

**ARIZONA UNIVERSITY SYSTEM
NORTHERN ARIZONA UNIVERSITY
TECHNOLOGY AND RESEARCH INITIATIVE FUND
(TRIF)**

E-Learning:

**The
Information Science/Technology Initiative
at
Northern Arizona University**

BUSINESS PLAN

**Approved by Arizona Board of Regents
December 1, 2005**

Executive Summary

Brawn earns little and brains much. For individuals, here are three words of advice: skills, skills, skills. The economic prospects of those without skills are bleak. What we now see – falling real wages for those without skills – is going to continue.

Lester C. Thurow, **Atlantic Monthly**, June 1999¹

The purpose of the E-Learning initiative is to increase the opportunities for Arizona citizens to participate in, contribute to, and benefit from the “New Economy” of the 21st century that is predominantly knowledge and technology based. The three areas of focus for FY’07-FY’11 will be: 1) expanding access to baccalaureate and post-baccalaureate education for time-bound and place-bound students by supporting new course development for the Arizona Workforce Development (AWD) initiative; 2) raising the quality of all Northern Arizona University academic programs by effective application of Web and other instructional technologies, with a focus on engaging and supporting all Northern Arizona University faculty in employing established and emerging technology principles and practices to promote student success; and 3) infusing appropriate technology skill development into degree and certificate programs for all learners be they online, hybrid, or web enhanced programs. These guiding principles are designed to address two of the “key strategies” found in the Action Plan developed in the *2002 Statewide Economic Study, Arizona’s Education & Workforce Infrastructure* Prepared for the Arizona Department of Commerce by Ronald J. Gunderson, Ph.D., Bureau of Business & Economic Research, Northern Arizona University.

The Action Plan developed in this report calls for significant investment in the State’s higher education system, and proposes three key strategies: (two follow below)

- *Increase Participation.* Raise the rate at which Arizona high school graduates participate in higher education.
- *Increase Capacity and Productivity.* Enhance the salaries of faculty and staff; improve the physical infrastructure, and **expand the technological capacity of institutions of higher education** [bold added]. (Gunderson, p.7)

Specifically, the use of Web and information technology will be integrated into our teaching and learning enterprises, expanding the access students have to knowledge and providing them with technological skills for a lifetime of learning. Graduates will have the skills and the knowledge to meet the needs of Arizona’s current and future employers.

The products of this initiative are Web courses available to on and off campus students, an enhanced liberal studies program with strong technological literacy

¹ As quoted in *The New Economy: A Guide for Arizona*, Morrison Institute, October, 1999.

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outcomes, improved certificates related to information technology, faculty with expertise in teaching with technology, and revised courses and curricula that use information technologies to better educate our Arizona citizens. In addition, our offerings from the college of education in Teaching and Learning, Supervision and Curriculum, and teacher training in the Masters in Education Technology program, all supported by the E-Learning Initiative, address the need for high quality and continuous improvement in K-12 education documented in the Battelle report, Building from a Position of Strength: Arizona Advanced Communications and Information Technology Roadmap, March 2004. Through these programs, emerging knowledge about the effective use of technology to promote student learning is disseminated to teachers throughout the state.

The most important products of this project, though, are the Northern Arizona University graduates. Our graduates will be better-prepared for the workforce because they will have increased access to key academic programs, and upon graduation, will be skilled at technology and prepared for a lifetime of learning via the Web. A technically literate populace and workforce will better understand the advantages and need for the Advanced Communication and Information Technology based economy. As voters and stakeholders, citizens will support industry growth. Potential entrepreneurs, employers, employees, and collaborators will benefit from Northern Arizona University's expanding offerings for core education, technical retraining, and technology enhanced non-scientific endeavors that are enabled by and promote further development of advanced communication technologies. These goals and ideas are identified in the Battelle report Building from a Position of Strength: Arizona Advanced Communications and Information Technology Roadmap (March 2004).

Measurable outcomes of the project include the number of new Web course developed, the number of courses enhanced with information technology, increases in enrollments of students off and on campus, number of faculty and students participating in Web teaching and learning and the number of Northern Arizona University graduates with advanced technological literacy skills. An important outcome is the effective use of new practices using information technologies, informed by cognitive and learning research, that are pervasive throughout the university curriculum. All faculty will use a modest level of technology and the majority will improve quality in delivery of education to our students.

The value of E-Learning, to all education levels and the Arizona workforce in general, is articulated as the targeted outcome of the E-Learning initiative in the [January 2001 APNE report, "An Economy that Works for Everyone": Targeted Outcome](#)

E-Learning becomes pervasive in all segments of Arizona society as a tool for teaching, learning, and conducting business. As a result, E-Learning helps

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Arizona residents and companies become and remain internationally competitive in the new economy. (APNE Report, p. 23)

This business plan demonstrates how the state of Arizona and Northern Arizona University will benefit from direct and indirect returns on investment from the E-Learning initiative. Enrollments will increase at Northern Arizona University as a result of this project. Northern Arizona University graduates will be more qualified for jobs requiring greater technical skills that also pay more. Arizona's K-12 teachers will have an improved level of technological competency, thereby enhancing our students' preparation for college. Most importantly, the quality and quantity of the graduates of our higher educational institutions will be expanded; and these graduates will have the technical skills to substantially increase Arizona's workforce capacity.

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1. Core Vision/Project Description

The New Economy will demand a better match between workplace requirements and the knowledge and skills of higher education graduates. A program must be developed to advance the breadth and depth of technology literacy that employers expect and need.

Arizona at Risk, Report of the Governor's Task force on Higher Education, December 2000.

The purpose of the E-Learning initiative is to cultivate effective use of information technology to support student learning and, ultimately, success in the New Economy. This purpose will be accomplished through: 1) support for development of high quality online learning resources, courses, and programs; and 2) research and assessment of learning, instructional design, and use of technology to enhance student learning and access to knowledge. The initiative will contribute directly to the effort to increase access of time and place-bound Arizona citizens to the highest quality baccalaureate and post-baccalaureate educational programs. It will also increase the facility of Arizona learners with the information technology tools and other skills critical to the new, knowledge-based economy.

By increasing the pervasiveness of E-Learning, this initiative will broaden participation, raise the quality level of available tools, and improve support for using information technology in all areas of student learning at the university or throughout the state, be it in online programs, traditional classroom courses or in other related educational activities such as advising, career counseling, exploring professional portfolios or in using electronic information resources such as those found in the library. Specifically, the use of Web and information technology will be integrated into our teaching and learning enterprise by expanding the access students have to information and by providing them with technological skills for a lifetime of learning. Graduates will gain the skills and the knowledge needed to meet the needs of Arizona's current and future employers.

1.1 Overview of Need

Arizona continues to face significant challenges in assuring that its citizens are educated for the workforce of the 21st century. The Measuring Up State Report Card for Higher Education ranked Arizona poorly by most indicators. Arizona high school graduates' preparation for college dropped from D+ in 2000 to D in 2002 and 2004. In completion of higher education, Arizona ranked 42nd (of 50 states) in 2000, 40th in 2002, and 46th in 2004. In 2002, Arizona ranked 26th in affordability of education; in 2004, Arizona plummeted to 46th. These data show that our students are unprepared for higher education; they are not completing their post-secondary studies; and, their ability to participate in the "new economy" will only be more difficult and costly in the future. Furthermore, the "New Economy Index" ranking for Arizona dropped from 10th in 2000, to 16th in 2002 and 2004. This indicates that education and linked job creation in Arizona is not adequately

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addressing the needs for the globalization and knowledge based principles of the emerging 21st century economy.

These trends need to be reversed for Arizona to compete with other states in the knowledge-based economy. It is therefore critical that we redouble our efforts to infuse technological competency and E-Learning principles into the curriculum at all levels of education. The Report Card states:

Many Arizona students do not complete a high school education within four years. This is a serious concern as the state is experiencing substantial growth in the number and diversity of its high school students. In the past decade, the likelihood of young people and working-age adults enrolling in higher education has declined. The state has lost ground in providing students and families with an affordable higher education, which may undercut state efforts to send clear messages to students about the importance of taking rigorous courses and being prepared academically during high school. (2004 Measuring Up, Strengths and Weakness Synopsis, <http://measuringup.highereducation.org/stateprofilenet.cfm?myYear=2004&stateName=Arizona>)

For those Arizona citizens who have achieved post-secondary degrees, education for a knowledge-based economy does not stop with a post-secondary degree. Rather, it requires a lifetime of learning. Moving Arizona forward in economic development requires the ability for all citizens to continually improve their knowledge and skills. The Arizona Partnership for a New Economy² recommended that the state broaden connections between workers and new sources of knowledge, education, and training. The Governor's Taskforce on Education and the Arizona Partnership for a New Economy underscored the need to better utilize technology to increase access to higher education and to increase knowledge about how to successfully facilitate online learning.

Clearly, Arizona citizens need access to higher education opportunities. These student-citizens, however, also need technology rich environments, with well-designed courses infused with technology, to successfully pursue their advanced education, and training. At the same time, such educational opportunities must be part of a life-long endeavor.

1.2 Mission and Goals

The *E-Learning Center* is a key research and development unit that contributes to curriculum improvement and increased access of Arizona citizens to advanced educational opportunities through the integration of Web and other information technologies into our educational offerings for both residential and non-residential students. This center was originally envisioned and established as the Center for Research, Assessment, and Development of Learning in Electronic Environments (CRADLEE). It will be outlined later in this plan why the various units involved in this initiative including CRADLEE and CTEL, the Center for Technology Enhanced Learning, are to be consolidated and identified under one name and

² As reported by Howard, Catts and DeKok in "Moving ALL of Arizona into the 21st Century Economy", the 78th Arizona Town Hall, a background report prepared by University of Arizona, 2001,

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acronym, the E-Learning Center (ELC). The hallmarks of E-Learning at Northern Arizona University will be engaged, effective, and efficient teaching and learning.

The specific E-Learning Center (ELC) goals are the following:

1. We will increase Northern Arizona University's capacity for successful use of Web courses to serve distance and local students. Consistent with the efforts of the Arizona Board of Regents, Governor, and Legislature to increase access to higher education for Arizona citizens, Northern Arizona University's E-Learning initiatives bring affordable and convenient courses and programs to those who cannot attend classes on campus. Web-based programs and courses allow these Arizona citizens to pursue their Northern Arizona University studies regardless of location.
2. We will use information technology to improve how faculty teach and how students learn. It will not be sufficient to encourage and support the pioneering faculty in using new approaches that integrate technological tools; we must engage a broad range of Northern Arizona University faculty to increase effectiveness in designing students' learning activities in an efficient manner. The poor high school preparation and delayed entry of many of our students calls for adaptive, authentic, and constructivist approaches. Such approaches employ learner-centered principles that acknowledge and address multi-contextual learning styles and motivate our students to succeed. Self-paced tutorials, competency assessments and identification of missing requisite knowledge are examples of learner-centered techniques appropriate for electronically-enhance learning environments.
3. The 21st century economy is not only a knowledge-based but also a technology-driven economy. Our goal is that ALL students who graduate from Northern Arizona University, regardless of their entering preparation, are technically literate and prepared with the technology skills for the workplace and for a lifetime of learning.
4. We will establish Northern Arizona University as a leading institution for utilizing E-Learning to enhance educational quality and access. In the next five years, the previous achievements of the E-Learning initiative will be extended in order to further increase knowledge of effective E-Learning design and practices.

1.3 Products or Services Provided by the Project

The products of this initiative are 1) fully online Web courses available to on and off campus students; 2) hybrid courses that use both the Web and face-to-face as effective complements to deepen learning; 3) an enhanced liberal studies program with strong technological literacy outcomes; 4) faculty expertise in teaching with proven technology; 5) infrastructure for assessment of student learning and quality assurance for online courses and programs; and, 6) revised

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course curricula and degree program designs that utilize information technologies to better educate our Arizona citizens.

The most important outcomes of this project are better prepared and larger numbers of Northern Arizona University graduates. Our students will be better prepared for the workforce because they will have increased access to key academic programs; and, they will be skilled at technology and prepared for a lifetime of learning via the Web as a result of their E-Learning experiences. Larger numbers of Arizona citizens will achieve a college education through programs designed to reduce time and place barriers through the use of appropriate and proven information technologies.

1.4 Positioning

Employers and potential students will recognize Northern Arizona University as a leader in quality education that utilizes Web and information technology while preparing residential and distance students with essential skills for the workplace in our rapidly changing and increasingly technologically-sophisticated world.

1.5 How the initiative will be accomplished

This initiative is meant to transform the capacity, skills, and experience of faculty and students in the effective use of Web and information technologies for teaching and learning. While the project builds on the expertise of the faculty and infrastructure of our statewide programs, it is based centrally in the Office of the Vice-Provost of Undergraduate Studies so that the whole campus benefits from the transformations that result from the initiative. Broad campus participation is assured through incentives to faculty including mini-grants, support programs, and research fellowships. Further, development of joint support efforts and collaboration with other offices and programs across the university will spread best practices throughout the academy.

Our strategies in carrying out the initiative include the following:

- Integrate Web technology into the learning experience at Northern Arizona University to provide enhanced learning opportunities and/or enhanced access to knowledge.
- Assure all Northern Arizona University graduates achieve a fundamental level of technological competency to prepare them for the knowledge-based economy.
- Provide advanced technological skills for Northern Arizona University students through integration of information technologies into courses and through certificate programs available to all students, regardless of major.
- Provide technical support and training for faculty in the integration of technology into the classroom.
- Identify best-practices and experiment with new information technologies related to teaching and learning.

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- Strengthen the assessment of student learning.
- Assess the effectiveness of online courses and programs.

These strategies are further discussed in section 3.1.1.

2. The Market

2.1 Choices Available to Potential Customers

Northern Arizona University students have a breadth of educational choices available to them, ranging from traditional to on-line community colleges, four-year institutions, and post-baccalaureate programs. All higher education students have become consumers who are ready to transfer to new institutions or take on-line courses from any institution that meets their needs. They are concerned about price, quality, and convenience.

The AWD Business Plan identifies the breadth of competitors Northern Arizona University faces for its targeted programmatic offerings. These competitors include University of Phoenix, Rio Salado Community College on-line offerings, and Web delivered academic coursework available from public and private universities across the country. Northern Arizona University, ASU, and UA have the advantage of being recognized in the state for their low cost, high quality academic offerings. Northern Arizona University has the added advantage of its reputation across the state and nation for its distance offerings. Many students elect to pursue a Northern Arizona University on-line degree because of our strong reputation. (See market report included in AWD Business Plan.)

Our traditional residential students also expect and demand on-line offerings to meet their desire for convenience and flexibility. As Northern Arizona University commits to increasing the retention of students on the Mountain Campus, providing effective Web-learning is an essential strategy. An untapped market for Northern Arizona University is the student who has left after completing one year or more of studies. One reason these students leave is because of the relatively high cost of a residential learning experience coupled with lack of good paying jobs in Flagstaff. Such students can be retained at Northern Arizona University if they are provided with convenient access to continuing their education while living at home and working. Retention is also related to academic success in the first year of college. The E-Learning initiative will foster use of technology to enhance lower division courses so as to increase student achievement and progression to a degree.

2.2 Market Size and Trends

The demographic trends in Arizona point to consistent and significant increases in the number of Arizona citizens needing higher education. According to WICHE, Arizona is predicted to have the second highest growth nationally in the number of

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high school graduates between 1995 and 2012. Many of these students will be from first generation higher education families and will reflect a rich and diverse pool of students seeking meaningful work in Arizona.

2.3 Rivals and Competition

Discussed in section 2.1.

2.4 Nature of Students Entering the Program

Entering Northern Arizona University students arrive with variable preparation for learning in traditional as well as technologically-enhanced environments. We recognize the need to serve both the well-prepared high school graduates and students requiring remedial work in basic writing, reading, mathematics, and technology skills. The E-Learning initiative is critical in serving these needs.

This past year, E-Learning has undertaken a research project to characterize Northern Arizona University students' level of technological skills, openness to new paradigms for learning, and expectations of university-level coursework. Survey results from 281 students enrolled in hybrid courses in various disciplines showed that, in general, many students, even entering Freshman, have the most basic technological skills required to participate in partially-online (i.e., hybrid) courses. However, at all academic levels including graduate students, they tend to have traditional ideas about teaching and learning, and therefore may not be prepared to engage in the autonomous learning activities required of online learners. These results indicate that Northern Arizona University students need explanation of and exposure to non-traditional learner-centered techniques along with continued development and improvement of technological skills facilitated by faculty well-trained in integrating technology in their courses.

Hence, this project not only emphasizes the development of basic technological competencies for all Northern Arizona University students, but also the enhancement of faculty skills to effectively teach in electronic environments, and to apply innovative learning paradigms. It is through this model that Northern Arizona University students will have the fundamental information technology skills essential for the workforce and lifelong learning upon graduation.

2.5 Alternatives

NA

2.6 Estimated Sales

NA

3. Operational Strategies

3.1 Development and Production

3.1.1 Development Status

The E-Learning Center is pursuing the following strategies to integrate Web and information technology into our teaching and learning enterprises, expanding the access students have to knowledge, and providing them with technological skills for a lifetime of learning.

Strategy 1: Integrate Web technology into the learning experience at Northern Arizona University to provide enhanced learning opportunities and/or enhanced access to knowledge.

Information technology will be used to transform courses for on campus and off campus students. We are converting approximately 35 traditional courses per semester onto WebCT Vista, an enterprise scale Web course management platform. These fully on-line courses are available to distance students, on campus students and, more often than not, a mixture of both residential and distance students. All students appreciate the convenient access they have to their coursework where they can now study in their own homes or in a local computer lab rather than arrive at a classroom during designated hours.

These Web course students develop capability with an essential skill for our new economy: learning independently using the Web. Web courses are designed to take full advantage of information on the Web, virtual discussion sessions, and advanced media capabilities. We intend to implement synchronous web conferencing tools in our online courses to provide more opportunities for collaboration using related desktop sharing technologies.

Web courses are the linchpin of our TRIF funded Access/Workforce Development Initiative and our distributed learning program. The E-Learning initiative supports the development of all Web courses for distributed learning through its Web-course development laboratory and by assuring that courses that meet the university's liberal studies requirements are available via Web for distance and local students. Most importantly, E-Learning supports research that informs instructional design of online courses. The next phase in the evolution of online educational programming is one in which the efficacy of courses and programs will be enhanced by knowledge obtained from research that identifies the best practices in online education.

Faculty are redesigning their traditional courses to be Web delivered or web enhanced in order to increase access for residential students to course materials and to improve student academic success. One particular focus is on redesigning courses that meet our liberal studies requirements because these courses impact all students on campus and are often the only exposure students have to knowledge outside of their majors. For example, the required liberal studies courses are the only courses our elementary education majors take in science,

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mathematics, and writing. Yet, because of the vastly divergent backgrounds of students taking these courses coupled with high enrollments, traditional courses often have high dropout, withdrawal, and failure rates. Course redesigns have the potential to reduce dropout and failure rates.

The Web and other information technologies offer exciting opportunities to enhance the student experience even in traditional, on-campus teaching. As part of the implementation of WebCT Vista, a course shell will be provided for every section in the schedule of classes each semester. In addition to basic syllabi and information, student-centered learning experiences can be designed to provide supplemental content (either for remedial work or for expanded study), self-paced tutorials, and virtual teaming experiences. The instructor's role goes beyond just providing sources of information to actively facilitating learning.

Two initiatives started during 2004-05 academic year, to be more highly developed in the future, are the *Hybrid Course Projects* and the *Shared Curriculum Projects*. The Hybrid Course Projects allow class meetings to become less frequent in order to support in-depth discussions of course material rather than simply recitations of facts. The Shared Curriculum Projects insure common goals for online resource development within departments. These initiatives have the potential to allow a department to increase student access to unified course and program content while also increasing student learning within these courses. At the same time, these efforts are supported by a variety of student support services at *Northern Arizona University* including a 24x7 help desk, innovative tutoring programs utilizing advanced information technologies and committed advising and support staff capable of helping students negotiate rich online administrative as well as academic services.

Strategy 2: Assure all Northern Arizona University graduates achieve a fundamental level of technological competency to prepare them for the knowledge-based economy.

The best way to assure all graduates meet a baseline level of technological competency is to redefine the learning objectives in our liberal studies requirements. All Northern Arizona University baccalaureate students must meet our liberal studies requirements. Currently, one of nine learning outcomes for our liberal studies program is "using technology to enhance their own learning." Last year, a key academic committee completed work to define this competency more thoroughly to reflect essential technological skills such as email communications, word processing, spreadsheets, presentation software, access of Web-based information, and assessing its authority, chat environments, Web page design, and other skills.

E-Learning is building on this effort by funding specific course redesigns in required and high enrollment courses within liberal studies to guarantee all students are explicitly taught these technological skills. Too often in the past, instructors have assumed that students have equal mastery of these critical

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technology skills. We have, for example, already redesigned our freshman composition course, required by all Northern Arizona University undergraduates, to include an introduction to most of the skills listed above. This material is integrated into the writing component of the course, and then will be reinforced in subsequent courses. We are experimenting with our junior level writing requirement to provide advanced technical skills and to assess students' technological capabilities. Other departments are building on the base skills by introducing discipline specific technologies and skills into their curricula. The E-Learning initiative also supports redesign of key freshman courses that have relatively high rates of poor student performance. The assessment of the strategies piloted through the E-Learning initiative will guide further reforms of undergraduate instruction in traditional classrooms and online course delivery formats.

Strategy 3: Provide advanced technological skills for Northern Arizona University students through integration of information technologies into courses and through certificate programs available to all students, regardless of major.

The typical university structure reinforces the growing divide between technology-literate and technology-challenged students. Students majoring in engineering, business or the sciences are often comfortable and skilled at using computers and the Internet for communications, data acquisition, analysis, and Web collaborations through their coursework and laboratory experiences. However, students in the humanities or fine arts may never have a reason to use computers beyond word processing and email, and do not have the prerequisites to tackle coursework in information technology in order to catch up with their colleagues across campus.

Faculty are integrating workplace information technologies into the curriculum so that our graduates are ready to be productive and effective on the job. For example, the business school has integrated SAP's Enterprise Wide Information System into their undergraduate and graduate curriculum, including a highly popular liberal studies course. They are using CITRIX technology so that students can utilize this expensive and computing-intensive software at any location, whether in their home in Tuba City, in one of many statewide or on-campus computer labs, or in their residence hall.

Strategy 4: Provide technical support and training for faculty in the integration of technology into the classroom.

Integrating technology into the classroom can only be successful in the university if faculty are comfortable, skilled, and supported in the use of these new tools. E-Learning's web course development and technology training lab, is dedicated to faculty development for all aspects of using technology for student learning. This increased competency of our faculty is not only essential for successfully preparing technologically-literate graduates, but also for meeting our commitment to delivering specific programs to statewide students via the Web. E-Learning

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staff work very closely with the Access/Workforce Development TRIF project in preparing faculty for Web course development and delivery.

Northern Arizona University has extensive experience with putting courses and degree programs on the Web. As of Spring 2005, Northern Arizona University offers 29 online undergraduate and graduate degree programs, and a number of certificates and endorsements. In the past, the faculty would drop off their course notes and the technical staff would do the work transforming these notes and ideas into a Web course. This approach has not been conducive to generating and sustaining high numbers of Web courses, or assuring that faculty are engaged in developing their own relevant technological skills. With the E-Learning initiative, we have transitioned to educating faculty about WebCT and principles of online learning so that they are empowered to create, modify, and maintain the courses as needed. We now have a full six month process in which a faculty member takes intensive "just-in-time" training (both face-to-face and online), then works with an instructional designer to design the course, and has E-Learning staff consultation assistance for organization, technology, and media as the faculty member completes the course. Our goal to infuse technology across the institution mandates this triangulated approach of education, training, and consultation.

A key to maintaining quality instruction, even given high-quality materials, is to expand E-Learning's services to support faculty and their teaching assistants while a course is being offered. Focused training courses on advanced WebCT features will be available in multiple formats; and assistance in modifying and updating the courses will be available on a drop-in basis. Faculty support will also include assistance with other information technologies that faculty want to incorporate into their courses such as synchronous conferencing, WebCams, digital white boards, discussion environments, animations, digital video production, digitizing media, and other Web technologies. A new program under development is a *Student Technology Assistance Program* with a defined goal to provide technical assistance for faculty from a motivated and highly trained group of student assistants.

Strategy 5: Identify best-practices and experiment with new information technologies related to teaching and learning.

There is no advantage in each faculty member reinventing the wheel, thus we want Northern Arizona University faculty to share with one another and learn from other institutions about best-practices using information technology to enhance learning. Two important initiatives to continue and enhance these activities are the *E-Faculty Fellows Program*, and the *E-Faculty Mentor Program*. The *E-Faculty Fellows Program* is directed at research, development, and dissemination of effective E-Learning practices. The *E-Faculty Mentor Program* supports faculty in sharing strategies and successful practices in a frequent, local, and sustained manner.

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As in any new business venture, Northern Arizona University is continually evaluating and assessing its progress. Important questions, such as the following, are currently under consideration:

- What is the best way to efficiently and cost-effectively teach high-enrollment Web courses that are effective and of high quality?
- What are the best ways for Web courses to utilize student teams effectively within the virtual environment?
- What is the best design for on-campus students to learn in electronically enhanced courses?
- Do pedagogical techniques, such as requiring one or more physical meetings of all distance and local students in a Web course, make significant difference in student learning or success rate?
- What technological tools enable the rich interactions to occur between faculty and students virtually?
- How can new “virtual environments” create an engaging learning experience for students?
- How can technology be utilized to enhance student engagement and learning in high enrollment lower division courses?

E-Learning will continue to research these questions and more, and share what is learned with the faculty at Northern Arizona University and throughout the State of Arizona. The large number of web-based courses that have been created through the E-Learning initiative present an opportunity for a systematic study of online instructional design practices, which would provide a foundation for identification of guidelines for effective web-course development and further assessment research.

Strategy 6: Assess the effectiveness of gains in students' access to learning and in students' technological skills as a result of this initiative.

To maintain the highest standards of academic quality and rigor, our Web programs and courses will be continually assessed, evaluated, and modified to meet the needs of our students' learning. Consistent application of our recently developed *Online Course Evaluation* Instrument will provide a mechanism for identifying course development areas that need improvement. Baseline and performance data will be tracked regarding student enrollments and student success rates in Web versus traditional academic offerings. Efficiency factors, such as student retention and passing rates, will be tracked as well as the number of new Web courses, the number of courses enhanced with information technology, and the number of faculty participating in Web-based teaching and learning activities. Other specific outcome measures can be found in section 4.1.

Student learning outcomes associated with the Web-based academic offerings will be systematically assessed and compared with both internal and national benchmarks such as the National Survey of Student Engagement (NSSE) instrument. We will compare and contrast student learning via Web learning environments with graduates of our traditional offerings. Northern Arizona University is uniquely positioned to address these issues because our programs

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are offered in teaching venues ranging from traditional faculty on campus to off-site instructors in classrooms to Interactive Instructional Television courses to Web enhanced courses, to pure Web courses.

3.1.2 Production process

The following activities are, or will, occur specifically through the use of the E-Learning funds.

Creation and Continuous Improvement of Web Courses

AWD and E-Learning provide \$5000 stipends to faculty redesigning a pre-existing traditional course onto the WebCT VISTA platform. (The stipend is equal to approximately 3 to 4 weeks of faculty summer salary.) These faculty work closely with technical E-Learning staff (described below) during the six month period prior to offering the course to off-campus and/or on-campus students solely via the Web. DLS and E-Learning provide funds for teaching assistants if enrollments in WebCT courses exceed 25.

In order to ensure continuous improvement of web-based courses and programs, faculty also receive support for the re-design of existing web-based courses. Courses require on-going re-design in order to accommodate developments in disciplines and professions. Increasing knowledge about the most effective instructional design practices also informs the revision of existing courses by faculty. The migration to an upgraded course management system will present an opportunity to support course redesigns on a widespread basis. Stipends and technological support for redesign of web-based courses will be matched to the degree of revisions that are determined to be required for a particular course.

Course and Curricular Redesigns

E-Learning provides innovation funds to faculty who intend to integrate technology into their courses. The Request for Proposals (RFP), issued twice per year, typically offers \$10K to \$20K to enable innovative integration of information technology into a course or program. Past examples include the redesign of English composition to incorporate email skills, chat rooms, electronic portfolios, and word-processing. This change alone impacted 2000 students per year starting in Fall '02. Priorities for funding are for liberal studies courses, high-enrollment courses, high-failure rate courses, or major-required courses. Funds are usually for one year to cover faculty and graduate student salaries, and modest equipment and supplies. Project participants work closely with E-Learning technical and assessment staff.

Review General Education Objectives

In Spring 2004, a faculty committee produced a recommendation that identified baseline technical proficiency goals for all students at Northern Arizona University. A next step is to incorporate these goals in a meaningful and comprehensive manner in the Liberal Studies curriculum. E-Learning will consult with faculty as they review the learning outcomes for Northern Arizona University's general education (liberal studies) program in relation to technology

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skills. Some departments and professional programs have gone beyond the basic skill development as recommended by the committee and incorporated higher level technical skill requirements as informed by their profession. These models will be championed by E-Learning for future developments throughout the university.

Best Practices Lab

Currently under design is a multi-year, \$150,000 initiative to create a Best Practices Lab where faculty and technical staff evaluate new technologies to recommend to the campus that represent best practices in utilization of information technologies in the classroom. Existing software and hardware technologies will be studied, allowing us to benchmark our practices with those occurring at other universities. E-Faculty Fellows and other faculty, work in teams with technical staff to test specific methods, assess their success rates in pilot studies at Northern Arizona University or on other campuses, determine their actual vs. perceived costs, and study faculty/student responses.

The results of this best practices lab will guide and focus E-Learning Innovation funds. To disseminate effective practices, E-Learning works closely with the Office of Faculty Development, the Office of Academic Assessment, and the Library to offer panels, workshops, and seminars to campus and distance faculty. Standards of quality will be identified, allowing Northern Arizona University to strategically implement information technology innovations in a sustainable, effective, and cost-efficient manner.

E-Learning Faculty Support

Within E-Learning consists of a team of technical experts that work closely with faculty in the development of Web courses and the integration of information technologies into face-to-face courses. We have a total of 15 staff members and 10 student workers. Much of this support existed prior to TRIF funds but in a diminished capacity. We are in the process of transitioning from operating a “craft” shop with extensive one-on-one consulting to an efficient streamlined operation where cohorts of up to 50 faculty are supported simultaneously in course development.

Three times per year faculty may request support for the following semester to develop their Web course in preparation for implementation in the subsequent semester. Faculty may request \$5,000 stipends from either the Access/Workforce Development initiative, if the course fits their programmatic needs, or E-Learning, if the course meets the criteria of increasing technological literacy in liberal studies or high enrollment courses. Some faculty make use of the support team without receiving a stipend. Requests for support are prioritized based on AWD or E-Learning criteria, on potential enrollments, and on the departmental/college commitment to sustaining the course. We typically have 75 requests for online course development per semester, but can only support approximately 35 courses. However, as support shifts toward developing self-sufficient faculty, and

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with the implementation of Vista, we should be able to support a much larger number of course projects.

E-Learning is expanding its services in response to faculty demand for technical support beyond the training and development period of creating a WebCT course, and beyond purely online courses. A staff person plus a team of student workers will begin providing drop-in technical support to enable faculty to successfully modify and upgrade WebCT courses during and after the semester the course is offered. In addition, the Faculty Support Unit will assist faculty with other technical needs, including training in the use of fundamental information technologies such as Web programming tools, chat rooms, multimedia, synchronous conferencing tools, digital white boards, and WebCams.

Assessment

The E-Learning Assessment Specialist develops and conducts research projects involving the assessment of electronically-enhanced courses in collaboration with faculty. The impact of electronic enhancements on student learning and teaching methods is evaluated through multiple indicators such as class observations, student questionnaires, comparisons of test score data, and interviews with faculty and graduate teaching assistants. The Assessment Specialist works with faculty teams to develop assessment plans for their E-Learning supported projects, such as the Hybrid Course Projects and the Shared Curriculum Projects.

Specifically, the following assessment activities are underway for this academic year:

- Characterizing hybrid-course students for level of technological skills, openness to new paradigms for learning and expectations of university-level coursework.
- Working directly with faculty implementing large-scale course redesign (such as SOC 101, CHE 151, and ECO 284) to design assessment instruments that will evaluate and contrast the technological and learning outcomes of students in these modified courses with traditional versions of the courses.
- Selecting one to three Access/Workforce Development programs as test-cases for evaluating learning outcomes of a full academic program, contrasting a traditional on-campus cohort with a distance, Web delivered program.
- Partnering with the E-Faculty Fellows in developing evaluation benchmarks and methods for identifying best-practices in the use of technology in teaching and learning.

The Assessment Specialist also develops and conducts faculty development workshops on assessment and E-Learning issues, often in partnership with the Office of Academic Assessment. These workshops have been steadily and increasingly attended by faculty and staff from across the University. The Assessment Specialist delivered eight workshops to faculty at Northern Arizona University during the 2004-2005 academic year.

Dissemination

The E-Learning initiative must have a broad impact across the campus and the state, and that only occurs if we communicate our lessons learned and articulate recommendations to faculty in all disciplines at Northern Arizona University, and at ASU and UA. E-Learning's communication projects will include the following:

- the E-Learning Newsletter, published annually describes projects, innovations, and best practices;
- the E-Learning Faculty Showcase at Northern Arizona University is held each semester, where funded faculty will present their project results;
- the Annual E-Learning Institute, where local and national experts will present seminars and workshops on effective practices for teaching and learning with technology (faculty from ASU and UA will be invited to participate); and
- Faculty and E-Learning staff will present seminars and workshops on effective practices in colleges/departments at Northern Arizona University, at national conferences, and at ASU and UA campuses.

The costs for the newsletter, seminars and workshops should be modest at approximately \$40,000 per year.

3.1.3 Cost of development

Each Web course costs approximately \$12,000 to develop, based on the total investment of the AWD and E-Learning funds divided by the number of Web courses developed annually. If each Web course results in the enrollment or retention of 8 additional students, our costs for Web course development will break even. This assumes an approximate revenue stream of \$1500 per student per course, and a 90% to 10% mix of in-state to out-of-state tuition, with 22:1 revenues for in-state students. These costs are well below other education web venues such as E-College or the University of Phoenix.

3.1.4 Labor requirement

Labor requirements to implement the E-Learning project include faculty participants, leadership, administrative and technical staff, teaching assistants, and student workers. RFPs and personal solicitations are used regularly to inform all Northern Arizona University faculty of the opportunities available through E-Learning.

We are particularly lucky that Flagstaff attracts many highly skilled workers who desire living in this location. We have a strong cohort of experienced technical staff with a relatively low rate of turnover. We find our student technical staff to be particularly delightful because these hardworking (and very low cost) workers are extremely bright and capable, have flexible schedules to work with faculty, enjoy

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and learn a tremendous amount of technical knowledge and, upon graduation, find excellent high-paying positions.

3.1.5 Expenses and capital requirements.

The nominal annual funding for E-Learning is \$2.25 million per year. Expenses to implement the project are distributed as follows:

- Innovation Funds (project funds directly to faculty): 25%
- Best Practices (salaries/ERE): 8%
- CTEL (salaries/ERE): 32%
- Assessment (salaries/ERE): 9%
- Administration (salaries/ERE): 10%
- Operations: (supplies, equipment, travel): 11%
- Web-course teaching Assistants: 5%

Technology costs vary between \$75,000 and \$100,000 per year and are included as equipment in the Operations category above. These technology costs are primarily related to computer workstations, multimedia support equipment (scanners, digitizers, projection systems), and newer information technologies such as white boards, web-cams, etc. Some software licensing fees are also accrued. Most of the technology costs associated with this project are borne by the academic units, by Distance Learning in statewide labs, and by Information Technology Services (ITS.) They provide the student computer labs, help desk, fees for campus licenses for software such as WebCT, internet access, and other technology infrastructure components.

3.2 Marketing and Promotion

Higher education is a highly competitive market-place, as was discussed in section 2 above. We have two targeted markets for this project. One is the distant student, often an older student, seeking to complete a baccalaureate degree—especially in workforce areas of engineering, education, business, and health professions. The second market is the incoming freshman seeking a high quality education at a technologically sophisticated residential campus.

Our Distance Learning unit handles the marketing of the distance delivered programs and courses, and the Business Plan for Access/Workforce Development provides details for these plans. The section below will focus on our marketing for new freshmen. (Note that another market for our Web courses is our current Mountain Campus students. However, our Web courses are so popular with residential students that we do not need a marketing plan for that group.)

3.2.1 Strategy

Northern Arizona University is revamping its marketing and recruitment efforts for freshmen, and the access students have to Web delivered coursework will be featured in these efforts. We will market Northern Arizona University to students who are seeking a high quality education at a technologically sophisticated residential campus.

In addition, access to Web versions of our freshman courses will be used as “samples of Northern Arizona University education” for students unsure or unable to arrive on campus. At the same time, Web friendly environments are under development to support students from the time they apply to Northern Arizona University through their graduation and eventual alumni relationship with Northern Arizona University.

3.2.2 Method of promotion

Methods of promotion include regional recruiters who meet directly with high school students or international students, recruiting materials, and Web pages. These efforts will be augmented by focused web marketing efforts resulting in a redesign and renewed focus on Northern Arizona University’s main home page.

3.2.3 Advertising and promotion plans

Northern Arizona University’s embracing of technology in improving access to learning is a central initiative on the campus, and as such, our president is conveying this message to the campus and community through his speeches, written materials, and priority setting. Through this level of support, the campus is redefining its identity, thereby making all advertising and promotion of this project integrated into our campus’ new development of its identity, marketing and visual communication materials.

We are working with Northern Arizona University’s Enrollment Management division in this process to assure our new freshman recruiting materials include highlights emphasizing our Web learning opportunities. We will highlight our Web and advanced technological learning opportunities at our training workshops for recruiters, in our brochures, on the new Web recruiting sites under development this year, and other marketing efforts.

Increasingly, Northern Arizona University recognizes that internal marketing is necessary to help students continually learn about new offerings in our evolving E-Learning environments. To this end, we will work with the campus in making highly visible our Web offerings through the new Northern Arizona University portal, articles in the campus faculty and student newspapers, and at freshman orientation. These efforts complement and extend the reach of this business plan for E-Learning initiatives.

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Furthermore, the transfer of the operation of Arizona Regents' University (ARU) to Northern Arizona University will strengthen the advertising and promotion of online courses and programs to Arizona learners. E-Learning will collaborate with the Vice-President for Extended Programs and Dean of Distance Learning to support and promote the Arizona Regents University mission.

3.3 Project Management

3.3.1 Description of the Organization

As part of the 2002 E-Learning Business Plan, the Center for Research, Assessment and Development of Learning in Electronic Environments (CRADLEE) was created. CRADLEE reports to the Vice Provost for Undergraduate Studies. An E-Learning Director is responsible for the Center, supervises the faculty support unit called the Center for Technology Enhanced Learning (CTEL), and is responsible for disbursement of innovation funds, implementation of best-practices research, tracking performance of all projects, and disseminating results. The Director works very closely with the Office of Academic Assessment, which also reports to the Vice Provost for Undergraduate Studies, to assure E-Learning projects are assessed as needed and those results fed back in to the broader university assessment efforts. Given the huge ramifications of this project for the campus, the Director also works closely with all other organizations responsible for technological learning and teaching. These include our Statewide Programs and the Arizona Workforce Development Initiative, Faculty Development, the Library, Information Technology Services, and the academic program faculty. One staff member, the E-Learning Assessment Specialist, is fully dedicated to supporting assessment of E-Learning projects.

The evolution of the E-Learning initiative and the operations of the functional units responsible for its implementation warranted reconsideration of the current organizational structure. It was determined that the focus, operations and identity (internal and external) of the initiative would be strengthened by restructuring the organization into a single entity with the designation of the E-Learning Center (ELC). This reorganization was approved by the Arizona Board of Regents in August 2005. The name change brings the formal identity in line with how the unit and initiative are recognized by internal and external audiences. This new name and the visible organizational structure has been used throughout this document.

3.3.2 Advisory board or other oversight

Two advisory boards are in the process of being implemented. The E-Learning Internal Advisory Board will consist of NAU administrative and faculty leaders who have a vested interest in the success of this initiative. An External Advisory Board shall be formed, composed of three members, who are leaders in the field of E-Learning or with a strong business background and knowledgeable of the characteristics and requirements for success of graduates in the "innovation

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economy.” This Board will provide guidance and a national perspective on the state-of-the-art of teaching and learning using technology.

The Internal Advisory Board membership shall include the E-Learning Director, the Director of Faculty Development, six Faculty (one from each college), two students, and representative from each of the following: Faculty Senate, Cline Library, Council of Deans, Council of Chairs, Distance Learning, Information Technology Services, and the Provosts Academic Computing Advisory Committee.

The subgroup of six college faculty representatives from the Internal Advisory Board will be recommending standards for Web course offerings, selecting courses for redesign, reviewing and recommending grants during the RFP process, and providing other advisory input in curricular matters.

The E-Learning director and staff will work very closely with committees on campus related to curricular and assessment issues, including the Liberal Studies Committee, the University Curriculum Committee, the University Assessment Committee, the Provost’s Academic Computing Advisory Committee, the Chairs and Deans Councils, and the Faculty Senate.

3.3.3 Support services required

For this project to be successful and assure sustainable results, it relies on the information technology infrastructure already in place at Northern Arizona University. This includes student access to computers, a fully staffed help desk, a modern information-age library, advanced internet and networking capability on campus and at statewide sites, license for WebCT or other course management system, and staff available in ITS, the library, and the Academic Assessment Office. In addition, the project relies on academic departments to provide all maintenance, facilities and departmental computer lab costs.

3.4 Risks and Plans to Overcome Risks

3.4.1 Legal risks and means to minimize them

Pirating of Web site content is a possibility. We have minimized this risk by requiring password access to all WebCT courses and only registered students have access to the password. The university has drafted a “Mediated Copyright and Teach Act Compliance Policy” to ensure compliance with federal copyright laws.

We also follow ABOR intellectual property rules and guidelines regarding course content ownership and rights of use. This means that Northern Arizona University can continue to use locally developed courses even if a particular faculty member leaves Arizona.

3.4.2 Regulatory problems and how to address them

The Arizona Board of Regents restricts Northern Arizona University's ability to offer lower division face-to-face and hybrid Web courses in the Phoenix and Tucson areas except where it is not duplicative of existing community college courses. This restriction limits the ability to provide access to hybrid lower division courses. For example, a Northern Arizona University instructor cannot travel to Phoenix to provide face-to-face supplemental instruction to students in a Web course. This potentially constrains our ability to serve the market for workforce development programs in these metropolitan areas with the full range of instructional strategies. Recent research suggests, for some populations, that a mixed approach, utilizing online and face-to-face interactions, improves learning outcomes over either approach alone. President Haeger is working with the presidents of the other two Arizona universities and the Regents to address this issue.

3.4.3 Political risks and how to ameliorate them

N/A

3.4.4 Business risks (supply and demand)

Supply and demand of new students (supply) and for hiring graduates (demand) is always a factor within higher education. The trend in Arizona of decreasing numbers of students attending a university and the risk of few good jobs being available without a college degree are serious issues that Arizona faces right now. Northern Arizona University is particularly sensitive to decreasing enrollments and a sluggish economy. However, we feel this project will allow Northern Arizona University to contribute to state efforts in overcoming these risks.

Trends indicate that it is the adult student market and the savvy results-oriented students that are increasing on university campuses. The E-Learning initiative is directly aimed at serving these students who want and expect a relevant, convenient, and up-to-date education. Hence, this project will attract and respond to a student market that is on the rise.

The demand for hiring graduates is directly related to the economy. Northern Arizona University has a reputation for strong success in placing our graduates in the workforce. Employers cite Northern Arizona University students' strong and relevant education along with their high work ethic as important factors in their hiring decisions. The E-Learning initiative will increase the demand for Northern Arizona University graduates by potential employers.

3.4.5 Competitive risks

Universities offering individual Web courses for non-degree seeking students are a potential competitive risk for Northern Arizona University. However, a Northern Arizona University student can take a Web course from any accredited institution

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and transfer that course to meet their Northern Arizona University degree requirements. In addition, our approach to addressing this risk is to 1) assure students have access to all courses offered at Northern Arizona University to reduce motivation of our students to take courses elsewhere, and 2) increase the number of Web courses offered to meet that demand by our own students. In fact, this competitive risk also presents an opportunity. By increasing the ease with which non-degree-seeking students can enroll and access Northern Arizona University Web courses, students at other institutions may begin to seek out Northern Arizona University online courses to meet their educational needs at another institution.

Competition in offering full distance-delivered programs is addressed in the Access/Workforce Development business plan.

3.4.6 Cultural risks

Systemic changes in an educational institution, such as this E-Learning initiative, run the risk of resistance by the faculty. While some faculty resist change on principle, most faculty resist change because they don't feel enabled to participate and succeed in the new directions.

A major, even critical, emphasis of this project is to provide faculty technical support in learning Web technology, in developing the courses, and in offering and maintaining the courses. But deeper than that, faculty are receiving support in identifying best ways to use the technology to be successful in their teaching enterprise and are given institutional support in assessing the students' learning.

Through emphasizing the support of the essential needs of the faculty, we are confident that faculty resistance will be minimized. In fact, as our recent WebCT upgrade project demonstrates, demand from faculty for these services has never been higher.

3.4.7 Technology risks

Universities face constant risks associated with making commitments to technologies that may change faster than we can respond. Course management systems are rapidly changing and licensing costs are rising. The best Web course platform this past year (WebCT) may not be the best platform next year, and the technical and faculty costs of transitioning Web courses to a new platform only increase as the number of Web courses increases.

Our Information Technology Services (ITS) and E-Learning are staying informed and active nationally in identifying trends, monitoring other campus' experiences and recommending to our campus the best choices available each year. The three universities are beginning to collaborate on all information technology decisions, potentially resulting in improved negotiation strength for better licensing rates. At the same time, faculty are buffered from a sea of continual change through the coordinated efforts of the E-Learning Faculty Support Unit.

3.5 Sustainability

Web courses are here to stay. Demand from distance and residential students for Web courses will only increase with time, and faculty will continue to embrace the exciting potential for learning in this new medium.

Expanding our Web offerings while sustaining our existing Web offerings will continue to be costly. Increased demands coupled with innovations in pedagogical uses of Web and information technology in the classroom will continue to pressure the campus faculty to develop new and improved Web offerings. Changes in course management systems and Web technology (see section 3.4.7) will mean that faculty will require training and technical support in modifying or translating Web courses into the latest course-management system or Web tools.

A mechanism for producing a revenue stream for Web technology support is essential, yet problematic. The Distance Learning department is currently restructuring to become a self-supporting unit and they will be able to directly support their required services from E-Learning. However, much of the E-Learning initiative supports residential students where the revenue stream from enrollment increases due to this project is less easily quantified and is pooled in the general fund. Hence, in the future some commitment from the institution will need to be made to support this project from general funds.

The research and development component of this project (the best practices lab) has excellent potential for external grant and corporate support equal to its current funding of \$175,000. Innovations in learning techniques and technologies are highly fundable and may result in spin-off enterprises.

3.5.1 Anticipated Funding Sources for Ongoing Support

n/a

3.5.2 Timeline for Transitioning Away from TRIF Support

n/a

4. Goals/Metrics/Outcomes

4.1 Specific and realistic goals:

4.1: E-Learning Specific Goals/Metrics/Outcomes	FY 07	FY 08	FY 09	FY 10	FY 11
Goal 1: Web & Hybrid & Web enhanced courses					
a. Number of new Web courses developed and offered	100	95	90	85	80
b. Number of new Hybrid courses developed (ratio of current total Hybrid to all courses offered will be reported)	15	25	35	45	55
c. Number of new IT-enhanced courses developed (ratio of current total Enhanced to all courses offered will be reported)	20	25	30	35	40
d. Number of course redesigns (ratio of current total Redesign to all courses offered will be reported)	15	20	25	30	35
Goal 2: Participation in Web courses					
a. Number of faculty participating in Web development	200	225	250	300	350
b. Number of student enrollments in online courses	12,000	13,000	14,000	15,000	16,000
c. Number student enrollments in hybrid courses	1,000	1,300	1,600	2,000	2,500
d. Number student enrollments in enhanced courses	2,000	3,000	4,000	5,000	6,000
Goal 3: Increases in student success and satisfaction					
a. Increase in student academic success in Web courses.	5%	5%	5%	5%	5%
b. Increase in student success in enhanced & redesigned courses	5%	5%	5%	5%	5%
c. Percentage of students satisfied with Web learning opportunities	80%	85%	88%	91%	94%
Goal 4: Increase in student technical literacy					
a. Number of graduates with technical literacy skills (to be assessed directly)	2,100	2,200	2,300	2,400	2,500
b. Number of graduates with advanced technical literacy skills (senior survey data)	1,000	1,200	1,500	1,600	1,700

4.1.1 Return on investment

The state of Arizona and Northern Arizona University will benefit from direct and indirect returns on investment from the E-Learning initiative.

- Enrollments will increase at Northern Arizona University as a result of this project. New distance students will have access to our workforce development programs, increased enrollments of freshman will occur because of the increased value-added by our technology-based education, and retention rates will increase on the mountain campus because of the convenience, access and improved learning associated with Web and Hybrid courses for residential students. We anticipate a 2% increase in enrollments due to this project. Assuming a 90:10 ratio of in-state to out-of-state students, that results in an increased revenue of \$1.9 million to the university.
- Northern Arizona University graduates will be more qualified for jobs requiring greater technical skills that also pay more. We estimate the starting salary of our graduates should be approximately \$5,000 per year higher than otherwise. (This, of course, varies by discipline.) Higher salaries translate to higher consumer spending and higher tax revenues.
- Northern Arizona University provides the majority of Arizona's K-12 teachers. These teachers will have an improved level of technological competency, thereby integrating those skills into our elementary and secondary education classrooms. This will lead to improvements in Arizona's national rankings for K-12 quality and provide Arizona with entering college freshmen who are better prepared to study in technology rich higher education settings.
- By improving the quality of the graduates of our higher educational institutions, Arizona's workforce capacity will be significantly improved and the state should attract more high-tech employers that generate high-tech career paths.
- Grants, donations and contracts that build upon innovations supported through E-Learning initiatives.
- Cost savings resulting from increased student success and reductions in DFW rates for courses.

4.1.1 ROI: GOAL Also include matching or in-kind. Allocate multi-year awards over award term.	FY 07	FY 08	FY 09	FY 10	FY 11
1. Federal funds awarded	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
2. State funds awarded	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
3. Corporate funds awarded	0	0	0	0	\$25,000
4. Private funds awarded	0	0	\$25,000	\$25,000	\$25,000

4.1.2 Technology transfer

It is possible that innovations from the Best Practices Lab will result in spin-off enterprises that market products to educational organizations. The majority of these efforts, however, will be freely shared and disseminated throughout Arizona's higher education communities.

4.1.3 Companies relocating

One of the results of this project will be a better-prepared workforce both through completion of targeted programs and through an increased level of technological competency of all of our graduates. This should increase the attractiveness of Arizona to companies seeking to relocate, but this impact cannot be quantified at this time.

4.1.4 Work force contributions

Northern Arizona University's programs support non-traditional students seeking career advancement through higher education. The E-Learning initiative builds on these successes and stabilizes our offerings to ensure continual and sustained improvements in Arizona's work force. Within four years, all of our 2500 annual baccalaureate recipients will have enhanced technological skills as a result of the integration of technology across the curriculum and a sharpened focus on student learning of technological skills.

4.1.5 Specific curriculum innovations

The E-Learning initiative will promote changes in the design of major and general education curricula with the development and wider application of technological enhancements to undergraduate courses. We expect the majority of courses to adopt some information technology component providing students with a range of student-centered E-Learning experiences at Northern Arizona University.

4.1.6 Partnerships/collaborations

At this point in time, our partnerships and collaborations are primarily internal to Northern Arizona University, including the academic units and the distributed learning program (especially the Access/Workforce Development TRIF project.) E-Learning is an integral component in any future tri-University or Arizona Regents' University related initiatives.

Our efforts support faculty developing and assessing Web offerings associated with the Arizona University Network and the Learner Centered Education projects, both ABOR TRIF projects.

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We anticipate external partnerships as we develop our Best Practices Lab. Software companies and for profit corporations are likely partners as we develop new technologies that can serve higher education and corporate training needs simultaneously.

4.2 Timeline for achievement of goals

The timeline for achievement of goals is implied in the table in section 4.1.

4.3 Early proof of performance

4.3.1 Implementation goals for first three years

Currently Northern Arizona University is implementing a major upgrade to our course management system, WebCT. This enterprise level system, Vista, will allow some important goals to be met over the next two to three years. These goals are 1) examine and revise our current stock of online courses as reviewed through the lens of our recently developed Online Course Quality Indicator instrument, 2) provide a comprehensive set of training modules for faculty, 3) provide faculty development in effective online pedagogy by engaging the faculty, while migrating their courses to the new system, in our recently developed Instructional Design Course (ID 101), and 4) provide a WebCT Vista shell for every course offered at Northern Arizona University. These steps, especially #4, will further our core mission of increasing quality and engaging all faculty in using modest, but important technological components in their teaching.

4.3.2 Special efforts to produce rapid results

Four strategies will be employed to achieve these results rapidly: 1) E-Faculty fellows will research and assemble a body of work on effective practices and principles for technology enhanced learning, 2) E-Faculty Mentors working within the framework of the Best Practices Lab and supported by Student Technology Assistants will disseminate effective practices on a departmental basis, 3) emerging technologies currently in the pilot phase such as class response systems and synchronous web conferencing tools will be evaluated and applied to programs to enhance student success, and 4) all projects and programs will have an assessment component supported by the E-Learning Assessment staff to reflect on the results in our effort for continuous improvement.

5. Pro Forma Financials

METRICS	FY 07 Proj	FY 08 Proj	FY 09 Proj	FY 10 Proj	FY 11 Proj
<u>Work force Contributions</u>					
Number of new Web courses developed and offered	100	95	90	85	80
Number of new Hybrid courses developed	15	25	35	45	55
Number of new IT – enhanced courses developed	20	25	30	35	40
Number of courses redesigns	15	20	25	30	35
Number of new faculty participating in Web development	200	225	250	300	350
Number of new student enrollments in online courses	12,500	12,750	13,000	13,500	14,000
Increase in distance student enrollments in online courses	150	175	200	300	300
Increase in residential student enrollments in online courses	350	75	50	200	200
Number of student enrollments in hybrid courses	1,000	1,300	1,600	2,000	2,500
Number student enrollments in enhanced courses	2,000	3,000	4,000	5,000	6,000
Increase student academic success in Web courses	5%	5%	5%	5%	5%
Increase in student success in enhanced & redesigned courses	5%	5%	5%	5%	5%
Percentage of students satisfied with Web learning	91%	92%	93%	94%	95%
Number of graduates with technical literacy skills	2,000	2,050	2,100	2,150	2,200
Number of graduates w/advanced technical literacy skills	1,000	1,200	1,500	1,600	1,700
Number graduate students in internship programs	0	1	1	1	1
Number undergraduate students in internship programs	1	2	2	2	2
<u>Partnerships</u>					
Number of private sector partnerships	1	1	1	1	1
Number of scholarly publications/conference presentations	3	5	7	10	10