Center for Teaching and Learning

Proposal Cover Page

Date: October 25, 2000

Project Title: **DU LIS /collab: Phase 2 "Sharing the Wealth"**

Requested Amount: $33,523 ($19,523 Laptops & Curric; $14,000 Teaching & Curric.)

Proposed Duration: 4 Quarters

Requested Starting Date: Immediate

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Approvals:

Signature of Department Head: _____

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Signature of Division Head: _____

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Section 1 Introduction: Describe the nature of the project, its educational objective, and how it is related to the curriculum as a whole.

This proposal seeks CTL funds in part from the *Laptops and the Curriculum* program, and in part from the *Learning and the Curriculum* program.

The **nature of the project** is two-fold:

- to support the Library Information Science program's ongoing research and development work ***creating and using*** advanced technologically-enabled collaborative information environments for teaching, learning, and curricular outreach; and
- to ***"share the wealth"*** of tacit and explicit knowledge generated by this activity with the 300+ students and 20+ faculty in LIS's sister programs in the College of Education.

This project relies on student involvement for a "bottoms up" complement to Dr. Sitter's currently funded CTL grant addressing the information and technology literacy needs of COE faculty.

Students Impacted by this proposal: 400+
Programs Impacted by this proposal: 6
Faculty Impacted by this proposal: 20+

Funds requested in this proposal will be used to support two simultaneous **GOALS:**

1. **expand student involvement** in and continued development of the next phase of the DU Library Information Science Collaboratory, or /collab;

2. enable crosscutting, interdisciplinary, technology-based literacy **outreach through peer-to-peer knowledge networks** between LIS students and the 300 students in the five other programs in College of Education.

Specifically, this proposal seeks funds for **three student participants** and **three laptop computers** for the Library Information Science Program's /collab, and for various expenses and travel support associated with that work.

Funds will be used to achieve the following **OBJECTIVES:**

1. provide expanded opportunities for involvement in the LIS /collab for the second generation of students (80+ students) by funding student teaching assistance and peer tutors for the LIS curriculum. Students will provide technology support during critical early uptake and advanced collaborative research projects; and support continued development of the /collab environment and projects, including original computer programs and research projects described later in this proposal;

2. share LIS's core knowledge and technological literacy with LIS's five sister programs in the College of Education (300+ students) by creating multidimensional, boundary-spanning peer-to-peer knowledge networks at the individual, group, course, program, and college levels.

Background:

In summer quarter 2000 the **Library Information Science Program** http://www.du.edu/LIS launched the DU LIS Collaboratory, or **/collab**, a "common information space" for LIS students on the DU UNIX server. The purpose of the /collab is to explore, develop, and integrate advanced use of information technology and foster technology-enabled collaboration outreach skills across the library school curriculum. The first generation /collab project has been an extraordinary success. The web interface to the DU LIS /collab is at http://www.du.edu/LIS/collab

The DU LIS /collab is a technology-enabled learning, literacy, research, and outreach platform that includes development of common research spaces and services, digital library resources, automated research processes, collaborative learning environments, and original software programming to support these activities. Forty student enrolled in four different LIS classes currently participate in Phase 1 of the /collab, and are affectionately called ***"labrats,"*** a linguistic reduction of "colLABoRATory."

The current generation of labrats is engaged in an inter-quarter, inter-course research project for the National Association of Independent Schools. The project explores relations known between library media specialists (school librarians) and school library. Information about the Independent Schools research project is online in the /collab, as are details about the three other research and outreach projects on the /collab's proposed three year agenda. The first generation /collab work was presented at the Colorado Library Association Annual Conference in September and the /collab has an opportunity to present its work at the Global Informing Science Education www.is2001.com conference in Krakow, Poland next summer.

Educational Objectives:
Relative to the first goal and objective: to **support continued growth of the LIS /collab**, we seek funding to provide peer support for the 80 students expected to participate in Phase 2 of the DU LIS /collab. The /collab is an organic, evolutionary, self-determining technology-enabled collaborative environment. Phase 2 activities will be determined by the labrats, but will be directly tied to the LIS's program goals and course objectives. Phase 1 activities include tooling up and negotiating /collab procedures, design and execution of the original technology-based environment, design and execution of an original research project, development of original software programming to support these activities, and technology literacy outreach. Phase 1's activities and achievements, including details about the original software under development, are narrated below to evidence the project's continued viability and potential for significant results.

Relative to the second goal and objective: to **"share the wealth**," of tacit and explicit knowledge generated by /collab activities, we seek funding to create boundary spanning peer-to-peer knowledge networks between LIS students and the 300+ other students in the College of Education. "Share the wealth" is based on LIS program's imperative to integrate our technological expertise into the five programs we've joined by moving to the College of Education. Technological literacy among faculty, staff, and students in COE is very low. COE faculty and students have a critical need for core tech and information literacy. The LIS program has only 2.5 faculty, making it difficult to provide fellow faculty the attention and support they so desperately need, and making it nearly impossible for us to provide the faculty-to-student interaction required to cultivate widespread and

quick literacy in the COE's larger student body. Dr. Clara Sitter's current CTL-funded project, which addresses the COE faculty's immediate information literacy problem, and her "tips and tricks" workshops for COE faculty, have produced significant results and are positively received by COE faculty. Dr. Sitter's work has opened the door for additional boundary spanning by establishing trust and confidence between LIS and COE. The "share the wealth" portion of this proposal builds on and complements Dr. Sitter's work by providing LIS students an opportunity to share their expertise and knowledge about technology through creation of student-to-student and student-to-faculty peer knowledge networks that will address the problem "from the bottom up," that is, from within and between the student populations.

The objectives of "share the wealth" will be accomplished by:

- LIS student mentors, who will be available to enable and support COE faculty's specific and individual need to understand and integrate technology knowledge into the COE curriculum (i.e. development of web-based resources, technology-enabled communication flows, guided searching and retrieval, etc.); and

- LIS student peer mentors who will be available to provide core literacy training and guidance for the 300+ students in the College of Education's five other programs.

Included in the core skills taught in the LIS program are information and technology needs diagnosis and mediation. Under the guidance of LIS faculty, the LIS students will serve as "bridges" between the LIS program and the student body and faculty of the five other programs in College of Education. LIS students will provide services and support in a variety of ways and a variety environments, all of which will be determined during LIS's unique channel, content, and context-focused user-centered process of needs determination.

Specific activities might include

- designing and presenting group and individual remediation activities,
- presenting technology "boot camps,"
- providing tech and information related teaching assistance for COE faculty,
- providing individual and group tutoring and design support;
- serving as guides and mentors for specific courses and student research projects; and
- building individual and group peer relationships about technology, using technology

As an example, work already underway brings together students in dr. twining's advanced technology class in the LIS program and students in Dr. Lovell's policy and law course in the Higher Ed program. These students are working together virtually. COE students submitted requests for information assistance specific to a research assignment, and LIS students are creating pathfinders include recommended sources, query formations, and providing technology-enabled peer assistance. As this type of peer-to-peer outreach continues, LIS students will create a "presence" in the COE environment, and will use their professional skills to enable and empower effective and efficient use of technology in the College. As human bridges, LIS students will span the artificial boundaries between the disciplines and programs by sharing their wealth of knowledge. This contact will provide a conduit for delivery of basic technology and information literacy skills, and will lead to the creation of an interdisciplinary technology-enabled collaborative learning and research environment.

About Collaboration and Collaboratories:

Collaboratories and collaboration are hot topics in academic programs across the curriculum and around the globe. Collaboration and collaboratories are of particular interest to **library information science**, which is concerned with the act and environment of the data-information-knowledge transfer process *as a whole* and specifically with enabling the diffusion and preservation of knowledge across the disciplines.

Collaboration is promoted by futurists as the "way to work" in the new millennium. Collaboratories are virtual or tech-enabled environments that facilitate that way of working. Collaboratories overcome the constraints of space and time. They facilitate the economical and ecological use and diffusion of rare and expensive equipment and expertise. They provide for the diffusion and preservation of knowledge created as a result of their exercise. However, much needs to be learned about both the act and the environment. Despite its memic appeal, collaboration is not "cooperation," and it is not "coordination." Collaboration, the act, is a fundamentally different way of working together (Winer & Ray 1994). And collaboratories are a fundamentally different type of work space/place (twining 1999).

Since 1988, when the National Science Foundation first announced its program-wide initiative to support development of collaboratories, or "laboratories without walls," the federal government has invested billions of dollars in direct and indirect support of the collaboratory platform, and in interface design, and implementation. NSF is just beginning to fund research into the social, cultural, and organizational implication of these environments, and also beginning to invest in research concerned with diffusion of generated knowledge. Currently, eight of the US National Laboratories have functioning collaboratory interfaces, and the national "information problem" has become ***how to incorporate collaboratory principles and practices into curricula across higher education***. Doing so will prepare students across disciplines and retool academicians to work together in these virtual laboratories. A complete analysis of the national collaboratory initiative and the resulting first generation platforms are described in twining's (1999) dissertation *"A Naturalistic Inquiry Into the Collaboratory: In search of understanding for prospective participants,"* which is online at http://intertwining.org/dissertation . The DU LIS /collab project and this "share the wealth" proposal are practical extensions of that dissertation research.

The DU LIS /collab was initiated to accomplish two core LIS program goals: to integrate technology across the LIS curriculum and to foster collaboration. It has done both. The /collab helps students explore the concept of collaboration (the individual and group act) while also exploring, mastering, and developing creativity in the use of the technical, or virtual environment. In the process, LIS students are discovering how to enable effective and efficient uptake in others, and how to support the intellectual, emotional, and informational needs of participants from a variety of disciplines. The third goal of the DU LIS /collab is to begin addressing the national problem of "sharing the wealth" of knowledge about and from within collaboratories and virtual collaborations. At its largest level this proposal seeks to discover ways we might best equip students with the core competencies required to participate in national collaboratory activities while simultaneously fostering the first generation of "collaboratory librarians," who will be major contributors to the diffusion imperative.

Librarians have not been involved in the design and implementation of national collaboratory projects, and the design and functionality of the collaboratory interfaces suffers for lack of their expertise. The time of the "collaboratory librarian" has arrived. NSF apparently agrees, as witnessed by its new requirement that librarians and LIS researchers be involved in all National Information Infrastructure initiatives. By incubating the project in the Library School, DU is generating the nation's first crop of "collaboratory librarians" who will be conceptually prepared and tooled up to support the uptake of collaboratory activities across the larger academic and scientific communities. It is an expected consequence of this early literacy work that DU LIS students will be prepared to ***engage with the larger DU community*** and assist hard and soft disciplinarians with the work of incorporating collaboratory and collaboration-based learning and research activities into their programs.

About the LIS /collab:
The core design of the DU LIS /collab is based on the criteria for inclusion developed in the CIRAL matrix (twining 1999) which distinguishes between a collaboratory and an interactive web space. The DU LIS /collab takes this fundamental design one step forward by *also* incorporating the basic principles of information ecologies (Nardi & O'Day 1999, 61), which focus on people, practices, values, and technology, and the fundamental principle of technological economy, which mandates maximizing the effective and efficient use of EXISTING systems and resources before new technological investments are considered.

In the formative stages of the /collab, the DU LIS program met with Bob Stocker and Carol Taylor of DU's University Technology Services to discuss the /collab design and garner support for the project. Support was enthusiastically and immediately given. The labrats continue to work closely with UTS as the design of the /collab evolves. This experience helps them understand technology from the systems perspective and helps them incorporate the systems perspective into their user-focused design and outreach work.

DU UTS facilitated the /collab design by configuring the desired "common information space" (Bannon and Bodker 2000) on the existing DU UNIX server. This "common information space" is a single space that supports multiple simultaneous logons and intradocumentary interactions. The /collab is an "open" space in that all the normal file and architecture restrictions are removed, allowing students full control over the design of the architecture, infrastructure and interface. This allows the design to evolve ***based on actual need***, rather than having it imposed based on perceived need, a fundamental flaw of the US National Laboratory collaboratory design.

How the /collab is different:
The traditional configuration of community servers assigns individuals small spaces in a "honeycomb" fashion: that is, each person gets one small bit of space over which they have exclusive control. What happens in this configuration is that hundreds (or thousands) of people work individually "side by side" on common technology, without being aware of or involved in what's happening in the next "cell" of the honeycomb. To compensate, we use pseudo-collaborative software that allows communication (email) among the individual cells, and manages documents either as redundant dataflows or as "published" and captured documents that forbid multiple, simultaneous inter- and intra-documentary interactions. DU UTS has addressed a portion of this problem by creating "public" and "private" drives, but nevertheless, these configurations have

restrictions that interfere with the unimpeded exploration and design of technological environments to enable unfettered collaboration and collaborative knowledge creation.

The "common information space" configuration of the /collab addresses both of these information problems by creating one space to hold the authoritative documents, while allowing multiple, simultaneous users equal and unimpeded access to interact with each other ***within*** the documents and within the equally shared larger space (environment) in which the document resides, and to structure this common space creatively to facilitate the tasks at hand and support development of new ways to create common understanding.

UTS further supported the /collab project by arranging that all the files in the /collab be automatically and efficiently compressed and archived once per week, thus providing for future research into the organic growth of the space. In addition, the space was configured to be "self expanding" in that as each new student signs up to participate, the space increases in size equal to, and in addition to, the amount of space the individual students are granted for their student accounts. This "self-expansion" allows the participants, as a whole, to harness the power of combined storage capacity, thus exceeding collectively what they could individually, a fundamental lure of collaboration.

Phase 1 Development and Achievements

In summer 2000, fourteen students signed up for the first phase of the /collab project, and were handed the space (which at this point was empty) without constraints or preconceived notions about ***how*** they might develop it…. they were invited to "play" with the space with no threat of judgment and no implications for their course grade. They had ten weeks to make of it what they could. This required that the faculty take an andragogical rather than a pedagogical approach to the learning experience, and participate as an equal in the work, an approach described by one labrat as "…everyone putting their intellectual tools on the table and letting the group use them as needed to

The first phase of all successful collaborations is arrival at a "shared vision." The LIS faculty and staff provided four ideas for possible /collab projects, and the first group of labrats adopted the first project for their shared vision. They used this shared vision it to "break ground" on the /collab. The shared vision for the first project is to conduct and publish a research article exploring "relations known" among school library media specialists (librarians) and school library technologist for an invited article in the upcoming special issue about libraries in the Journal of the Association of Independent Schools. The labrats decided to publish their research as the DU LIS program, without individual author names, thus making real the notion that the /collab will be an inter-quarter, inter-course program-wide theory-based research effort that is individually indistinguishable…a true collaboration. The secondary goal, articulated by the labrats themselves, is to bring national attention to the DU LIS program during its upcoming accreditation review. The primary faculty advisor to the /collab provided basic instructions for using the technology, and served as a guide for the students through the research process. The faculty and staff of the Library School, ***as a whole,*** agreed to support student inquiries and provide guidance individually and collectively as needed.

Section 2 Approach: Explain how the educational objectives are to be achieved and how they will be assessed.

This approach to learning and development is evolutionary: that is, it does not respond well when rigid expectations and criteria are in place, or imposed. Participants must be free to explore, for that is truly what they are doing: exploring and staking new intellectual territory. There is no existing map to the territory, all horizons are new, all discoveries are original, and all aspects are creative. In the process, the faculty, staff, and students learn together how to sharpen their critical thinking skills, how to work together within a self-determined and self-organizing information infrastructure, and how to function individually and collectively in a chaotic information environment. Minimally, participants learn the core skills required of information professionals in the "new" information age. But, the most interesting possibilities are on the maximum end of the learning curve.

A key criteria for success of collaborative endeavors is to take a nonlinear, non-authoritarian approach to the development of skills and knowledge: to allow individual buy-in at the individual's comfort level, and facilitate individual and collective development without threat of failure or long-term consequences (such as impact on GPA, or peer perception.) The DU LIS /collab experience was designed so that individually and collectively we would try our best to ***"fail spectacularly,"*** meaning we would be free to be creative and risk-taking without the consequence of grades, and without expectation for success. This approach works magnificently, and the first generation of the /collab succeeded spectacularly!

The first task of the first generation of labrats was to conduct a collaborative literature review. Literature reviews are a primary component of library information science education and professional practice: that's what we do: discover and facilitate pathways through the public knowledge for ourselves, and for our patrons. LIS students are familiar with the traditional, individualistic approach to this task. An emerging area of interest in LIS research is collaborative lit reviews: how to conduct them and how to orchestrate them for patrons of library and information services. During the process of their work, labrats designed and configured a unix-based system to support this task, including writing an original computer program to automate the lit review subsystem ('**addnew**' a program that has significant commercial potential) The program automatically compiles individual search results into a collaborative annotated citation document.

At this point in the evolution of the /collab, the labrats raised the issue of security, agreeing to restrict the concatenated file by imposing write restrictions on the master document, thus assuring that their collective work would not be inadvertently erased by one of the participants. The labrats designed and executed this program. The labrats soon discovered that not everyone was comfortable working at the UNIX command line, and began converted the documents to hypertext markup language in order to facilitate ease of access and public viewing via the web. From this exercise, the labrats began developing a second generation to their program: to automatically convert the auto-concatenating lit review to hypertext markup language and to automate its publication as a web document in the /collab space. This work brought the first needs-based order to the chaos, and provided most of the students their first exposure to the computer program development process.

Shortly thereafter, /collab students began working on the third generation of their collaborative litreview program by designing, executing, and automating a program that allows new groups of

users to set up their own space in the /collab to begin a collaborative lit review project. We believe this program has serious commercial potential and are confident that the 300+ Master's and Doctoral level students in the five other programs in the College of Education will find it a useful tool for their individual and collective research projects. Phase 2 of the /collab project will lead to the completion of this program, and provide the opportunity to share it with a new population, and to perfect its design based on their need.

From there, the web interface at http://www.du.edu/LIS/collab began to evolve. Using a distributed email list, the students engaged in very active exchanges between class meetings, collaborating on their search strategies and keeping each other informed of their activities so as to avoid duplication of effort and achieve the 'strength in numbers" collaboration promises. Eventually, they drafted the first section of the literature review for the research project, finding that the major problem between librarians and techies is a fundamental difference in understanding about what it means to collaborate.

During this process, one of the students discovered a recent Master's paper from the University of North Carolina Library School that explores "relations known" between school librarians and technologist. The students contacted the author, discussed the implication of and negotiated use of this study by our project, obtained a digital copy of the paper along with its instrument, obtained copyright clearance to deposit it in the DU LIS /collab, and designed the ***/collab library*** to make that paper available to project participants. A subgroup of labrats are currently working on converting the instrument for web-delivery, including automated analysis of survey results, and will hand the instrument over to the second generation of labrats for execution and results analysis.

After the early and steep technology learning curve, the labrats began characterizing /collab activities as social, rather than technological; the technology quickly faded into the background and the environment became one of technologically enabled human interaction. Arising from this observation is a strong pocket of interest in exploring the social aspect of virtual collaboration, and specifically, how language and communication can be developed to mediate the absence of "meat" and promote understanding and use of technology for collaboration ***across the curriculum***. This need for understanding creates the opportunity for which this proposal seeks funding: to work closely with other COE students, in the process sharing with them the core information and technology skills they need for professional success, while introducing them to the emerging generation of collaborative technology including and the process and product of the /collab's lit review program, and receiving from them valued input and comments that will help the /collab grow.

It should be noted that these (and many other) activities were done IN ADDITION TO the traditional activities required by the 10-week CORE courses for the LIS Master's Degree. As part of the course requirement, each student also wrote and published (in the /collab library) a scholarly paper about some aspect of management of information organizations. These papers include a paper developing a preliminary theory of virtual management, and another paper addressing the problem of integrating technology across the curriculum (which was presented as a complement to the /collab presentation at the Colorado Library Association conference in September.) The significance of having the /collab as a platform for collaborative learning during this traditional paper-writing component of graduate education became apparent when students began to publish, read, and

discusses each other's papers *during the writing process*, AND began imagining how they might incorporate into the /collab design a system to facilitate online peer review of scholarly papers, and another system to allow annotation of commonly held electronic documents. Both of these ideas have international implications, and are in fact the subject of leading edge research in LIS programs around the globe.

To facilitate survival of the first generation /collab work at the end of the ten week course, and to create an environment in which the work could survive across courses and quarters, the labrats created and published a Gantt chart for the Independent Schools project, wrote and published documentation and help files for their technical work, and created a preliminary roadmap for the next generation of participants, specifically requesting that they pick up the work by continuing the literature review to incorporate factors that contribute to success in the early phases of a proposed collaborations. In the course of this finalizing work, the students worked together to design and perfect the file infrastructure of the /collab. One student preserved all the email exchanged between the first generation labrats to test the application of Egghe's (1991) concavity theory as a measure of effective collaboration, and intends to pursue this research as a collaborative capstone project.

Work on the Independent Schools research project and evolution of the /collab environment continues in three courses in the current quarter. A core course in the LIS program's Library Information Resources and Technology (LIRT) concentration took up the task of continuing the lit review to develop definitions of collaboration and also began early collaboration activities with another COE class; the second class, LIS's core organization course, began working on development of an ontology for the /collab's digital library (which will be used to design a search interface to an interdisciplinary citation file using the combined collaborative lit review documents); the third course, in the LIS program's Advanced Certificate and Knowledge Management (KM) cognate, began creating the web-based research instrument we'll use to replicate the Master's study among Independent Schools in Colorado.

All together, over 40 students are involved in the Phase 1 of the collaboratory, and students who are NOT involved are asking for the opportunity to participate. It is significant to note that students who were enrolled in the first /collab course but who are NOT enrolled in current courses with /collab components are still ACTIVELY involved in /collab activities. The LIS /collab has indeed become a vehicle with which students are connecting and working together between and among courses, and between and among programs. It has become the intertwining element imagined when we speak about the integrative power of technology.

Funding for the three students and three laptops requested in this proposal will

- help LIS faculty in the orientation and core training necessary for students to begin working in the /collab;
- supply key technology support to the labrats as they continue building the /collab project and conducting collaborative research in the environment;
- contribute to Dr. Sitter's development of online resources specific to supporting COE faculty literacy;
- Support continued development of original collaborative software;
- support the basic research, publishing, and presentation imperative of the /collab; and
- diffuse /collab knowledge among the larger COE student body by:

- providing peer mentors and knowledge networking in core tech literacy, and
- demonstrating what it means to ***BE*** technologically literate (vs. the classic approach to tech literacy, that is: how to DO technology.)

Evaluation Criteria
Key to the success of the labrat's near meteoric uptake of rudimentary and advanced technology is their exposure to and understanding of the philosophical, theoretical, and practical foundations of "twinings laws for computer users." Although these 'laws' seem quite elementary, they provide the intellectual and emotional foundation for fearless uptake of technology. Understanding these laws, and demonstrating their use as a ***technological behavior,*** helps spread literacy. Diffusion and reliance and use of these laws will be a core measure of this proposals success. Faculty and student participants in this project will be expected to demonstrate their understanding, respect, and reliance on these laws as a measure of their technological literacy.

twining's laws are:

1. think before you click
2. read the help files
3. save early, save often
4. the first answer is always 'it depends'
5. the network will fail, count on it

Section 3 Logistics: Include the faculty that will be involved, how the resource will be dispersed, who will manage the project, and a timeline for implementation.

LIS clinical assistant professor, joanne twining, will serve as project manager. The LIS faculty and staff ***as a whole*** will work collaboratively to support the project. The funds requested will be used to equip and fund three students for ten hours a week during four consecutive quarters of their coursework and research.

Because of the evolutionary nature of this new, collaborative, technologically-enabled learning environment, it is difficult to say ***where*** we are going, and ***how*** we will get there, but certainly evidence to date indicates no lack of enthusiasm or willingness to continue growing the system. The LIS /collab provides opportunity to bring attention to DU's commitment to innovative and creative use of technology for teaching and learning, and clearly demonstrates how technology can be used to cross curricular boundaries and create new learning environments.

The next generation /collab is ready to be built. It will not be built on one person's vision, but on a mutually created, and collaboratively determined, shared vision. Arriving at that vision will be the first task of Phase 2.

Equipment Needs
The students involved in this work need access to project-dedicated ***laptop computers*** so that their work can be done virtually, as student need, inspiration, and location demands. Because of the traffic load of the work, and the need to archive and analyze /collab activities for research, they are unable to use either public computers or their own personal computers for this work. One of the laptop

computer requested in this proposal is the one currently provided by the Center for Teaching and Learning to facilitate faculty connectivity while the LIS program moves physically from its offices in the International House to its new offices in Wesley Hall. We would like to ***purchase this existing laptop*** from CTL as part of this proposal to support continued and uninterrupted faculty involvement.

Conclusion.
In its very short but meteoric life, the /collab has provided sufficient proof that it can achieve its intention: to integrate technology across the curriculum, to support innovative teaching and learning, to engage students in new ways of doing things, to provide and mentor professional growth and innovation, to foster new technologically-enabled bonds across academic disciplines, and to contribute to the spread of technological literacy generally.

It is a unique imperative of Library Information Science to ***share*** its resources and knowledge across time and place. By providing the labrats with the support they need to continue their creative growth while simultaneously reaching out to the COE student body, we will be developing a new model for interdisciplinary creation and diffusion of intelligence, understanding, and knowledge. The opportunity will allow some 400 students to explore the delicate relations between disciplines, about tacit and explicit knowledge related to technology, and discover effective and efficient ways to cross artificial intellectual boundaries and learn to share the wealth uniquely created by the integrative use of technology in the learning process.

Center for Teaching and Learning Budget

	Requested from the CTL	Other support	Total
Costs			
Salaries Three students @10 hrs/week/@$15/hr x 4 quarters each	$18,000		$18,000
Fringe @ 8.46%	$1523		$1523
Equipment Existing laptop (on loan from CTL) Two laptops for students	$3000 $6000		$9000
Materials & supplies	$1000		$1000
Consultants	0	0	0
Other -Travel	$4000		$4000
TOTAL	$19,523/ Laptops & Curriculum $14,000 / Teaching & Curriculum _____ $33,523		$33,523