LITRE Annual Report on Faculty Grants
(October 2006)
Prepared by LITRE Assessment Committee

EXECUTIVE SUMMARY

LITRE's purpose is to improve student learning through a collection of projects in which faculty systematically investigate the effectiveness of incorporating technology into their curriculum and pedagogical practices and assess its impact on student learning. Through ongoing investigation focusing on student learning, highlighting successes, and sharing information, LITRE aims to foster an environment of innovation, encourage the repetition of successes, shape future investigations, and inform campus decision-making.

This report synthesized findings from LITRE Grants in 2005-2006. The LITRE Assessment Committee (LAC) reviewed available reports from the PIs of the LITRE-sponsored projects. Although the assessment activities in the grant projects varied in quality and depth, several themes have emerged that show how students use technology to improve their learning.

Five themes that showed how students used technology to improve their learning emerged:
a) Enriched content led to increased knowledge.
b) Visualization of material facilitated student learning of the material.
c) Communication/collaboration among peers and experts increased learning and feedback on student learning.
d) Motivation for learning increased with more technology usage.
e) Technology stimulated students' engagement with learning material and as a result students learned more.

The LITRE assessment committee also identified some difficulties with implementing the LITRE plan as written. Some of the grant projects were too small to assess learning effectively, some assessment plans were difficult to implement within the grant year, and LITRE did not have enough resources to support assessment activities. Nonetheless, in its first phase, LITRE was very successful in stimulating innovations and in exploring fundamental lessons about assessing student learning.

Based on the findings in this report, the LAC recommends 1) focusing on 3-5 large projects during the next phase of LITRE and 2) improving assessment activities and developing a common framework for analysis and reporting of LITRE projects.

Table of Contents

INTRODUCTION

LITRE's ultimate purpose is to improve student learning through a collection of projects in which faculty systematically investigate the effectiveness of incorporating technology into their curricula and pedagogical practices and assess its impact on student learning. Through ongoing investigation focusing on student learning, highlighting successes and sharing information, LITRE aims to foster an environment of innovation, encourage the repetition of successes, shape future investigations, and inform campus decision-making.

In 2004, under the leadership of mathematics professor Lavon Page and a LITRE Advisory Board, LITRE was launched with three large first-wave projects (see separate report) [1] and a small faculty-grants program (see http://litre.ncsu.edu/ for individual grant details). To date, 41 faculty grants have been awarded, ranging from $2500 to $10,000. The LITRE Assessment Committee's (LAC) reviewed reports provided by the PI's of the individual grants [2] and a synthesis of the findings from these grants is provided in this report. The grant reports varied in the quality, depth, and specificity of assessment activities and reporting. Some projects were too small to assess learning effectively, some assessment plans were difficult to implement within the grant year, and LITRE did not have enough resources to support assessment activities. Nonetheless, in its first phase, LITRE was very successful in stimulating innovations and in exploring fundamental lessons about assessing student learning.

Because the focus of LITRE is on student learning, LAC synthesized the reports by seeking emerging themes among the perceived effects of technology rich environments on student learning and looking at the effect of technology on teaching. In addition, LAC identified promising areas for future investigations for LITRE.

I. EMERGENT THEMES IN STUDENT LEARNING

LITRE projects examined what students were learning by a variety of methods, both direct (e.g. student generated content) and indirect (e.g. student perception surveys). Findings indicated that often students increased their knowledge through the use of technology. Five themes that showed how students used technology to improve their learning emerged:

A. Enriched content led to increased knowledge.
B. Visualization of material facilitated student learning of the material.
C. Communication/collaboration among peers and experts increased learning and feedback on student learning.
D. Motivation for learning increased with more technology usage.
E. Technology stimulated students' engagement with learning material and as a result students learned more.

Under each section below, a **few examples** from the grant reports are used to illustrate each theme.

---

[1] Reports from other LITRE activities (three reports related to ClassTech, one report related to the Collaboratory and one SLIC LMS usage report) are presented in a separate report.

[2] This report synthesized findings from 15 final reports from the LITRE grants funded in 2004, five progress reports from LITRE grants funded in 2005-2007 (Other grantee reports were received but were not used, as they did not contain assessment findings.) See appendix A.

A. Enriched Content Led To Increased Knowledge

Many reports indicated that technology enriched student's knowledge by providing additional information that they could not acquire elsewhere. The faculty developed richer context and content for learning through hyperlinks of text, multimedia, providing material outside of the standard textbook, providing real-world data, etc. By having more content and richer context, the students learned more and were able to apply knowledge in more detail and in greater depth than students in courses without technology. Many of these projects compared assessment results with results from the same course taught without technology.

Examples:

- Hypertext of Hegel's work gave philosophy (PHI 302) students more pointed information, increased their depth of knowledge, increased their ability to apply this knowledge to produce their own interpretation of the text and to apply the concepts to contemporary issues. This was assessed by reviewing student papers and using a rubric to compare them with papers from previous years' classes. (Bykova)

- Students in an introductory online music course (MUS 200. Two sections: 22 students and 31 students) who used the music clips, and audio and video media as desired by the music faculty, showed enhanced learning as demonstrated through written papers and journals. Students were able to explain the musical cultures in more detail and with more perception and within relevant cultural context. (Kramer & Arnold)

- Web-based archives developed for archaeology courses (ANT 495; 12 students: ANT 253; spring, 98 students; summer, 15 students) incorporated inquiry-based assignments (that complemented lecture and in-class discussion) to help students learn about world civilizations and the theories and methods archaeologists use in their research. The PI found that use of this pedagogy and technology was a beneficial strategy for answering complex questions. Students received "hands-on" experience using archaeological data and computerized techniques to discover how people lived. Students reported that the archives "made … abstract concepts more intelligible" and "enabled [them] to greatly understand interrelationships between climatic variations and human interaction, as well as a better understanding of the overall impact of humans on environmental changes." Portfolios of students' works and student surveys were used to determine effect on learning. (Fitzpatrick)

B. Visualization of Material Facilitated Student Learning of the Material

Technology allowed students to visualize the material in new ways. Faculty found that access to Internet, simulations, or use of concept maps enabled students to represent material in new ways. Students were better able to visualize the material and showed that they learned the required content.

Examples:

- Students in a business-writing course (ENG 332) were provided 10 online modules with content and examples of business and management writing. One module, letters for job applications, enabled students in the hybrid course to do better than those in the traditional classroom on writing their own job application letter. The students had access to visual examples and the in-class pedagogy was modified for the hybrid course that was held in a computer classroom. Student-generated writings (N=22) in this hybrid course were rated (using a rubric) and assessed along with writings from a previous “traditional” class. A student survey was also used to determined perception on effectiveness of technology. (Katz)

- Use of Maple software in class for visualization and animation of mathematical functions (MA 401; 28 students) enabled students to perform the many complex computations needed. Results were based on student surveys and on comparison of student performance on Maple-related homework assignments. (Norris)

- Education graduate students in two online courses (ECI 511; 10 students, EAC 595; 13 students) using two-dimensional concept mapping showed a strong preference for mapping assessments over regular exams. In addition, based on survey results, students generally agreed or strongly agreed that concept mapping activities helped them make connections between major topics and sub-topics of the courses. Students’ comments on their post-survey suggested the activities helped them to either piece together and organize course information or to understand how course materials were connected or related (Oliver & Raubenheimer)

- Two web simulations in zoology, “Interactive Pedigrees” and “DNA fingerprints” within a Interactive Biology website were developed to help students model or simulate the complex issues like the inheritance of a genetic disease and DNA banding patterns. Though no formal evaluation on effect on student learning has been completed yet, faculty continue testing with students and feel that the simulation promotes better understanding of underlying concepts and certainly better testing for such understanding. These simulations have also been requested by, and provided to, educators nationwide and in Canada. (Niedzlek-Feaver)

C. Communication/Collaboration Among Peers, Peers and Experts Increased Interaction, Feedback and enhanced Student Learning

Technology was used by students in ways that lead to communication and collaboration with their peers and with experts in their field of learning. Some projects are developing a community of practice to enhance learning. This gives students feedback on their learning and allows them to practice critiquing others.

Examples:

- A Graphic Design portal was set up to supplement graduate and undergraduate courses taught by a College of Design faculty member. This included both general threaded discussions as well as sub-pages for specific courses. Students were actively engaged online through the portal and interacted with others within the NC State design community as well as external audiences including guest critics, design specialists, and alumni in the US and abroad. This provided invaluable feedback, project evaluation and ongoing dialog. Alumni were in touch and shared their first-year experiences, authored threads, and took part in critiques. (Brock)

- Expertiza, a suite of applications for developing reusable learning objects through peer review was evaluated in engineering classes/computer science classes. (CSC/ECE 517, 74 students; ECE 463/521, 30 students; CSC/ECE 506, 16 students). In Expertiza, students submit assignments to the system, which then presents these assignments to other students for review. Both reviewer and author can communicate over a shared Web page, and the author has a chance to submit revised versions in response to reviewer comments. Students reported satisfaction with this tool. They said they learned more from peer review than from lecture. They also felt they learned more from the assignments than they enjoyed them and said that writing for their peers helped them to better understand the concepts in the course. In an earlier study this was also used in courses in other departments. Feedback from faculty and students was used to further refine the system (Gehringer)

- Students in zoology (Evolution, Developmental Anatomy; Histology of the Vertebrates, Principles of Embryonic Development), responding to a Student questionnaire, stated that "active learning, and paired exercises with PDA's enhanced their ability to communicate ideas, share content with other students, and understand concepts." (Black, Niedzlek-Feaver & Brizuela.)

D. Motivation For Learning increased with more technology usage

Some projects showed that students had more motivation to learn when they used the technology. Students were often motivated to start their assignments quicker and to feel more positive about the learning experience.

Examples:

- The study of the Graphic Design portal set up to supplement graduate and undergraduate courses (College of Design) found that students who were actively engaged online through the graphic design portal had a tendency to begin their projects earlier and developed them further (Brock). Similarly, in the Computational Chemistry laboratories (CH230, CH232) the PI observed that "The most interesting observation from the instructor view point was the way in which the students readily started assignments. (Sremaniak)

- The project on Hypertext of Hegel's work (PHI 302) found that interaction with the hypertext gave students a more enjoyable and valuable learning experience than reading a standard hardcopy text. Hardcopy text left many students' questions unanswered and thus led either to frustration or merely misinterpretation of the concept under consideration. Student surveys were used to gather their reflections on the use of the Hypertext. (Bykova)

- Use of electronic hand held responders in 6 undergraduate classes was investigated. (ANS 309, 23 students; ARE 210, 51 students; BIT 360, 18 students; BIT 360, 17 students; ET 252, unreported no. of students). Students in courses with personal response systems (clickers) said that the class was more interesting and they appreciated the fact that their responses were anonymous. They believed the best use of the system was to ask questions throughout the lecture. Data was collected by surveying three to six students in each class, for a total of 28 students in five classes. (Moore)

E. Technology Stimulated Students' Engagement with Learning Material and Once Engaged, Students Learned More

The literature on educational practices suggests that the more "engaged" a student is with their learning, the more they will learn[3]. Many of the LITRE projects enable students to be more engaged. Students took more time on the material when using the technology. In addition, many students reported that the technology had a positive effect on their learning.

Examples:

- In the archaeology courses incorporating hands-on Web-based archives (ANT 495, 12 students; ANT 253: spring, 98 students; summer, 15 students) the students were eager to try and find the variables that would lead them to the correct answer. Many students, although working independently at isolated computer workstations, frequently interacted with each other, trading suggestions and helpful hints, as well as interacting with students other than their classmates. Student surveys showed students were overwhelmingly positive about this module - felt that the technology was appropriate, helpful, and enhanced their knowledge of the software and topic, made material more understandable. (Fitzpatrick)

- The use of a virtual microscopy system, with 20 virtual slides, was investigated in two veterinary courses (VMP, 942;VMP 978, 62 students). Student surveys indicated that 80% of students said that they would spend moderately to significantly more time than they already spend studying slides if virtual slides were available for studying. (Neel)

- Two computational chemistry laboratories were set up (CH230, CH232) online. Based on observations, the PI concluded there was more inquiry-driven learning and students were more engaged with the material and readily started assignments in this electronically delivered lab than in her previous lecture courses. **(**Sremaniak)

- Students working with the Hypertext of Hegel's work (PHI 302) stated hypertext was: "extremely helpful in clarifying Hegel's concepts"; "[T]he links to various terms and concepts allows for easier clarification of points difficult to grasp" Students surveys were used to gather their reflections on the use of the Hypertext. (Bykova).
- Study of the use of CPS technology (Clickers) in an undergraduate psychology class found that surveyed students (N=26) were overwhelmingly positive about the use of this technology. The PI's reported: "statements gathering the strongest agreements were related to students' engagement during the actual class period." (Niefeld and Osborne).

---

[3] Kuh, Kinzie, Cruce, Shoup and Gonyea (2006) Connecting the dots: Multi-faceted Analysis of the relationships between student engagement results from the NSSE and the Institutional Practices and conditions that foster student success; Pascarella and Terenzini (1991), How College Affects Students, etc.

F. Other Benefits of Technology

Easier, Cheaper Access and Exposure to Innovative Technology

Sometimes there is an expectation that there will be no difference in learning with or without technology, but that technology will enable easier, cheaper, and more efficient ways of allowing student learning. For example, one would want students to perform the same in a remotely conducted lab as in a hands-on in-class lab. Additionally, exposure to cutting edge technology allows students to investigate this technology first hand in a controlled campus setting and prepare them to be leaders in their field.

Examples:

- PI's of a project in Civil Engineering (CE 324, 22 students) expected to find no differences in student performance regardless of whether they used a remote lab or hands-on lab. Technology was instead meant to: a) prepare students to be leaders in use of a new technology (Remote monitoring of bridges and buildings to assess structural integrity is being carried out now by some researchers, and in the coming years this technology will make its way into standard civil engineering practice), b) allow students to conduct the experiment individually instead of in teams of 3 and become more familiar with each aspect of the testing procedure, and, c) contribute to students' ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Assessment showed that students in the hands on lab performed better than those in the remote lab on the Final Exam (overall average of 75% vs. 68.3%) Those in remote lab, however, suggested improvements for the remote lab, including improved web access, improved manual and data spreadsheets. (Matzen, Nau & Gupta)

- A social work video of two home visits focusing on safety hazards, along with ancillary teaching materials enabled faculty in social work to create a means to systematically take students through a home visit: preparation for the visit, "walking" through the home, assessing the hazards encountered, and documenting observations, virtually. Taking all students in the class to a home visit would not be possible ethically or logistically. (Ames & Williams)

Efficiency

Examples:

- Several projects discussed technology increased efficiency of class time (Brock; Sremaniak)
- Wireless-laptops and flexible configuration of the lab by using moveable tables allowed for the creation of new learning spaces. Historically, geology laboratory exercises frequently involved water and rocks, which were incompatible with computer use. Classes would meet in the lab and file back and forth to the computer lab as needed. The use of wireless laptops and moveable tables permits diverse laboratory use, allowing for on the fly changes as the students worked with different media. (Thomas)

II. LESSONS LEARNED ABOUT TEACHING WITH TECHNOLOGY

Where as the above section summarizes the reports in terms of student learning, this section summarizes themes about the complimentary side, the effect of technology on teachers and their teaching/pedagogy. Several PI's reflected upon how the use of technology impacted their teaching and preparation for class.

A. Faculty Pedagogical Strategies and Technology Use is Interdependent and Interactive
Many of the faculty indicated that their pedagogy was changed when they used the technology in the classroom or because students were using technology outside of the classroom. Examples:

- The online modules and WebCT discussion and quiz tools created for ENG 332, allowed students to spend class time in a computer classroom practicing writing. In the restructured classroom situation, the students worked on the actual writing of the graded assignments (as opposed to the previous year, when class time was used to present content, and assignments were done later). The faculty gave immediate feedback at the moment of composition, answered questions, guided students to more appropriate composing behaviors, identified where students were having problems, and acted as a "master craftsman" more like in a composition "workshop." (Katz)

- Access to the Internet in zoology courses was useful for increasing active and collaborative learning during class. (However, Palm PDAs were not adequate, the PIs of this grant recommended that low-end laptop computers be used in the future.) The faculty increased the use of active-learning exercises and the students could make concept maps, locate articles and images on the Internet, write essays, and taking on-line quizzes etc., activities that stimulated critical thinking skills and collaborative learning. (Black, Niedzlek-Feaver & Brizuela.)

- The video and ancillary teaching materials developed for the social work course provided a way for students to take part in an active learning situation of going through the various steps comprising a home visit. This could not have been done without this technology and could not easily be conveyed through lecture or written material. (Ames & Williams)

- Two Computational Chemistry laboratories were set up (CH230, CH232) online as inquiry-guided courses. The students were given assignments where it was not immediately obvious what they were going to have to do. They had to figure out how to set up a given calculation to return the necessary results to analyze a particular problem or answer a particular question. This is different pedagogy than the instructors lecture courses. (Sremaniak)

The examples indicate that faculty teaching and learning with technology included attentive consideration of pedagogical and learning principles and as a result the student learning was increased.

B. Functional Aspects of Technology are Important: Infrastructure, Support, Time Investment and Faculty Culture Change.

Infrastructure and Support is Critical
When technology did not function, faculty and students show increased frustrations.

- As WebCT was upgraded to Vista and then to the latest version 4, additional learning was required by faculty to deal with the upgrade. This turned out to be both time-consuming and at times frustrating. (Kramer & Arnold)

- Use of "clickers" had technical difficulty. In many cases getting software installed (due to procedures for installing software in a classroom) was a problem; in others it did not work well with older computers, and equipment had to be upgraded. This led to some faculty dropping out of the study and basic frustrations. (Moore)

- Students using PDAs in zoology classrooms reported technical problems with use of the Palm in class, including ability to read information on the small screens. This lack of functioning tended to discouraged students or facilitated negative attitudes. (Black, Niedzlek-Feaver & Brizuela)

Time Investment and Faculty Culture Change
Many faculty reported that the incorporation of technology/conversion of materials into an online form or creation of technology-based applications was even more time consuming than planned. The LAC committee, in discussing the LITRE projects, concludes that when planning such innovations, time, support and resources need to be adequately allocated. Though no formal study was done on this, teaching and learning in a technology rich environment necessitates a faculty culture change. Investment of time is not static, technology itself changes rapidly, there is a sense of losing autonomy in the classroom, as support for technology set-up and maintenance is usually in the hand of others. Many faculty indicate, in discussions across campus, that time spent on improving instruction and learning new or upgraded technology that will improve learning, is not adequately rewarded.

C. Examples of Effective use of Technology in Teaching

Multimedia content enrichment, visualization tools allows for increased depth of knowledge and greater student learning. These bullets below point out some ***specific*** strategies that PI's indicated worked well in the technology-enriched environments they taught in. They are intended to help others as they design their own learning/teaching environments.

- Insistent **prompts** need to be given **in order to get students to use embedded technology** enrichment material in a course. (Arnold & Kramer)
- **Navigation** within technology based course content is vital and needs to be planned. Students tend to get lost in information. (Bykova -Hypertext, Digital music). Suggestions include using a navigational framework, index. (Brock)
- **Students need orientation to a new technology**. Clear instruction on how to use the technology and what to do when it does not work are recommended. (Arnold & Kramer)
- Students seem to prefer/make more use of more closed/bound/specific objects that open-ended, boundary-less ones. (E.g. WebCT examples vs. Web Searches)
- **Technology can be a motivator** for student learning, positive attitude towards technology, 'fun" aspect. (Fitzpatrick)
- **Technology can foster collaboration, communication and peer learning**.

Students working in pairs on a technological device (palms, (Black, Niedzlek-Feaver & Brizuela.)
Students working on individual computers within a collaborative setting, with instructor waking around encouraging peer interaction and using questions as "teachable moments."
Using the web and blogs to build a "community of practice" with students, alumni, external faculty and students, professionals etc. (Design-Brock). Benefits include using the site for peer assessment and feedback, as a research tool.

- Assessment of student use and learning can be used to get feedback to improve learning modules or learning/teaching technology and pedagogical practices. (Katz, Fitzpatrick, Bykova, Gehringer)
- To build collaborative communities, discussion forums etc. **modeling a "safe and open environment is vital.** "Students who have found that sharing their thoughts comes without penalty or embarrassment are those who maintain and build online community." Integrating online dialog early, not linking participation to grades, and keeping managing faculty engagement online to a minimum have shown to be healthy ways of maintaining the site. Certainly faculty presence online is not excluded …(is) been kept to a minimum as students respond better when faculty comment occurs face to face. (Brock)

III. RECOMMENDATIONS

While reviewing assessment plans in the grant proposals, working with the PIs on the various projects and grants, and reviewing the reports, it became clear to the LAC that the assessment activities varied widely in quality. In some cases the assessment plan was not feasible because it was not planned early enough to implement or required unavailable resources. The project leaders often did not have the time, training, or resources to engage in rigorous assessment. Assessment has been difficult for a variety of reasons, including: 1) some projects were too small to assess learning effectively; 2) parts of the larger projects lacked faculty involvement and an application to a specific learning situation; 3) some projects focused solely on a technical innovation, not on a pedagogical innovation; 4) some assessment plans were difficult to implement within the grant year, and 5) limited resources have been applied to assessment activities. The LAC itself is a group of volunteers who must put other responsibilities first and who do not have the time or the authority to support or require assessment in dozens of projects. Based on these observations the LAC proposes the following recommendations:

1. Develop 3-5 Large LITRE Projects: Based on last year's and this year's findings, we continue to recommend focusing on 3-5 large projects that would be designed during 2006-2007 and implemented during 2007-2009. Hugh Devine, as faculty representative on LITRE Executive Council, would coordinate these projects and Geetanjali Soni and the LITRE Assessment Committee would support the assessment activities of these projects. The first two waves of small, individual grants to faculty helped identify the themes and pedagogical practices documented in this report. They also provided an opportunity to introduce and implement varied technologies in varied settings. However, given the quantity of funds and nature of the projects, in depth assessment of student learning was not always emphasized. Following up these smaller projects by focusing on a few large-scale projects would allow for more in depth and systematic assessment of student learning as well as assessment over a longer period of time. To begin to help focus, we recommend **choosing from the themes** we discuss in this report. Some considerations for criteria for these projects include:

- Have a major focus regarding student learning
- The interrelationship between pedagogy and learning needs to be part of the assessment
- Focus on one of the four outcomes specified in the LITRE plan
- Include faculty from a variety of disciplines
- Use a faculty learning community format to bring a group of faculty working together on each large project
- Use a framework when developing the specific project details
- Based on technology already working, in place.
- Each year, during summer, write report that focuses on impact of student learning

LITRE's fundamental purpose as a systematic investigation is best served by developing these large projects that are faculty driven, focus on specified courses or learning experiences, and include a detailed, staffed, and funded assessment plan from the beginning.

2. Improvement of Assessment Activities: To improve assessment and reporting, the LITRE Assessment Committee should develop a common framework, which allows for flexibility of interpretation and use as well as uniformity for analysis and reporting. This framework would contain an outline (much like a grant proposal does) for PI's to use as a guide in designing their pedagogical and assessment component as well as a tool for organizing and presenting project reports. One starting point for the framework will be the framework developed by Joni Spurlin, Brad Mehlenbacher, Dianne Raubenheimer, Deena Murphy-Medley, and Stan North Martin during 2005-2006. This is important as we define new 3-5 major projects for the next wave of LITRE.

3. Increase Faculty Pedagogical Strategies Repertoire

LITRE projects have shown that when teaching and learning with technology included attentive consideration of pedagogical and learning principles, student learning was increased the most. FCTL and DELTA are both focused on working with faculty related to pedagogical issues. We recommend they continue to work with faculty to build appropriate pedagogical strategies that relate to technology use and to assist faculty reexamine their pedagogy in light of how technology can enhance teaching and learning. It would be beneficial to ongoing LITRE activities, if assessment follow-up of the faculty who use FCTL and LTS services could be reported to LITRE Assessment Committee, periodically.

4. Showcase LITRE Results

Showcasing LITRE results across campus would help both disseminate findings from LITRE projects as well as help build a community of practice. We need to celebrate these projects and grants. We recommend that campus leaders determined how best to share this work across campus. The Technology Practice Directory will also help identify other work that might also be shared across campus.

Appendix A

LITRE Grant Reports Used in this Annual Report

Natalie Ames and Linda William: Using Video to Teach Social Work Assessment and Documentation. (2004-2006).

Betty L Black, Marianne Niedzlek-Feaver and Brenda Brizuela; Increasing Interactivity and Collaborative Learning in the Classroom with Wireless, Handheld Tools. (2004-2006).

Tony Brock: The Digital Design Studio: Multi-modal Collaboration Through the Integration of Online Design Tools. (2004-2006).

Marina Bykov: Hypertexts as Means of Interactive Student-Centered Learning in History of Philosophy Courses. (2004-2006).

Scott Fitzpatrick: Developing ComputerBased Modules for Introductory and Advanced Archaeology Courses. (2004-2006 and 2005-2007).

Ed Gehringer: Disseminating Electronic Peer Review Throughout the University. (2004-2006 and 2005-2007).

Susan Katz: Interactive Online Modules for Writing Instruction. (2004-2006).

Jonathan Kramer and Alison Arnold: Development of a media-rich online course in the Global Approach to Understanding Music. (2004-2006 and 2005-2007).

Vernon Matzen, AbhinavGupata and James Nau: Web Based Observation and Control of an Undergraduate Civil Engineering Laboratory Experiment. (2004-2006).

Gary Moore: Using Handheld Electronic Responders in the Classroom to Provide Immediate Feedback and Enhance Student Learning (2004-2006).

Jennifer Neel, Valarie Pallatto, Carol Grindem and David Bristol: Virtual Microscopy Practical Exam and Survey Results. (2005-2007).

John Neitfeld and Jason Osborne: The impact of CPS technology in monitoring, performance, and pedagogy in educational psychology. (2004-2006).

Marianne Niedzlek-Feaver: Learning by application: Problem-solving web exercises on DNA fingerprinting and Pedigrees. (Two web simulations and a resource web site) (2004-2006).

Larry Norris: Curriculum Enhancement: Incorporation of Technology into MA 401. (2004-2006 and 2005-2007).

Laura Sremania: Computational Chemistry Laboratories I & II. (2004-2006 and 2005-2007).

Carrie Thomas, John Fountain, Donna Wolcott, and Edward Stoddard: Integrating Interactive Learning into the Geosciences.

Joni Spurlin, Dianne Raubenheimer, Stan North Martin, Brad Mehlenbacher, Janet Fortune, Virginia Lee and Lavanya Chintapalli: ClassTech Observation Study Report (2005-2006).

Stan North Martin, Joni Spurlin, Dianne Raubenheimer, Brad Mehlenbacher, and Dickran Paruanak: ClassTech Survey Report (2005-2006)

Strategic Learning Management System Implementation Assessment Committee, DELTA: Learning Management System Usage report (2006)

Other Reports Received But Not Used in This Report, As Assessment Phase is In Progress or to Be Done Later

Lisa Grable, Tom Oppewal & Malina Monaco: Implementing Student Digital Learning Portfolios. (2005-2007).

Helen Kraus and Anne Spafford: Development Of An On-Line Store To Enhance Student Learning In Up To Four Horticulture Courses. (2005-2007).

George Rouskas : Learning with In-class Technology: The 15-Minute Learning Module Approach . (2005-2007).

Kristin Thoney: Department of Textile and Apparel, Technology and Management. (2005-2007).