**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

**September, 2002**
**Revised December, 2002**

# 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 1999[1]

The purpose of the e-Learning initiative is to expand access of Arizona citizens to baccalaureate and post-baccalaureate education for time-bound and place-bound students. 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 goals of this project are to increase NAUs capacity for successful use of Web courses to serve distance and local students, use information technology to improve how we teach and how students learn, and to assure all NAU graduates are technically literate and are prepared with the technology skills for the workplace and for a lifetime of learning.

The products of this initiative are Web courses available to on and off campus students; an enhanced liberal studies program with strong technological literacy outcomes; new certificates related to information technology; faculty with expertise in teaching with technology, and revised courses and curricula that utilize IT to better educate our Arizona citizens.

The most important products of this project, though, are the NAU graduates. These people 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.

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, the number of NAU graduates with advanced technological literacy skills, external financial support for research in IT learning, and the number of private sector partnerships in this project.

Northern Arizona University and the state of Arizona will benefit from direct and indirect returns on investment from the E-Learning initiative. Enrollments will increase at NAU as a result of this project. NAU graduates will be more qualified for jobs requiring greater technical skills that also pay more. Arizona's K-12 teachers will have an

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

improved level of technological competency, thereby enhancing our students' preparation for college. And the quality of the graduates of our higher educational institutions will be expanded to include technical skills that will 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 expand access of Arizona citizens to baccalaureate and post-baccalaureate education for time-bound and place-bound students. 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.

## 1.1 Very brief overview of the industry

Arizona faces significant challenges in assuring its citizens are educated for the workforce of the 21st century. According to Measuring Up 2000, Arizona high school graduates have a D+ preparation for their college education. Arizona is ranked 42nd out of 50 states for completion of higher education, and the affordability of our education is ranked 31st out of 50. Our students are not only unprepared for higher education, but they aren't completing their post-secondary studies.

Education of our citizenry for a knowledge-based economy does not stop with a post-secondary degree. Rather, it requires a lifetime of learning. The Arizona Partnership for a New Economy[2] recommended that moving Arizona forward in economic development requires the ability for all citizens to continually improve their knowledge and skills and the state must broaden connections of workers to new sources of knowledge, education and training. The Governor's Taskforce on Education and the Arizona Partnership for a New Economy identified specific areas of demonstrated workforce need, including primary and secondary education, engineering and information technology, health professions and business.

It is clear that Arizona citizens need access to higher education opportunities, and need the preparation and technical skills to successfully complete their advanced education and training.

## 1.2 Mission and goals

The Center for Research, Assessment, and Development of Learning in Electronic Environments (CRADLEE) has been created to increase the access of Arizona citizens to advanced knowledge through the integration of Web and other information

[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,

technology into our educational offerings for both residential and non-residential students.

Our specific goals are to

1. We will increase NAUs capacity for successful use of Web courses to serve distance and local students. Many Arizona citizens cannot afford to attend a residential campus, often dropping out to return home and work, consistent with our state's low ratings in affordability and completion rates of higher education. Web-based programs and courses allow Arizona citizens to pursue their NAU studies regardless of location.
2. We will use information technology to improve how we teach and students learn to compensate for poor high school preparation, for alternative learning styles, and for limited access to high-demand courses. Self-paced tutorials, competency assessments, and identification of missing requisite knowledge are just examples of learner-centered opportunities that information technology allows.
3. The 21st century is not only a knowledge-based economy, but also a technological-based economy. Our goal is that ALL students who graduate from NAU, regardless of their entering preparation, are technically literate and are prepared with the technology skills for the workplace and for a lifetime of learning.
4. We will establish NAU as a premier institution for utilizing e-learning to enhance educational quality and access.

Our strategies are to:

- Support NAU's Proposition 301 Access/Workforce Development (AWD) program by developing Web courses and other information technology tools to increase student access to targeted baccalaureate and post-baccalaureate degree programs;
- Redesigning courses to be Web offered to increase access of residential and non-residential students to coursework, emphasizing access to courses that meet the university graduation requirements called liberal studies courses;
- Integrating Web and other IT tools into traditional courses to enhance student learning and technological skills;
- Redefining the learning expectations of our liberal studies requirements[3] to assure all NAU graduates have the fundamental technical skills to be prepared for the workforce and for a lifetime of learning;
- Increasing certificates in advanced information technology skills accessible by students of any major;
- Providing technical support and training for faculty in the integration of technology into the classroom;
- Identifying best-practices and experiment with new information technologies related to teaching and learning; and

[3] Liberal studies requirements are the common course requirements for all undergraduate students that must be completed in order to receive a baccalaureate degree. Some campuses call these common requirements the "general education" program.

- Assessing the effectiveness of gains in student access to learning and technological skills as a result of this initiative.

### 1.3 Products or services provided by the project

The products of this initiative are Web courses available to on and off campus students; an enhanced liberal studies program with strong technological literacy outcomes; new certificates related to information technology; faculty expertise in teaching with technology, and revised courses and curricula that utilize IT to better educate our Arizona citizens.

The most important products of this project, though, are the NAU graduates. These people 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.

### 1.4 Positioning

NAU wants employers and potential students to recognize NAU as a leader in offering a quality education that utilizes Web and information technology as it prepares residential and distance students with essential skills for the workplace in this rapidly changing, technological 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 associated with our statewide programs, it is based centrally in the Office of the Vice-Provost of Undergraduate Studies so that the whole campus embraces, benefits and transforms as a result of the initiative. Through incentives to faculty, including mini-grants, support units and research fellowships, broad campus participation is assured.

## 2 The Market

### 2.1 Choices available to potential customers

NAU students, our customers, 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, 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 NAU faces for its targeted programmatic offerings. These competitors include Rio Salado Community College on-line offerings, University of Phoenix, and Web delivered academic coursework available from public and private universities across the country. NAU, along with ASU and UA, have the advantage of being recognized in the state for their low cost, high quality academic offerings. NAU has the added advantage of its reputation across the state and nation for its distance offerings. Many students select to pursue an NAU on-line

degree because of its 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 NAU changes to increase the retention of students on the mountain campus, providing effective Web-learning is essential. This is especially true for the NAU 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. These people can be retained as NAU students, with convenient access to continuing their NAU education while living at home and working.

### 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 percentage increase in the number of high school graduates between 1995 and 2012.

### 2.3 Rivals and competition

Discussed in section 2.1.

### 2.4 Nature of students entering the program

Our students are the "raw material" supplied to our institutions with variable preparation. NAU struggles frequently in trying to serve both the well-prepared high school graduates along with those requiring remedial work in basic skills such as writing and reading and mathematics.

Our students arrive with an even greater variation in their technology skills. Some students arrive on campus ready to teach our best technical staff a few IT tricks. However, most of our students come from first generation college households or poor rural communities where they have never used a personal computer. They don't know how to turn on a computer, much less how to use email or how to write a paper or develop a presentation on the computer. Databases, web searches and computer programming are beyond their conception.

Hence, a major emphasis of this project is to assure all NAU students have the basic technological competencies to use and access a Web course along with other fundamental information technology skills essential for the workforce.

### 2.5 Alternatives

NA

### 2.6 Estimated sales

NA

# 3 Operational Strategies

## 3.1 Development and Production

### 3.1.1 Development status

The Center for Research, Assessment, and Development of Learning in Electronic Environments 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.

- Integrate Web technology into the learning experience at NAU 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 50 traditional courses per semester onto Web CT, a 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 become capable at 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.

Web courses are the linchpin of our Proposition 301 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 Development Laboratory, CTEL, and by assuring coursework that meets the university's liberal studies requirements are available via Web for distance and local students.

Faculty are redesigning traditional courses to be Web offered to increase access of residential students to coursework and/or to improve student academic success. We are focusing on redesigning courses the meet our liberal studies requirements. These courses impact all students on campus and are often the only exposure students have to knowledge outside of their major. For example, the liberal studies requirements are the only courses our elementary education majors take in science, mathematics, and writing. Yet because of the broad set of students taking these courses and their high enrollments, they often have high drop, withdraw and failure rates.

The Web and information technology offers exciting opportunities to enhance student success in traditional, on-campus teaching. For example, learner-centered learning experiences can be provided such as supplemental content (either for remedial work or for expanded study), self-paced tutorials, and virtual teaming experiences. The instructor's role is transforming from the source of information to a facilitator of learning.

Class time can become less frequent, and/or can be committed to discussions of course material rather than simply recitations of facts. These changes have the potential to allow a department to increase student access to courses while also increasing student learning within these courses.

- Assure all NAU graduates achieve a fundamental level of technological competency to prepare them for the knowledge-based economy.

The best way to assure all NAU graduates meet a baseline level of technological competency is to redefine the learning objectives in our general education requirements at NAU known as the liberal studies program. All NAU baccalaureate students must meet our liberal studies requirements. Currently, one of nine learning outcomes for our liberal studies program is "using technology." We are defining this competency more thoroughly to reflect essential technological skills such as email communications, word processing, spreadsheets, presentation software, Web access of information and assessing its authority, chat environments, Web page design, and other skills.

We are funding specific course redesigns in required and high enrollment courses within liberal studies to guarantee all students are taught these technological skills, rather than simply expected to have them. For example, we have already redesigned our freshman composition course, required by all NAU undergraduates, to include an introduction to all of the concepts 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.

Our students are using technology throughout their education in developing their electronic portfolio: a digital repository for samples of their best work that they can use for evidence to employers of their skills and educational products. The electronic portfolio also benefits the institution as we assess samples of student work to assure our students meet our stated learning outcomes.

We are also considering non-traditional modes to teaching and assessing baseline technical skills. Students, especially transfer students, will be able to take competency assessments on the Web to see if they meet our baseline criteria. If not, self-paced or in-person courses can be available to them to acquire the skills needed to meet NAU's requirements.

- Provide advanced technological skills for NAU students through integration of IT tools into courses and through certificate programs available to all students, regardless of major;

The typical university structure reinforces the divide growing between techno-literate and techno-feeble 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 by virtue of 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 don't have the prerequisites to tackle coursework in information technology to catch up with their colleagues across campus.

We are developing certificates to be sure all students can access advanced IT tools in their education. A certificate has already been designed specifically for the high-tech economy in networking by the College of Business Administration. We are working with multiple colleges to create a certificate in "information technology" accessible by all majors. Coursework will assume no background in computing and will teach students advanced skills in computing, Web utilization, and data access and manipulation where applications range from business to library sciences to education.

Faculty are integrating workplace IT tools 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 at any location, whether their home in Tuba City or their residence hall, can utilize this expensive and computing-intensive software from their local personal computer.

- Provide technical support and training for faculty in the integration of technology into the classroom.

IT can only be successful in the university if faculty are comfortable, skilled and supported in the use of these new tools. CTEL, our Web development lab, is dedicated to helping our faculty develop WebCT courses, supporting faculty while these courses are offered and providing training and support for utilization of other IT educational tools in teaching. 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. We work very closely with the Arizona Workforce Development Proposition 301 project in preparing faculty for Web course development and delivery.

NAU has experimented with putting courses on the Web for years. 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 is not a viable approach to generating and sustaining high numbers of Web courses. With the E-Learning initiative, we have transitioned to educating faculty about Web CT so that they are empowered to create, modify and maintain the courses as they need to. We now have a full three month process in which a faculty member takes an intensive one week training class, works with an instructional designer to design the course, and has a CTEL staff partner who provides assistance as the faculty member completes the course. The large number of Web courses that can be developed in one year, increasing from approximately 30 to 150, indicates the success of this approach.

Our next step is to expand CTEL's services to offer faculty support after the course is developed. Brief training courses on advanced WebCT features will be available, and

help modifying and updating the courses will be available on a drop-in basis. Faculty support will also include assistance with other IT tools that faculty want to incorporate into their courses such as Web Cams, digital white boards, discussion environments, animations, digitizing media and other Web tools separate from Web CT.

- Identify best-practices and experiment with new technologies related to teaching and learning with information technology.

There is no advantage in each faculty member reinventing the wheel, and so we want NAU faculty to share with one another and learn from other institutions about best-practices using information technology to enhance learning. Important questions need to be addressed such as:

- What is the best way to teach high-enrollment Web courses efficiently and cost-effectively?
- 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 Web-augmented courses?
- Is Web CT the best platform for Web course management?
- 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 student virtually?
- How can new "virtual environments" create a simulated learning experience for students?

The Center for Research, Development and Assessment of Electronic Learning Environments will research these questions and more, and share what they have learned with the faculty at NAU and elsewhere.

- Assess the effectiveness of gains in student access and learning 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. 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.

Student learning outcomes associated with the Web-based academic offerings will be systematically assessed and compared with both internal and national standards such as the NSSE (National Survey of Student Engagement) instrument. We will compare and contrast student learning in the Web learning environment with graduates of our traditional offerings. NAU is uniquely positioned to address these issues because our programs are offered in teaching venues ranging from traditional faculty on campus, off-site instructors in classrooms, Interactive Instructional Television courses, pure Web courses and Web enhanced courses.

### 3.1.2 **Production process**

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

Creation of Web Courses

The Center provides $5000 stipends to faculty who convert a pre-existing course onto the WebCT platform. (The stipend is equal to approximately 3 to 4 weeks of faculty summer salary.) These faculty work closely with technical staff of CTEL (described below), during the semester prior to offering the course to off-campus and/or on-campus students solely via the Web. The Center provides modest funds for teaching assistants if enrollments of on-campus students in Web-CT courses exceed 35.

Course and Curricular Redesigns

The Center provides innovation funds to faculty who intend to integrate technology into their courses. The RFP is issued twice per year, offering typically $20K to $50K to enable innovative integration of IT into a course. Examples include the redesign of English composition to incorporate email skills, chat rooms, electronic portfolios and word-processing. This change alone will impact 2500 students per year starting 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 and cover faculty and graduate student salaries and modest equipment and supplies. Faculty work closely with CTEL staff (described below) for technical support.

Review General Education Objectives

A faculty committee will be formed this fall semester to identify baseline educational expectations for all students at NAU. Technological literacy standards have been developed by the European Union and professional organizations. This committee will develop a standard for NAU that is appropriate to the needs of Arizona workforce through gathering input from faculty, alumni, professional organizations and Arizona businesses and other employers.

Best Practices Lab

This year we are implementing a multi-year, $150,000 initiative to create a Best Practices Lab where faculty and technical staff evaluate and recommend to the campus techniques and technologies that represent best practices in utilization of IT in the classroom. Existing software and hardware tools will be studied, allowing us to benchmark our practices with those occurring at other universities. A Faculty Fellows program, in which a small team of faculty work with a technical staff team to test specific methods, assess their success rates in pilot studies at NAU 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. We will work closely with the Office of Faculty Development to offer panels, workshops and seminars to campus faculty to convey our results. Standards of quality practice will be identified, allowing NAU to strategically implement IT innovations in a sustainable, effective and cost-efficient manner.

CTEL

CTEL consists of a team of technical experts that work closely with faculty in the development of Web courses and integration of IT into courses. We have a total of 15 staff members and 10 student workers. CTEL existed prior to Prop 301 funds but in a diminished capacity. CTEL, as stated above, has transitioned 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 CTEL support for the following semester to develop the Web course in preparation for offering the subsequent semester. Faculty may request $5,000 stipends from either the Arizona 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 also use CTEL support without receiving a stipend. Requests for CTEL 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 65 requests for course development per semester, and can only support approximately 50 courses.

CTEL's Faculty Support Unit

CTEL is expanding its services in response to faculty demand for technical support beyond the training and development period of creating a Web CT course. 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 they offer the courses. In addition, the Faculty Support Unit will assist faculty with other technical needs, including training in the use of fundamental IT skills such as Web programming tools, chat rooms, multimedia and other Web basics. In addition, they will become familiar with new technologies that faculty may want to utilize, such as digital white boards or WebCams.

Assessment

Half of the staff of the Office of Academic Assessment is dedicated to assessing the quality of learning our on and off-campus students experience in electronic environments. Specifically, the following assessment activities are underway for this academic year:

- Establishing standards of student learning objectives associated with Web courses and technological literacy. Appropriate instruments will be developed, such as the UCAR and NSSE, that allow comparison with state and national standards.
- Working directly with faculty implementing large-scale course redesign (such as ENG 105, BIO 100, SOC 312) 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 Faculty Fellows in developing evaluation standards and methods for identifying best-practices in the use of technology in teaching and learning.

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 recommendations to faculty in all disciplines at NAU and at ASU and UA. Communication projects will include:

- E-Learning Newsletter: published annually that describes projects, innovations and best practices.
- Annual May E-Learning Workshop at NAU where all funded faculty will present their results, and faculty from ASU/UA will be invited to participate.
- Faculty and E-Learning staff will present seminars in colleges/departments at NAU and visit ASU and UA campuses and present seminars on results.

The costs for the newsletter, seminars and workshops should be modest, and approximately $25,000 per year.

### 3.1.3 Cost of development

Each Web course costs approximately $9,500 to develop, based on the total investment of the E-Learning grant 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 $1200 per student per course, assuming an 80% to 20% mix of in-state to out-of-state tuition and 22:1 revenues for in-state students.

### 3.1.4 Labor requirement

Labor requirements to implement the E-Learning project include faculty participants, technical staff, and student workers. RFPs and personal solicitations are used regularly to inform all NAU 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 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 $1.4 million per year. Expenses to implement the project are distributed as follows:

Innovation Funds (project funds directly to faculty): 25%
Best Practices (salaries/ERE): 12%
CTEL (salaries/ERE): 35%

Assessment (salaries/ERE): 8%
Administration (salaries/ERE): 12%
Operations: (supplies, equipment, travel): 9%

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 IT tools such as white boards, web-cams, etc. Some software licensing fees are also accrued. Most of the technology costs associated with this project are bourn by the academic units, statewide and by Information Technology Services (ITS.) They provide the student computer labs, fees for campus licenses for software such as Web CT, 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 seeking to complete a baccalaureate degree, especially in workforce areas of engineering, education, business and health professions. The second market is incoming freshman that are seeking a high quality education at a technologically sophisticated residential campus.

Our NAU Distributed 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 freshman. (Note that another market for our Web courses are our current NAU students. However, our Web courses are so popular with residential students that we do need a marketing plan for that group.)

#### 3.2.1 Strategy

NAU is revamping its marketing and recruitment efforts for freshman, and the access students have to Web delivered coursework will be central to these efforts. We will market NAU 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 NAU education” for students unsure or unable to arrive on campus. For example, international students are taking our freshman colloquium via the Web while they wait for their VISAs to be processed.

#### 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.

#### 3.2.3 Advertising and promotion plans

NAU’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 materials and images.

We are working with the newly created Enrollment Management unit 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 pieces.

We will work with the campus as well in making highly visible our Web offerings through the new NAU portal, articles in the campus faculty and student newspapers, and at freshman orientation.

## 3.3 Project Management

### 3.3.1 Description of the organization

The Center for Research, Assessment and Development of Learning in Electronic Environments reports to the Vice Provost for Undergraduate Studies. An E-Learning Director is responsible for the Center, and supervises 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. Given the huge ramifications of this project on the campus, the Director is expected to work closely with all other organizations responsible for technological learning and teaching. These include our Statewide Programs and the Arizona Workforce Development Initiative, Faculty Development, Information Technology Services, and the academic program faculty.

In order to optimize our assessment activities, E-Learning assessment has been integrated into NAU's Office of Academic Assessment. The three staff in the office are supported by a combination of state, Prop 301 and local funds to enable comprehensive assessment activities at NAU. One staff member, the E-Learning Assessment Specialist, is fully dedicated to supporting E-Learning initiative project assessment. We chose to integrate assessment of E-Learning into the primary assessment activities on campus to assure the results are fed back into institutional decision-making at the highest level.

### 3.3.2 Advisory board or other oversight, if appropriate

Three internal advisory boards are in the process of being implemented. The E-Learning Coordinating Committee will consist of administrative and faculty leaders on the campus who have a vested interest in the success and implementation of this initiative. These include the E-Learning Director, Vice Provost for Undergraduate Studies, Vice President for Information Technology, Dean of Distributed Learning, CTEL

Director, the Director of Faculty Development, Faculty Senate representative, Library and a representative from both the Council of Deans and Chairs.

The E-Learning Faculty Committee is an advisory body specifically responsible for recommending baseline learning outcomes associated with technology in the liberal studies program, addressing standards for Web course offerings, selecting courses for redesign during the RFP process, and providing other advisory input in curricular matters.

The Assessment Advisory Committee is a group of stakeholders on campus concerned with effective assessment efforts. This group consists of the Director of Academic Assessment, the E-Learning Asessment Specialist, the Dean of Distributed Learning, the Associate Vice President for Planning and Institutional Research, the Vice Provost for Undergraduate Studies, the Vice Provost for Graduate Studies, and the Associate VP for Student Affairs.

The Center Director and staff will work very closely with other committees on campus related to curricular and assessment issues, including the Liberal Studies Committee, the University Curriculum Committee, the Chairs and Deans Councils and the Faculty Senate.

The ABOR's Business Advisory Team will also provide an important source of advice and guidance. The Business Advisory Team's involvement with both the Prop 301 funding projects and the general education requirements in the Arizona universities can provide invaluable support to this project. For example, the Business Advisory Team can assist us as we define the appropriate skills, knowledge and abilities essential for an effective workforce, and provide guidance for gathering employer data regarding our graduates' effectiveness in the workplace.

#### 3.3.3 Support services required

For this project to be successful and with sustainable results, it relies on the information technology infrastructure already in place at NAU. This includes student access to computers, advanced internet and networking capability on campus and at statewide sites, license for Web CT or other course management system, and staff available in ITS 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 Web CT courses, and only registered students have access to the password.

### 3.4.2 Regulatory problems and how to address them

The Arizona Board of Regents restricts NAU's ability to offer face-to-face and hybrid Web courses in the Phoenix and Tucson areas, outside of a few special programs. So, for example, an NAU 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 huge market for workforce development programs in these metropolitan areas.

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 risk of decreasing numbers of students attending a university, and the risk of few jobs being available after graduation are serious issues that NAU faces right now: decreasing enrollments and a sluggish economy. However, we feel this project will allow NAU to overcome 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 retain just the student market that is on the rise.

The demand for hiring graduates is directly related to the economy. NAU has a reputation for strong success in placing our graduates in positions because of their strong education and high work ethic. The E-Learning initiative will increase the demand of NAU graduates by potential employers.

### 3.4.5 Competitive risks

Universities offering individual Web courses for non-degree seeking students are a significant competitive risk NAU. An NAU student can take a Web course from any accredited institution and transfer that course to meet their NAU degree requirements. Our approach to addressing this risk is to 1) assure students have access to all courses offered at NAU 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 addition, this competitive risk also presents an opportunity. NAU is increasing the ease by which non-degree-seeking students can enroll and access our Web 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 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 utilize the technology to be successful in their teaching enterprise along with support in assessing the students' learning as a result of this effort.

Through emphasizing the support of the essential needs of the faculty, we are confident that faculty resistance will be minimized.

### 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 (Web CT) 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 CTEL are staying informed and active nationally in identifying trends, monitoring other campus' experiences and recommending to the 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.

## 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.

However, 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 IT 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 Distributed Learning department is currently restructuring to become a self-supporting unit, and they will be able to directly support their required services from CTEL. 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, 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.

## 4 Goals/Metrics/Outcomes

### 4.1 Specific and realistic goals

Measurable goals of this project include:

| | FY 02 | FY 03 | FY 04 | FY 05 | FY 06 |
|---|---|---|---|---|---|
| | | | | | |
| Number of new Web courses developed and offered | 117 | 150 | 130 | 120 | 100 |
| | | | | | |
| Number of new IT-enhanced courses developed | 10 | 20 | 30 | 40 | 50 |
| | | | | | |
| Increase in enrollments of distance students in Web courses | * | 500 | 600 | 700 | 800 |
| | | | | | |
| Increase in residential undergraduate enrollments | * | 100 | 150 | 200 | 250 |
| | | | | | |
| Increase in student academic success in Web courses. | * | 10% | 15% | 20% | 30% |
| | | | | | |
| Total number of faculty participating in Web development | 93 | 150 | 200 | 250 | 300 |
| | | | | | |
| Number of NAU students taking Web courses | 3300 | 4000 | 4500 | 5000 | 5500 |
| | | | | | |
| Number of graduates with technical literacy skills | * | 1750 | 2000 | 2250 | 2500 |
| *(to be assessed directly)* | | | | | |
| Percentage of students satisfied with Web learning opportunities | 75% | 80% | 85% | 90% | 95% |
| *(senior survey data)* | | | | | |
| Number of new certificates in advanced technology for students | 1 | 1 | 1 | 0 | 0 |
| | | | | | |
| Grants and donations for research in best-practices | $40,000 | $50,000 | $100,000 | $100,000 | $150,000 |
| | | | | | |
| Number of private sector partnerships | 0 | 1 | 2 | 2 | 2 |
| | | | | | |
| Number of spin-off companies | 0 | 0 | 0 | 1 | 1 |

* data not measured during FY 02

### 4.1.1 Return on investment

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

- Enrollments will increase at NAU 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 courses for residential students. We anticipate a 2% increase in enrollments due to this project. Assuming an 80:20 ratio of in-state to out-of-state students, that results in an increased revenue of $1.9 million to the university.
- NAU 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.
- NAU 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.
- 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, and generate, more high-tech employers.

### 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.

### 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

We anticipate impacting over 2000 new or advanced-trained workers with the Access/Workforce Development initiative (see AWD Business Plan.) In addition to improving the education of these distance students, within four years all of our 2500 annual baccalaureate recipients will have enhanced technological skills because of changes in the liberal studies requirements.

### 4.1.5 Specific curriculum innovations

We anticipate a total of three new certificate programs related to advanced information technology skills as a result of this initiative.

### 4.1.6 Partnerships/collaborations

At this point in time, our partnerships and collaborations are primarily internal to NAU, including the academic units and the distributed learning program (especially the Arizona Workforce Development Prop 301 project.)

Our efforts support faculty developing and assessing Web offerings associated with the Arizona Regents University and the Learner Centered Education projects, both ABOR Prop 301 projects.

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 included in the table in section 4.1.

# 5 Pro Forma Financials

| | *FY 2002* | *FY 2002* | *FY 2003* | *FY 2004* | *FY 2005* | *FY 2006* |
|---|---|---|---|---|---|---|
| | *REV BUDGET* | *ACTUAL* | *BUDGET* | *BUDGET* | *BUDGET* | *BUDGET* |
| | | | | | | |
| **REVENUE** | **$ 1,400,000** | **$ 1,353,800** | **$ 1,887,315** | **$ 1,780,000** | **$ 2,250,000** | **$ 2,300,000** |
| | | | | | | |
| **EXPENDITURES** | | | | | | |
| OPERATING BUDGET | | | | | | |
| Personal Services | $ 526,000 | $ 477,175 | $ 1,471,735 | $ 1,300,000 | $ 1,600,000 | $ 1,632,000 |
| ERE | $ 102,600 | $ 108,730 | $ 231,669 | $ 300,000 | $ 375,000 | $ 383,000 |
| All Other Operating | $ 771,400 | $ 90,580 | $ 183,911 | $ 180,000 | $ 275,000 | $ 285,000 |
| **TOTAL OPERATING BUDGET** | **$ 1,400,000** | **$ 676,485** | **$ 1,887,315** | **$ 1,780,000** | **$ 2,250,000** | **$ 2,300,000** |
| | | | | | | |
| CAPITAL BUDGET | | | | | | |
| Building Renovation | | | | | | |
| Debt Service | | | | | | |
| **TOTAL CAPITAL BUDGET** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| | | | | | | |
| **EXPENDITURES GRAND TOTAL** | **$ 1,400,000** | **676,485** | **$ 1,887,315** | **$ 1,780,000** | **$ 2,250,000** | **$ 2,300,000** |