry Laboratory
Special Programs: Director, NSF-sponsored Summer research participation programs, 1970,1971,1972

Professional Organizations and Service:
Association of American Universities/Association of Graduate Schools Executive Committee, 1998-01
Committee on Institutional Cooperation, Chair, Graduate Dean’s Assembly, 1999-00
Midwestern Association of Graduate Schools, Member at Large, 1998-99, Chair Elect, 99-00, Chair, 00-01
NSF: Advisory Committee on Minority Programs, 1995-98
National Association of State Universities and Land-Grant Colleges (NASULGC), Board of Directors, 96-98;
Council on Research Policy and Graduate Education (CRPGE): Executive Cmte. 94-96; Chair, 94-95
Council of Graduate Schools (CGS): Member, Board of Directors, 1993-95; 1995-98
Graduate Record Examination (GRE): Users Services Committee, 1994-1996
American Chemical Society, member; local chapter officer, Michigan State Univ and Univ. of Arkansas
Society of Sigma Xi; 1967-present; University of Arkansas Chapter President, 1978-79
American Association for the Advancement of Science, Member
Reviewer of manuscripts for Journals of the American Chemical Society, Journal of Chemical Physics,
Reviewer of grant proposals for NSF, ACS/PRF, Research Corporation

lbs.resumesh
William C. Welburn

University Address:
Graduate College
University of Iowa
Iowa City, Iowa 52242
319-335-3493
william-welburn@uiowa.edu

Educational Background

B.S., Journalism, Syracuse University, 1975

Academic and Professional Work Experience

Assistant Dean of the Graduate College, The University of Iowa, 1993-Present.


Diversity/Special Services Librarian and Coordinator, Social Sciences Division, University of Iowa Libraries, Iowa City, Iowa, 1990-1993.

Instructor, Rutgers University, School of Communication, Information, and Library Studies, Department of Library and Information Studies, New Brunswick, New Jersey, 1989-1990.


Assistant Professor, School of Library and Information Science, Atlanta University, Atlanta, Georgia, 1987-1988.


Publications


Book Reviews

Danky, James and Weigand, Wayne. Print Culture in a Diverse America, C&RL: College and Research Libraries. 61(2), March 2000


Invited Lectures and Papers:


"Diversity" (Issues of Challenge and Change). Presentation given at the conference on The Role of the Student Assistant in the Academic Library. Iowa State University, Ames, February 1993.


Grants:


SUZIE ALLARD
slalla0@pop.uky.edu

EDUCATION:
University of Kentucky, M.S., 1999 (Library Science)
California State University, Northridge, B.A. 1982 (Economics)
Currently a University of Kentucky Presidential Fellow in the
Communication and Information Studies Doctoral program

PROFESSIONAL EXPERIENCE:
Consultant, 3/94-8/99
Provided research consulting services to a select group of clients, focusing on creative
development and marketing of entertainment product. See listing under Research Frontiers Corporation for
a more complete description of work.

Editor-in-Chief, Super Outdoors Magazine, 9/95 – 6/97
Worked with publisher to establish organizational structure of enterprise.
Created materials to train staff.
Devised, negotiated and oversaw implementation of marketing
Responsible for overseeing all editorial duties
Represented the magazine to professional organizations and corporate entities.

Vice President, Research Frontiers Corporation, 3/77-3/94
RFC was a highly regarded firm based in California which offered consulting regarding the
creative development and marketing of entertainment product and associated technologies. Clients
included Warner Bros. Television, Paramount Studios, Universal Television, Columbia Television, Hanna-
Barbara Productions, and the NBC and CBS networks.
Ratings: Analyzed ratings materials and prepared daily status memos, weekly review memos, and sales
memos based on overall performance, competitive relationships and demographics. Liaison with
Nielsen technical personnel.
Quantitative Research: Responsible for all aspects of national and international studies (intercept,
telephone, theater, cable etc.) including questionnaire preparation, sample coordination, field
operative management, data verification, data analysis and report writing.
Qualitative Research: Responsible for all aspects of research including focus group design, screener
design, acting as moderator, client hosting, and report writing.
Assessment Report for Fin-Syn: Researched and co-authored report analyzing decades of production and
television programming relative to studio financial investment in product. Report was used to
argue Fin-Syn on Capitol Hill.
Technology Research: Conducted research and/or provided recommendations on a wide variety of
technology related issues including: audience reception of videotape versus film, the
implementation and viability of video sets in airline seats, consumer acceptance and usage of
videotape machines (timeshifing habits etc), consumer interest in video rentals, leisure time
usage of technology related items, the design and implementation of an industry-wide database
reporting on production status and talent availability, and the introduction of computers into the
executive suite.

Chief Operating Officer, America’s Choice Theatre, 1/89 – 9/90
Held duties concurrently with work at RFC. ACT previewed new entertainment product to
consumers and measured their response with advanced technology information systems. Was a founding
team member.
Co-designer of research methodology.
Liaison with technology team for entertainment industry concerns.
Assessed existing system and helped develop new software and input devices to meet client
needs, helped troubleshoot technology implementation design in theater setting.
Developed theater operations systems
Oversaw daily operations to assure proper testing environment.
ACADEMIC ENVIRONMENT CREDENTIALS:
Teaching Assistant, 8/99-5/00 - 2 courses each semester
  Full Instructor for JOU204, Writing for Mass Media
  Lab Instructor for ISC261, Writing for Integrated Strategic Communication
  Both courses were held in a computer lab and all students were online throughout the class.

SERVICE (Selected):
  Member, University of Kentucky Graduate School’s Ad Hoc Committee on Electronic Theses and Dissertations, 1999-
  Member, University of Kentucky School of Library and Information Science Planning Committee, 1999-
  Member, Board of Directors, American Communication Association, 1999-
  Member, Training Committee, Networked Digital Library of Theses and Dissertations, 2000-
  Grant Reviewer, National Science Foundation, 2000-

AWARDS:
  Presidential Fellowship, University of Kentucky for Academic Year 2000-2001
  Beta Phi Mu: International honor society for library and information science
  Commonwealth Research Award 10/99
  University Graduate Student Development Award for Academic Year 1999-2000

PRESENTATIONS:
“Removing Barriers for Scholarly Communication between Disciplines,” Research presentation at the College of Communications and Information Studies Graduate Student Symposium, University of Kentucky. 4 March 2000.
“Optimizing Knowledge: Technology as a Tool to Remove the Barriers between Disciplines,” Seminar presented at the Center for Computational Sciences, University of Kentucky. 8 Feb 2000.

PUBLICATIONS: (Aside from those published in proceedings above)
LOIS MAI CHAN  
Loischan@pop.uky.edu

Lois Mai Chan is a professor at the School of Library and Information Science, University of Kentucky. An internationally-recognized expert in subject access to information and in machine-readable cataloguing records, she has spoken and written extensively on cataloguing, controlled vocabulary, and knowledge organization; and her publications include nine books and more than sixty articles. Dr. Chan currently serves as a project consultant for OCLC’s Cooperative Online Resources Catalog (CORC) Project and has also served as a consultant to the Library of Congress Cataloging Policy and Support Office. Dr. Chan’s expertise for this project is also reflected by her service on the Subcommittee on Metadata and Subject Analysis for the Association of Library Collections and Technical Services and on the International Federation of Library Associations and Institutions’ Standing Committee on Classification and Indexing.

EDUCATION:
University of Kentucky, Ph.D., 1970 (Comparative Literature)  
Florida State University, M.S., 1960 (Library Science)  
Florida State University, M.A., 1958 (English)  
National Taiwan University, A.B., 1956 (Foreign Languages)

PROFESSIONAL EXPERIENCE:
Professor, School of Library and Information Science, University of Kentucky, 1980-  
Associate Professor, College of Library Science, University of Kentucky, 1974-1980  
Assistant Professor, College of Library Science, University of Kentucky, 1970-1974  
Serials Cataloger, University of Kentucky Libraries, 1966-1967  
Assistant Librarian, Lake Forest College Library, 1964-1966  
Serials Acquisition Librarian, Northwestern University Libraries, 1963-1964  
Assistant Cataloger, Purdue University Libraries, 1961-1963  
Assistant Order Librarian, Purdue University Libraries, 1960-1961

PROFESSIONAL SERVICE:
CURRENT (Selected):
Project Consultant, OCLC Online Computer Library Center (CORC (Cooperative Online Resources Catalog) Project), 1999-  
Consultant, Cataloging Policy and Support Office, the Library of Congress, 1995-  
Subcommittee on Metadata and Subject Analysis, Committee on Subject Analysis, Association of Library Collections and Technical Services, 1998-  
Standing Committee on Classification and Indexing, International Federation of Library Associations and Institutions, 1997-

RECENT (Selected):
Subject Analysis Committee, Cataloging and Classification Section, Association of Library Collections and Technical Services, member, 1995-1998  
Decimal Classification Editorial Policy Committee, 1975-1993 (Vice-Chair, 1980-1984; Chair, 1986-1991)

RESEARCH GRANTS (Selected):
ORAL PRESENTATIONS:

International (Selected):

"Keywords vs. Controlled Vocabulary," Workshop on Classification and Indexing, 30 August 1999, National Science Library, Ho Chi Minh City, Vietnam.


"Subject Data in the Metadata Record," 11th New Information Technology Conference, 19 August 1999, Taipei, Taiwan.

USA (Selected):

"Knowledge Class," ASIS SIG/CR Classification Research Workshop, held at the Annual Meeting of the American Society for Information Science, November 2, 1997 (Washington, DC)


"A Computer-Generated Subject Validation File," Library and Information Technology Association Authority Control Interest Group Meeting, January 21, 1996 (San Antonio, Texas)

PUBLICATIONS: BOOKS (9, including):


PUBLICATIONS: ARTICLES (over 60, including):


GRADUATE STUDENTS (over 1000 masters' degree students, including):

Deanna Marcum (President, Council on Library Resources)
Anne M. Buck (Director of Libraries, California Institute of Technology)
Charles Hurt (Associate Dean, Social Science, University of Arizona)
Terry L. Beavers  
Technology Assessment Coordinator  
Information Technologies  
University of South Florida

SVC 4010  
Tampa FL 33620  
813.974.5287 (voice mail)  
813.974.3054 (fax)  
tbeavers@admin.usf.edu (email)  
Website: http://usfweb.usf.edu/taa/taa.htm

Current Position

• Technology Assessment Coordinator, Information Technologies, USF. Sept, 1994 to date  
• Duties include evaluation & assessment of new software/hardware technologies, development of prototype applications demonstrating new technologies, introducing new technologies into the workplace, and participation in strategic and tactical planning for enterprise-wide information technologies.

Education:

• BA, Louisiana Tech University, Psychology, 1972  
• MS, University of Southwestern Louisiana, Psychology, 1975  
• Research Associate, Delta Regional Primate Research Center, Tulane University, 1977-1979  
• PhD, University of Southern Mississippi, Psychology, 1987

Previous Employment:

• Associate Director, Academic Computing & User Services, University of South Florida (University Computing Services), 1987-1994  
• Manager, User Services, Southeastern Louisiana University (Computing Services), 1983-1987  
• Consultant, User Services, Southern Methodist University (Computing Center), 1981-1983  
• Research Associate, Delta Regional Primate Research Center, Tulane University (Neurobiology), 1977-1979

Presentations:

• VBScript and ASP Programming course every semester  
• Web-based Database Access course every semester  
• “Introduction to XML”, Third International Symposium on Electronic Theses and Dissertations, 2000, USF, St. Petersburg FL  
• “Using NetMeeting for Online Collaboration”, Third International Symposium on Electronic Theses and Dissertations, 2000, USF, St. Petersburg FL  
• “Live audio/video Transmission of WBUL”, Internet2 Day, 1999, Tampa FL
Current Projects:

- Electronic Theses & Dissertations
  Develop an online collaborative environment to support ETDs
- Internet-2 High Definition Television
  Exchange high-resolution videos among PBS stations via I2
- Intranet Portal Development
  Create personalized web menu & authorization system
- E-Commerce Strategic Plan
  Create process for online credit transactions
- Web-Based Events Calendar System
  Create totally web-based calendar system for all campus groups
- E-Forms Implementation Committee
  Create process for moving business forms onto web
- Access America Digital Signature Advisory Board
  Develop national infrastructure for online student financial transactions

Selected Previous Projects:

- University-wide E-Mail Implementation (Exchange)
- WWW Implementation (http://www.usf.edu)
- Florida Online Plant Atlas
- USF Online Travel System (Stars)
- USF Web-based Student Information System (SunLink)
- Live audio/video transmission of WBUL radio via internet
- Current University Calendar System
- USF Online Directory
- USF Online Payroll Certification System (Certs)
- USF Digital Signature Certificate Authority service
ANITA L. CALLAHAN, Ph.D., P.E.

Industrial and Management Systems Engineering
University of South Florida
Tampa, FL 33620

Education:
M.S. Industrial Engineering, Stanford University, Stanford, California, 1985.

Professional Registration:
Licensed Professional Engineer, South Carolina

Experience:
August 1995 to Present - Associate Professor
Industrial and Management Systems Engineering, University of South Florida, Tampa, FL

August 1989 to August 1995 - Assistant Professor
Industrial and Management Systems Engineering, University of South Florida, Tampa, FL

September 1984 to August 1989 - Teaching Fellow/Academic Advisor
Industrial Engineering/Engineering Management, Stanford University, Stanford, CA

September 1985 to September 1989 - President and Consultant
Solutions for Management, Stanford, CA

May 1982 to September 1984 - Senior Industrial Engineer
Texize, Division of Morton Thiokol, Greenville, SC

May 1979 to May 1982 - Material Handling Consultant/Work Measurement Supervisor
Rapistan, Division of LSI, Grand Rapids, MI

August 1977 to May 1979 - Industrial Engineer
Sparta Foundry Company, Division of Muskegon Piston Ring, Spart, MI

Selected Publication and Presentations:


**Graduate Student Advisees:**

I have directed 4 Master’s degrees and 4 Ph.D. degrees. I am currently directing 1 Master’s degree and 4 Ph.D. degrees. I have served or am serving on 11 Ph.D. Committees. Former students from the last five years follow. Current affiliation is given in parentheses.

Dissertation Chair/CoChair:

- **Greg Deal** Engineering Science (Illinois State); 1995
- **Joanne Larsen** Engineering Science (University of Tampa); 1997
- **Lois Jordan** Engineering Science (University of Tampa); 1997
- **Denise Thompson** Industrial Engineering (Virginia State); 1998
- **Michael Washington** Industrial Engineering (Center for Disease Control); 1998 (expected)

Thesis Chair/CoChair:

- **William Bentley** Industrial Engineering (Procter & Gamble); 1992
- **Ketan Parekh** Industrial Engineering (Unknown); 1993
- **Venkatesh Kalipi** Industrial Engineering (Unknown); 1995
**Biographical Sketch**

Bruce J. Cochrane  
Professor of Biology and  
Director, Interdisciplinary Studies Program  
University of South Florida FAO 270  
Tampa, FL 33620  
Telephone: (813) 974-4059  
Email: coch@chuma1.cas.usf.edu

**Education:**

B. A., Biology, Cornell Univ., 1973  
M. A., Zoology, Indiana Univ., 1975  
Ph. D., Genetics, Indiana Univ., 1979  
Postdoctoral Fellow, Univ. of N. Carolina, 1979-1981.

**Positions Held:**

Director, Interdisciplinary Studies Program, University of South Florida, 1999-2003  
Professor, Dept. of Biology, Univ. of South Florida, 1999-present  
Associate Professor, Dept. of Biology, Univ. of South Florida, 1987-1999  
Visiting Scientist, Cornell University Agricultural Experiment Station, 1996-7  
Graduate Director, Dept. of Biology, University of South Florida, 1992-1996.  
Assistant Professor, Dept. of Biology, Univ. of South Florida, 1981-1987

Publications relevant to this proposal:


Other Recent Publications


**Participation in the USF Electronic Thesis and Dissertation initiative.** In collaboration with faculty from English, Business, and Engineering, we are working on a funded project to develop online tools that can enhance graduate, and by extension undergraduate writing and scholarship.
Rosann Webb Collins

Assistant Professor of MIS
University of South Florida
Tampa, Florida 33620

Education

Ph.D., 1993  University of Minnesota, Management Information Systems
M.L.S., 1978  University of North Carolina at Greensboro, Library Science
B.F.A., 1971 University of North Carolina at Greensboro, Fine Arts

Selected Publications and Presentations


**Related Research Grants**


Co-Principal Investigator, “The Evolutionary Nature of Data Warehouse Development.” $3,000, The Data Warehousing Institute matched with $3,000 from the I-4 Corridor Development Grant, 1998.

**Recent Collaborators and Co-authors**

France Bélanger (Virginia Tech)
Donald Berndt (University of South Florida)
Gina Green (Baylor University)
Laurie J. Kirsch (University of Pittsburgh)
Craig Van Slyke (Ohio University)

**Graduate Student Advisees**

I have co-directed 2 Ph.D. dissertations, one in progress and one completed. Current affiliations shown in parentheses.
Mary B. Burns, Ph.D. anticipated July 1998 (Texas Tech)
France Bélanger, Ph.D. 1997 (Virginia Tech)

**Graduate Advisors**

Gordon Davis and Shawn Curley (University of Minnesota)
Ilene Frank  
University Librarian, Reference Department  
Tampa Campus Library, LIB 122 (location LIB110)  
University of South Florida  
Tampa FL 33620-5400  
813.974.2483 (voice mail)  
ifrank@lib.usf.edu  
Webpage: http://www.lib.usf.edu/~ifrank/  

Current Position  
University Librarian (i.e. “full” librarian), Tampa Campus Library, Reference Department. 1974 to date  
Duties include reference and collection development for the College of Fine Arts (Art, Dance, Theatre), School of Architecture.  
Committee assignments and interests: Distance learning tools and techniques, use of technology in the classroom, library services to distant users.

Education:  
BSD, University of Michigan, School of Architecture and Design, major painting, 1967  
MLS, University of Michigan, School of Library and Information Science, 1974  
MFA, University of South Florida, School of Fine Arts, major painting, 1986

Committee Assignments  
Tampa Campus Library Instruction Team: Jim Vastine, coordinator (Reference Department)  
USF Libraries’ Virtual Library Project  
Electronic Theses and Dissertations Implementation Team  
The Interface Design Project Group  
Outcomes Assessment Team  
USF Academic Computing Committee: A university-wide faculty advisory committee  
VITAL: A university-level committee encouraging faculty to use technology in the classroom.  
SUS Distance Learners Library Support Subcommittee  
SUS/CC Distance Education Library Support Implementation Committee  
SUS Public Services Planning Committee. WebLUIS Task Force

Previous Assignments:  
Coordinator for Collection Development, Tampa Campus Library, 1992  
Associate Head for Services, Tampa Campus Library, 1993

Teaching and Library Development  
Teaches at both the graduate and undergraduate level for the School of Library and Information Sciences, University of South Florida, 1994 to date.  
[Developed an online distance learning version, Spring Semester 1996 to date]
[Developed a course in "Library Services for Distant Users" taught Spring and Summer semesters, 1999]
[USF Learning Communities: Information Literacy component for LC11 Assigned for two years: Fall 1999 to Spring 2001]
Other teaching assignments have included Honors courses in beginning web design
Electronic Reference Service Implementation Team
Established, along with a colleague, an email reference service for the Tampa Campus Library, 1995.
Associate Coordinator for Virtual Libraries, Global Network Academy
Consultant on web design
Consultant for library webpages redesign for St Petersburg Junior College, January 2000.

Presentations and Papers

Frank, Ilene, Rhonda Smith, Stephanie Race. Web-based presentation and online session.
"Ensuring Successful Web-Based Research Experiences" [Presented jointly with Andrew Smith] Sponsored by the Center for Teaching Enhancement, University of South Florida Presented at the Eighth National Conference on College Teaching and Learning, Jacksonville, FL, April, 1997
"Implementing an electronic reference service" Paper read at ARLIS/NA Annual Convention, Dallas, TX, April, 1997
"University Level Course: "Internet Resources" in the Classroom and at a Distance." Presented to the Florida Chapter of ACRL, Orlando, FL, October 1996
"Comparison of WWW Search Engines" Presented to the Association of Architecture School Librarians annual meeting, Boston, MA, March 1996
**Summary**

Moxley's current research and scholarship examines the effects of information technologies on academic scholarship. He is working with his academic colleagues and education leaders to research ways to facilitate electronic theses and dissertations. Moxley has published nine books: four books on scholarly publishing and the academic reward system; one edited book on ethnography; one edited book on teaching creative writing; two books on legal writing; and one college-level rhetoric. His essays have appeared in numerous publications, including *College Composition and Communication, Innovative Higher Education, and College Teaching*. Moxley has authored successful grant proposals, including a three-year grant from the Department of Education to develop learning communities at USF. He teaches graduate courses in pedagogy, research methods, computers and composition, and composition theory. At the undergraduate level, he teaches technical and academic writing. He is the recipient of three undergraduate awards for excellence in teaching. Moxley serves as a writing coach for professional organizations and university faculty, offering workshops on academic writing, grant writing, writing across the curriculum, learning communities, and tools for writers. His academic clients include the Universite d'Artois (in Bethune, France); the Ana G. Mendez University System in Puerto Rico; the Bowman Gray College of Medicine at Wake Forest University; the University of Memphis; the University of Puerto Rico College of Medicine; Professional Organizational Development Network; and Stetson University College of Law. His business clients include the American Bar Association, the Utah Bar Association, KPMG Peat Marwick, and Bausch and Lomb Pharmaceuticals.

**Education**

Ph.D., SUNY at Buffalo, Educational Research and Evaluation, 1984  
M.A., SUNY at Buffalo, Creative Writing, 1980  
B.A., University of Utah, Creative Writing, 1978  
B.A., University of Utah, Psychology, 1978

**Related Administrative Experience**

Project Director, USF and Microsoft ETD Pilot Research Project (5/99--present), [http://etd.eng.usf.edu](http://etd.eng.usf.edu)  
Director, Center for NewMediaWriting.Org  
Conference Director, Third International Symposium on ETDs: Applying New Media to Scholarship (3/2000)  
Chair, USF Task Force on ETDS, USF (1/97-present)  
Project Director, USF Flexible Learning Community Model (8/96-8/99) ([http://www.usf.edu/~lc](http://www.usf.edu/~lc))--a FIPSE-sponsored project under Rosemary Wolfe

**Related Publications**

**Books in Process**

Fox, Ed, Weisser, Christian, and Moxley, Joseph M. *Electronic Theses and Dissertations Sourcebook*.  
Moxley, Joseph M. *A Field Guide to Research*. (Under contract with Allyn & Bacon)  
Moxley, Joseph M. *Becoming an Academic Writer: A Modern Rhetoric* (Working on a revision)

**Articles Submitted for Publication**
Moxley, Joseph M. "New Media Scholarship: A Call for Research."
Moxley, Joseph M. "Academic Scholarship in the Digital Age."
Moxley, Joseph M. Digital Dances: New Media Theses and Dissertations (an ethnography)

**Related Books Published**

**Edited Books:**

**Authored Books:**
- Moxley, Joseph M. *Writing and Publishing for Academic Authors*. Lanham, MD: University Press of America, 1992. (Also published as a UPA paperback.)

**Articles Published**
- Moxley, Joseph M. "Academic Scholarship in the Digital Age". *On the Horizon*

**Articles Reprinted**

**Related Papers Delivered at Professional Conferences**
Michael R Salmond

Bio:

Education:

Currently undertaking MFA in Studio/Digital Media, University of South Florida, FL. USA

Graduate of MediaLab Arts B.Sc. (honours) University of Plymouth, Plymouth, Devon, UK.

MediaLab is a multidisciplinary course in computer based interactive multimedia, combining skills in both the creative arts and computer science.

Positions Held:

1996-1997: 1999-Present:

Information Technologies University of South Florida. FL. USA

Title: Multimedia & Internet Applications Specialist

Internet and Multimedia Designer. Designing and implementing Internet Websites and new media products for the Information Technologies department and the University. Internet design and implementation, utilizing skills in streaming audio and video, HTML and VRML ; Dynamic HTML and Flash technologies. Competent use of ASP & JavaScript.

Implementation of interactive leading edge website and CD-ROM design using Director Shockwave, and graphic design. Production of inter-departmental and university wide presentations for use in training seminars and for general student information. Evaluation of new multimedia computer hardware and software. Advanced level knowledge in a wide variety of multimedia production tools including digital video, object oriented programming, 2D graphics, 3D modeling and animation.

http://gummo.admin.usf.edu | http://usfweb.usf.edu/taa |

1998:

Red Rock Media; Brainworks Plc. Fareham, Hampshire, UK. http://www.brainworks.co.uk

Title: Senior Web Designer:

Production of on-line ordering system, client and customer database integration and overall website function and design. Upkeep of all systems in regard to on-line purchasing and inventory as well as customer technical support.

1989-1994:


Title: IT Technical Support.

On-site technical support of company hardware and software. Evaluation of corporate software for implementation throughout a multi-national company. Duties included on-site employee training, company wide hardware and software upgrades, Novell Token Ring network support and liaison with third party hardware contractors.
Freelance:

*Design for Discreet Users (pub. MDI-UK)*  [http://www.design4.net](http://www.design4.net)

Feature article Journalist:

Published (monthly and bi-monthly in the UK and the US) variety of industry-based articles on discreet Inc. products, 3D community and industry news as well as in-depth company profiles. Also produced features such as product evaluation and in-depth product tutorials.

Design Committees:

Third International Symposium on Electronic Theses and Dissertations:

Production and design of multimedia (flash and HTML hybrid) website integrating conference details with interactive media, video and audio. [http://etd.eng.usf.edu/conference/](http://etd.eng.usf.edu/conference/)

**Caiia - Star- (Science, technologies & Art Research) University of Plymouth**

Member of the production team that created and designed an interactive multimedia installation/presentation previewed at the Millia, International Content Market for Interactive Media, Cannes, France. [http://caiia-star.soc.plym.ac.uk/](http://caiia-star.soc.plym.ac.uk/)

New Designers Exhibition, "evolve": Islington, London UK

Member of naming and driving committee for student event. Featured 4 project works in show. [http://caiia-star.soc.plym.ac.uk/mla/course/index.html](http://caiia-star.soc.plym.ac.uk/mla/course/index.html)
Appendix C. Support Letters

Adobe
CGS
CIC
CNI
ISTEC
National Library of Canada
OCLC
SOLINET
UNESCO
May 15, 2000

Professor Edward A. Fox
Department of Computer Science, M/C 0106
660 McBryde Hall
Virginia Tech
Blacksburg, Virginia 24061

Dear Professor Fox:

I am pleased to write on behalf of Adobe Systems, Incorporated in support of Virginia Tech’s FIPSE proposal for the Graduate Student Development Initiative. As you know Adobe has been interested for a number of years in the electronic transmission and storage of documents, in particular the usage of Adobe’s Portable Document Format (PDF) as part of the theses and dissertation process.

Adobe is pleased to serve on the NDLTD Steering Committee and will continue to support this effort. In addition, Adobe will donate an Adobe Acrobat ten seat starter kit (in shrink wrap or license form) to each new NDLTD university (US based only). The estimated street price of a ten seat license as of May/2000 via Adobe’s Educational License Program is $470.00/per ten seats ($47.00/per seat). Lastly, Adobe’s Academic Business Development Managers will continue to support NDLTD universities at a regional level.

The Graduate Student Development Initiative is particularly promising because it involves a partnership between Virginia Tech and four other graduate institutions. These partnerships can be highly successful by leveraging the particular expertise of each institution toward the goals of the project. Moreover, this project will enhance the experience of all five institutions with ETD’s so that they can serve as models for other institutions interested in starting an ETD program.

The project will undoubtedly move the technology and practice in the direction of better use of theses, dissertations, and other research documents. It is for this reason that we at Adobe strongly encourage FIPSE to support this proposal. We will closely follow the project as it develops, and you may count on our full cooperation in this important effort.

Best Regards,

Monica Prahinski, Adobe Academic Business Development Manager

Cc: Peggy Snyder, Adobe Director of Education
April 3, 2000

Dr. John L. Eaton  
Associate Provost for Graduate Studies  
Virginia Polytechnic Institute and State University  
202 Sandy Hall  
Blacksburg, VA 24061

Dear John:

I am pleased to write, on behalf of the Council of Graduate Schools, in support of Virginia Tech's FIPSE proposal for the Graduate Student Development Initiative. As you know, the Council of Graduate Schools has been interested for a number of years in the electronic transmission and storage of documents, particularly of theses and dissertations. It is our belief that these documents constitute a rich resource of research literature that to date has been underutilized.

CGS is pleased to have been involved with the Electronic Thesis and Dissertation project since its inception in 1992. We expect that by using computer technology, theses and dissertations will undergo a transformation similar to that now underway in electronic journals. The proposed project, in concert with the Open Archives Initiative, will benefit graduate schools of all sizes by making information more accessible to all.

The Graduate Student Development Initiative is particularly promising because it involves a partnership between Virginia Tech and five other graduate institutions. These partnerships can be highly successful by leveraging the particular expertise of each institution toward the goals of the project. Moreover, this project will enhance the experience of all six institutions with ETDs so that they can serve as models for other institutions interested in starting an ETD program.

CGS members, which number 440 U.S. graduate institutions, will want to be kept informed as your project progresses. Along those lines, CGS will inform its membership by publishing information about this project in its Communicator newsletter and conducting sessions at future CGS Annual Meetings on the electronic dissertation project.
Dr. John L. Eaton
April 3, 2000
Page two

Again, CGS believes that your project will move the technology and practice in the direction of better use of theses, dissertations, and other research documents. The Council of Graduate Schools strongly encourages FIPSE to support this proposal. We will be interested in keeping in touch with the project as it develops and in working with you in this important effort.

Sincerely,

Peter D. Syverson
Vice President for Research and Information Services

cc: Jules B. LaPidus, President
May 15, 2000

Professor Edward A. Fox
Department of Computer Science, M/C 0106
660 McBryde Hall
Virginia Tech
Blacksburg, VA 24061

Dear Ed,

On behalf of the Committee on Institutional Cooperation (CIC), the academic consortium of the Big Ten Universities and the University of Chicago, I am pleased to write a letter supporting the proposed Graduate Student Development Initiative (GSDI). This project, led by Virginia Tech, the University of Iowa, Cal Tech, the University of Kentucky, and the University of South Florida, will build upon and extend the previously supported FIPSE project on “Improving Graduate Education with a National Digital Library of Theses and Dissertations.” Through your leadership and FIPSE support, we are on the verge of a transformational change in graduate education and the dissemination of the output of graduate research in the form of electronic theses and dissertations.

As you know, the CIC universities are keenly interested in an organized transition to electronic theses and dissertations. To that end, we have supported the Networked Digital Library of Theses and Dissertations (NDLTD) for several years, conducted planning and development activities at individual CIC institutions, and worked toward CIC-wide exploration and adoption of best practices. The proposed GSDI will provide critical work at the national level toward helping graduate students to become effective communicators in the coming age of rich, complex electronic communication, and toward increasing access to student research results.

As a member of the NDLTD Steering Committee, I have been very impressed by the fine, thoughtful work of this group. The NDLTD SC has broad representation, tapping expertise from a variety of areas that are necessary to make ETDs a widely accepted form of scholarly communication. The NDLTD SC is sensitive to the fundamental issues that need to be addressed without becoming paralyzed by them. First and foremost, the NDLTD project is focused on graduate student learning and communication. When theses and dissertations become much more accessible and widely used and cited, the work of graduate students will truly become a fruitful body of research literature.
In order for ETDs to become widely adopted, we need to continue our efforts at individual institutions and regional consortia (such as the CIC), as well as at national and international levels. The GSDI is a crucial component of efforts at the national level. The CIC tries to mediate between national and international efforts and the work being done at individual CIC universities. To that end, the CIC is planning to hold an ETD Workshop in August 2000, bringing together graduate school staff, librarians, computing staff, educators, and graduate students.

In summary, the CIC believes that the GSDI project will significantly improve graduate education, the communication skills of graduate students, and the dissemination and broad acceptance of ETDs. The CIC strongly encourages FIPSE to support this proposal. Through its continuing presence on the NDLTD Steering Committee, the CIC looks forward to working with the project team to improve graduate student use of electronic publishing and digital libraries—as researchers, authors, and future scholars.

Sincerely,

[Signature]

Thomas A. Peters
Director, Center for Library Initiatives
Committee on Institutional Cooperation
May 16, 2000

Professor Edward A. Fox
Department of Computer Science
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

Dear Ed:

I am pleased to write this letter of support for Virginia Tech’s FIPSE proposal for the Graduate Student Development Initiative. The Coalition for Networked Information (CNI) has had a strong interest in electronic theses and dissertations since the early 1990’s and we have benefited from your work and insights related to this issue since that time.

Your proposal addresses many key issues in scholarly communication and uses the vehicle of the thesis or dissertation as the mechanism for preparing students to become authors of electronic texts. In addition, this proposal is significant in making universities cope with preservation strategies for their electronic records and documents as another strategic contribution. As you stated in your proposal, “most campuses have no digital library of works produced by their own scholars, and do not know how to develop one.” This issue is becoming more serious for the access to and dissemination of scholarly information. Projects such as yours that address the need of institutions to develop mechanisms to train students in scholarly communication for the networked environment are sorely needed. Whether graduates take positions in higher education or in industry, they need to be informed creators and consumers of networked information. Your project addresses issues such as standards, metadata, and intellectual property, all key concepts for students to understand as they become authors in the networked environment.

CNI is an organization dedicated to realizing the transformative promise of advanced information technology and networked information to enhance scholarship and intellectual productivity. Founded in 1990, it is a joint program of the Association for Research Libraries and EDUCAUSE, and is supported by some 200 dues-paying member institutions representing higher education, government, publishing, scholarly and professional societies, libraries, networking and telecommunications, and information technology. We support the Networked Digital Library of Theses and Dissertations.
(NDLTD) by serving on its Steering Committee and we anticipate continuing that commitment. CNI has also served as the host for most of the NDLTD Steering Committee meetings over the past few years.

The semi-annual CNI Task Force meetings have served as a regular dissemination forum for progress on the NDLTD's activities. We have scheduled project briefings on this topic at almost every meeting in the years since the project's creation. We look forward to highlighting the results of the Graduate Student Development Initiative in our future Task Force meetings. They provide an excellent venue for many universities, publishers, and libraries to learn of developments in this field.

CNI strongly encourages FIPSE to support this proposal. You and your Virginia Tech colleagues have an excellent record of producing widely used practices in this area and you have a genuine, deeply felt commitment to preparing graduate students to become authors and communicators in the digital environment. The NDLTD has had a significant impact on how universities are approaching the preparation of electronic theses and dissertations in the US and around the world. FIPSE's continued support of your work will be of benefit to this wide community of higher education institutions.

Sincerely,

Clifford Lynch
Executive Director
Albuquerque NM, May 12, 2000

Professor Edward A. Fox  
Department of Computer Science, M/C 0106  
660 McBryde Hall  
Virginia Tech  
Blacksburg, VA 24061

Dear Professor Fox:

On behalf of the Ibero-American Science and Technology Education Consortium (ISTEC) accept our special greetings. We are pleased to write this letter in order to strongly support the Virginia Tech proposal to the Fund for the Improvement of Postsecondary Education. We are convinced that this Graduate Student Development Initiative will benefit not only the academic and scientific community in the United States but also the Ibero-American community of researchers and professors.

This Proposal is of crucial importance because it will allow us to strengthen the association we have developed with Virginia Tech and the Networked Digital Library of Theses and Dissertations (NDLTD). The purpose of this alliance is to create awareness on the importance of having access to real time information on the most recent research projects produced in today's academic world, and awareness about the availability of new revolutionary technologies that can link academic efforts to otherwise isolated academic areas.

Taking into account that information technologies will induce driving forces to generate social and economic growth, ISTEC through its Initiatives aims to work in a collaborative effort with academia, industries, international agencies and governments, promoting scientific and technological education, joint international efforts in research and development, economic integration, and human capital development within the region.

As you know the ISTEC Library Linkages Initiative is a long-term project that seeks to modernize document delivery as a component of education and research and development (R&D). This initiative also seeks to broaden electronic availability of research materials, to upgrade the information system skills of library staff, and to sharpen the savvy and independence of the electronic library user. ISTEC's LibLink Initiative also seeks to solve the information shortage and lack of dissemination of academic work, especially by new masters and doctorate programs graduates, the ones who produce the most recent research.

To date, projects within the Library Linkages Initiative have trained in excess of 5,000 people, transferred over 150,000 pages of documents, created regional inter-library loan systems, established an on-line journal for Information Technology, established databases for local library collections, and developed software for document transmission as well as a search engine for retrieval of on-line journal information. In 1999, the ISTEC-LibLink network supplied over 10,000 documents electronically to its members. This is the largest collaborative effort in Digital Libraries via Internet in the entire region, providing for 86% of all documents delivered to the universities. Based on this experience, the model is being utilized in Argentina, Colombia, Mexico, and Spain. Working with Virginia Tech and NDLTD collaboration is performed in a multiple, all inclusive and interactive axis, and researchers from all languages and all academic centers of the region can benefit from access to current scientific information in real time.
ISTEC shares the idea that it is important to join efforts, maximize all our resources, exchange information, identify common problems and solutions, mitigate deficiencies of information and achieve our primary goal, to be efficient agents delivering services and products resulting in greater sustainable development. ISTEC envisions a joint working plan with Virginia Tech chartered by a feasible program that will enable us to open new opportunities in areas of common understanding.

Taking all this into consideration, ISTEC supports Virginia Tech FIPSE proposal and wishes to broaden our collaboration horizon with NDLTD. Follow along these lines of collaboration and cooperation we aim at achieving an adequate level of development in science and technology education in the Ibero-American region.

Sincerely,

[Signature]

Ramiro Jordan
ISTEC Executive Director
15 May 2000

Professor Edward A. Fox
Department of Computer Science
660 McBryde Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

Dear Ed,

I am pleased to write on behalf of the National Library of Canada in support of Virginia Tech's FIPSI proposal for the Graduate Student Development Institute.

NLC has been an active member of the Networked Digital Library of Theses and Dissertations Steering Committee since the committee's inception and we look forward to continuing involvement. The NDLTD project's goals mesh well with those of the National Library's Canadian Theses Service program which processes 10,000 theses and dissertations or 90+% of the Canadian output each year. We believe the NDLTD project has accomplished much in a relatively short period of time and you and your colleagues are to be congratulated for the leadership that made this possible.

The Graduate Student Development Institute project identifies key issues that need to be addressed as the scholarly community moves into the electronic era. The objectives are ambitious but doable given the partners that have been engaged. We believe you and your colleagues are best positioned to initiate action on these issues, building on the success you have achieved to date.

Rest assured NLC will continue to complement your endeavors on electronic theses with ongoing support within Canada. Since coming back from the Florida symposium, I have already met with the executive directors of the Canadian Association of Research Libraries and the Canadian Association for Graduate Studies and am scheduled to speak on e-theses developments to the full membership of CARL next month. I have also been in contact with OCLC about collaboration on their initiatives in this area.

Please do not hesitate to contact me if I can be of any further assistance in providing support for the FIPSI proposal.

Sincerely,

David Balatti
Director, Bibliographic Services
May 15, 2000

Professor Edward A. Fox
Department of Computer Science
Virginia Polytechnic Institute and State University
660 McBryde Hall, M/C 0106
Blacksburg, VA 24601

Dear Ed,

I am happy to write on behalf of OCLC Online Computer Library Center, Inc., in support of Virginia Tech’s FIPSE proposal for the Graduate Student Development Initiative. OCLC as a cooperative of 36,000 libraries is vitally interested in the goals of this project. We are pleased to note that Lois Chan, who has worked with OCLC as an expert consultant in the cataloging area, and you, who have served on our Research Advisory Council, will be involved in this initiative.

OCLC has been involved in the Networked Digital Library of Theses and Dissertations from the earliest meetings. This project resonants well with our member libraries because it touches so many important chords: training scholars for the digital age, preparing universities for dealing with digital content, and potentially positioning universities to manage their intellectual content more effectively.

Virginia Tech has provided outstanding vision and leadership in this emerging trend. OCLC strongly encourages funding for this project. Demonstrations of best practices are the most effective way to encourage effective implementation of ETDs in all graduate programs.

As evidence of our interest, I make the following commitments by way of in-kind support:

- OCLC will continue to serve on the Steering Committee of NDLTD.
- We will make available, free of charge, special software developed by the Office of Research for member use, at time of beta release, when such will be of assistance to this initiative.
- We will provide technical assistance regarding the use of the Dublin Core and related standards efforts that have been managed by OCLC staff.
- OCLC will be willing to host technical meetings, related to standards, training, or similar topics of interest, at its facilities in Dublin, Ohio, to aid the unfoldment of the Graduate Student Development Initiative.

OCLC is very interested in the needs of students and universities for timely information about new research results. We provide a number of related services such as WorldCat, Electronic Journals Online, and FirstSearch. If there is interest from NDLTD members as your project matures, we will be happy to explore solutions for self-sustainable services related to the preservation, archiving, and accessing of the scholarly materials produced through the Graduate Student Development Initiative.

Sincerely,

Terry Noreault, PhD
Vice President
Office of Research
May 15, 2000

Professor Edward A. Fox
Department of Computer Science
Virginia Polytechnic Institute and State University
660 McBryde Hall, M/C 0106
Blacksburg, VA 24601

Dear Ed:

It is my pleasure to write on behalf of the Southeastern Library Network in support of Virginia Tech’s FIPSE initiative. SOLINET is a not-for-profit cooperative of over 800 member libraries in the southeastern United States, several of which would be directly involved in the implementation of your project. Their efforts, and the efforts of the project as a whole, would benefit our entire membership.

Members of SOLINET staff and board have been involved in the development of the Networked Digital Library of Theses and Dissertations since its inception. We continue to believe that the goals of the program are timely and will have wide benefits, both to participating institutions and to library users from other institutions. The benefits to libraries are in becoming more competent in creating and managing digital resources as well as streamlining processes and stewarding valuable library space.

Although the leadership provided through Virginia Tech has been instrumental in showing just how practical and replicable the processes developed through NDLTD are, and in building a groundswell of national and international support, there is still much work to be done. A recent survey of our members shows that many institutions still need help in building the basic skills to become providers of digital information. Building this skill base is critical as universities prepare for distance learning and support of remote users. There is still a need to build the critical mass necessary for a sustainable, interoperable, and international program.

Since several of the participating institutions are in the SOLINET membership area, and the project outcomes will benefit all of our members, we would be happy to provide the following support for this project:

- SOLINET training facilities may be used to host meetings and hold training sessions;
• SOLINET staff will continue to serve on the steering committee;
• SOLINET will help coordinate NDLTD efforts and promote the NDLTD among our membership;
• SOLINET will work with NDLTD to develop training curricula and materials for NDLTD.

Thank you for the opportunity to comment on your proposal. For many of our academic members, it has the potential to transform their participation in the exchange of scholarly information in very positive ways.

Sincerely,

Kate Nevins,
Executive Director
United Nations Educational, Scientific and Cultural Organization  
Organisations des Nations Unies pour l’éducation, la science et la culture

REF.: DIR/CII/USP/2000/69  
10 May 2000

Dear Dr. Fox:

I am pleased to write, as a Member of the Steering Committee of the NDLTD representing UNESCO, to support Virginia Tech’s FIPSE proposal for the Graduate Student Development Initiative. As you know, UNESCO and particularly the Communication, Information and Informatics Sector (CII), has been interested for some time in the electronic transmission and storage of documents, particularly of theses and dissertations. It is our belief that these documents constitute a rich resource of research literature that to date has not been fully utilized, and which could be of great benefit to the Member States of UNESCO.

UNESCO/CII is pleased to have been involved with the Electronic Thesis and Dissertation Project for the past few years. We expect that by using computer technology, theses and dissertations will undergo a transformation similar to that now underway in electronic journals. The proposed project, in concert with the Open Archives Initiative, will greatly benefit graduate schools of all sizes by making information more accessible to all.

The Graduate Student Development Initiative is particularly promising because it involves a partnership between Virginia Tech and four other graduate institutions. These partnerships can be highly successful by leveraging the particular expertise of each institution toward the goals of the project. Moreover, this project will enhance the experience of all five institutions with ETDs so that they can serve as models for other institutions interested in starting an ETD program.

Thank you for keeping me informed of new developments as your project progresses. I will in turn make this project better known at UNESCO.

The project will undoubtedly move the technology and practice in the direction of better use of theses, dissertations, and other research documents. It is for this reason that we at UNESCO strongly encourage FIPSE to support this proposal. We will closely follow the project as it develops, and you may count on our full cooperation in this important effort.

Yours sincerely,

M. Tawfik  
Director, Unit for Special Projects  
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Appendix D. NDLTD Membership, Growth, and Access

The following tables and figures further explain NDLTD, and are referred to in the proposal narrative.

Table D.1  NDLTD Membership

<table>
<thead>
<tr>
<th>USA Universities (43)</th>
<th>International Universities/Libraries (40)</th>
<th>Supporting Institutions (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air University (Maxwell AFB, AL)</td>
<td>Australian National University</td>
<td>Coalition for Networked Info. (CNI)</td>
</tr>
<tr>
<td>Baylor University</td>
<td>Biblioteca de Catalunya (Spain)</td>
<td>Committee on Institutional Cooperation (CIC)</td>
</tr>
<tr>
<td>Brigham Young University</td>
<td>Chinese University of Hong Kong</td>
<td>CBUC (Consorci de Biblioteques Universitaries de Catalunya, Spain)</td>
</tr>
<tr>
<td>California Institute of Technology</td>
<td>Chungnam National U. (S. Korea)</td>
<td>Diplomatica.com</td>
</tr>
<tr>
<td>Clemson University</td>
<td>City University, London (UK)</td>
<td>Dissertation.com</td>
</tr>
<tr>
<td>College of William and Mary</td>
<td>Curtin University of Technology (AU)</td>
<td>Dissertationen Online (GE)</td>
</tr>
<tr>
<td>Concordia University (IL)</td>
<td>Darmstadt University of Technology (GE)</td>
<td>Ibero-American Sci. &amp; Tech. Ed. Consort. (ISTEC)</td>
</tr>
<tr>
<td>East Carolina University</td>
<td>Freie Universitat Berlin (GE)</td>
<td>National Documentation Centre (NDC), Greece</td>
</tr>
<tr>
<td>East Tennessee State University</td>
<td>Gerhard Mercator U. Duisburg (GE)</td>
<td>National Library of Portugal</td>
</tr>
<tr>
<td>Florida Institute of Technology</td>
<td>Griffith University (Australia)</td>
<td>Online Computer Library Center (OCLC)</td>
</tr>
<tr>
<td>Florida International University</td>
<td>Gyeongsang National U., Chinju (S. Korea)</td>
<td>Org. of American States (OAS)</td>
</tr>
<tr>
<td>George Washington University</td>
<td>Humboldt-Universitat zu Berlin (GE)</td>
<td>UNESCO</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>Indian Institute of Technology, Bombay</td>
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<tr>
<td>Marshall University (W. Virginia)</td>
<td>Nanyang Technological U. (Singapore)</td>
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<tr>
<td>Miami University of Ohio</td>
<td>National Library of Portugal</td>
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<tr>
<td>Michigan Tech</td>
<td>National U. of Singapore</td>
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<tr>
<td>MIT</td>
<td>Rhodes University (South Africa)</td>
<td></td>
</tr>
<tr>
<td>Naval Postgraduate School (CA)</td>
<td>Shanghai Jiao Tong U. (China)</td>
<td></td>
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<tr>
<td>New Mexico Tech</td>
<td>St. Petersburg State Technical U. (Russia)</td>
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<tr>
<td>North Carolina State University</td>
<td>Universidad de las Américas Puebla (México)</td>
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</tr>
<tr>
<td>Pennsylvania State University</td>
<td>Universidad Politecnica de Valencia (Spain)</td>
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<tr>
<td>Rochester Institute of Technology</td>
<td>Universitat Autonoma de Barcelona (Spain)</td>
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<tr>
<td>U. Colorado, Health Sciences Center</td>
<td>Universitat d’Alacant (Spain)</td>
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<tr>
<td>University of Florida</td>
<td>Universitat de Barcelona (Spain)</td>
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<td>University of Georgia</td>
<td>Universitat de Girona (Spain)</td>
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<td>University of Hawai, Manoa</td>
<td>Universitat de Lleida (Spain)</td>
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<td>University of Iowa</td>
<td>Universitat Oberta de Catalunya (Spain)</td>
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<td>University of Kentucky</td>
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<tr>
<td>University of Maine</td>
<td>Universitat Pompeu Fabra (Spain)</td>
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<tr>
<td>University of North Texas</td>
<td>Universitat Rovira i Virgili (Spain)</td>
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<tr>
<td>University of Oklahoma</td>
<td>Université Laval (Québec, Canada)</td>
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<tr>
<td>University of South Florida</td>
<td>Universiteit Utrecht (Netherlands)</td>
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<tr>
<td>University of Tennessee, Knoxville</td>
<td>University of Guelph (Ontario, CA)</td>
<td></td>
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<tr>
<td>University of Tennessee, Memphis</td>
<td>University of Melbourne (AU)</td>
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<tr>
<td>University of Texas at Austin</td>
<td>University of New South Wales (AU)</td>
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<tr>
<td>University of Virginia</td>
<td>University of Pisa (Italy)</td>
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<tr>
<td>University of Wisconsin, Madison</td>
<td>University of Queensland (AU)</td>
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<tr>
<td>Vanderbilt University</td>
<td>University of Sydney (Australia)</td>
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<tr>
<td>Virginia Commonwealth U.</td>
<td>University of Waterloo (Canada)</td>
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<tr>
<td>Virginia Tech</td>
<td>Wilfrid Laurier U. (Ontario, CA)</td>
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<tr>
<td>West Virginia University</td>
<td></td>
<td></td>
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<tr>
<td>Western Michigan University</td>
<td>Note:</td>
<td></td>
</tr>
<tr>
<td>Worcester Polytechnic Institute</td>
<td>Sites shown in italics require ETDs.</td>
<td></td>
</tr>
</tbody>
</table>
Table D.2  Locations of NDLTD Members in USA, foreign countries.

<table>
<thead>
<tr>
<th>25 of 51 USA Locations (50+DC)</th>
<th>16 Foreign Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL, AK, AR, AZ, CA, CO, CT, D.C., DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NV, NH, NJ, NM, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY</td>
<td>Australia, Canada, China, Germany, India, Italy, South Korea, Mexico, Netherlands, Portugal, Russia, Singapore, South Africa, South Korea, Spain, United Kingdom</td>
</tr>
</tbody>
</table>

Figure D.1  NDLTD Membership Growth
Figure D.2 Access status for Virginia Tech ETDs

- Worldwide: 54%
- IP-restricted: 19%
- VT-only: 24%
- Mixed: 3%

Figure D.3 Numbers of access to pages with information for students.

Figure D.4 "How-to pages" compared with rest of accesses.
Appendix E. References


