

Redesigning Arizona's Universities: Assessing Options for Arizona's Educational Futures

January 2005

**Faculty Stakeholder Group
Arizona University System Redesign Study**

This report has a number of footnotes for specific statements in the text. In addition, there are references listed for general reading. Example scenarios for the future of higher education are included.

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Executive Summary

The Arizona University System Redesign Project is an opportunity to identify our university-level educational approach for the 21st century. The Redesign Project could make changes that will last a long time and require significant resource expenditures; it will need to be compatible with the groups that interact with universities and to also address a broad range of issues facing higher education in Arizona and elsewhere.

This report reviews some of the expected and possibly unexpected changes that might occur in the next 15-20 years that would impact our educational design choices today. It raises concerns about the existing preliminary needs assessment and the approach taken by the initial redesign proposal. It also reviews a series of Arizona-specific studies that are related to higher education, summarizes the national discussions on the future of universities, identifies some key characteristics of the university of the future, and lists several scenarios for possible higher education futures. The most significant changes affecting higher education are demographic, financial, technological, and the role of higher education in society. Some possible changes are near certainties, other possibilities are quite uncertain.

Several technology events have changed the way we provide learning, with two as primary: 1) the use of the internet by large numbers of people (beginning about 1993 with the world wide web), and 2) individual communication through devices such as cell phones, e-mail, and walkman/iPod units. This makes vast amounts of information easily and freely available to everyone. These changes can be labeled as “connectivity” – either technical or social (new social networks form through the available technologies). Thus, students (and others) can connect with essentially anyone, anyplace, anytime, nearly cost free. *This changes the way students and others assimilate information and learn and how they respond in a university environment.* The in-coming students grew up in this environment. The educational methods in most universities do not take full advantage of the many combinations of technology and the changed student.

In the demographic and financial areas we are experiencing a number of trends that will continue but with more uncertainty. The percentage of Hispanics in the college-age population is growing rapidly and Arizona is second in population growth rate in the country; however, Arizona ranks low on many social and educational quality indicators. Access to higher education (through high school preparation, financial ability, and physical location) will become a more important factor in the future. The relative proportion of university budgets from state appropriation is declining (it is also declining in other states) and the proportion of the Arizona state higher education appropriation per \$1,000 personal income has declined since 1974. This has forced the universities to seek other funding sources to augment their budgets. This shift in budget sources also has raised issues in higher education about the degree of privatization and its effect on the “public university.”

Fortunately, there are a number of studies about the future of higher education that can assist us in better understanding how education might change in the next 15 years, the time frame of the Redesign Project. These include: professional futurists, past university presidents (who offer suggestions for navigating a different future), State of Arizona or its contractors, a unique citizen’s group (the Arizona Town Hall), and the Arizona Board of Regents. All of these studies make conclusions and recommendations about how the educational needs of Arizona may change.

This report also catalogs some changes made in the last few years by the universities, the Arizona Board of Regents and the State of Arizona in response to a few of the anticipated changes. Some responses are internally focused and some address the growing demographic, economic, or technical changes. While Arizona lacks a state-wide strategic vision for higher education, the universities have all acted to address emerging needs as they occur; continuing this process allows for significant additional growth.

The Arizona Board of Regents is faced with several objectives – providing an excellent education to qualified students at a reasonable cost, addressing the state’s growing and diverse population of potential students and others, enhancing the stature of the three universities, and participating in and encouraging state economic growth through research results and an educated workforce and informed citizenry.

There is no simple formula for addressing all these objectives. Estimating costs of education is difficult but possible, but the many other factors in the decision are not easily quantified. An understanding of all these factors can be addressed by

building scenarios – where the different possibilities are woven together in different ways, as a series of stories, to get a feeling for how the various issues interact and to move thinking to the larger picture of higher education. We have developed one scenario (as an example) for Arizona, and included several higher education scenarios developed by others.

There are two critical points that are missing from the discussions to date: 1) we are designing a new university system from the perspective of the past, as modified only by increasing numbers of students and the cost of instruction, rather than understanding the fundamental changes that could occur in higher education, and 2) we have no central strategic framework for higher education in Arizona on which to base redesign choices. We therefore believe a major re-focusing of the project into two critical areas is desirable: 1) to address future-oriented questions and the resulting discussion, considering the previous Arizona and national studies; and 2) to designate learning as the central focus, by creating a learner-centered environment and taking advantage of the new technologies and collaborations. We already know some traditional ways to accomplish this but we don't fully understand many new ways at this point. We need to design our universities so they are flexible, agile, and forward thinking. Our goals need to be understood by others so they can understand why we will be doing some things differently and some things in the traditional manner. As an example, the concept of learner-centered education could serve as the foundation for making all choices.

The report develops these conclusions:

1. Arizona can appear either as a modern progressive state or as one that ranks with the poorest states relative to social and educational indicators. Despite a generally good economy, average income per capita, good universities, and diverse and unique resources, we fall below our national comparators with respect to investment in education, student preparation for college, and high school graduation rates, even when comparing Arizona with states with lower economic growth rates. Having these two very different images of Arizona makes it more difficult to chart a path for the future of higher education.
2. Many of the higher education problems facing Arizona also occur in other states (for example, access, funding, quality) and we can learn from the successful approaches of others but need to account for Arizona's uniqueness (for example, our number of universities is low and the population is highly urbanized, and we have a high in/out population migration).
3. Arizona has a substantial number of relatively recent (in last 10 years) studies by a variety of groups that address needs and offer solutions to higher education issues. This provides a rich reservoir of material that would be useful to any redesign analysis for the universities.
4. It is widely recognized in higher education circles that big changes are coming and some essential elements of addressing those changes are becoming more clear (but a number of potential impacts, positive and negative, are still not clear). There may be a need to redesign Arizona's universities but the preliminary needs assessment presented in the redesign study does not make the case. Before anything major is done, it may be worth developing a Strategic Vision for all of Arizona Higher Education, based on the future needs and learning from the several Arizona studies. If we don't do the study properly now, it may be a long time before we do it again, and we will have lost momentum and perhaps directed resources in the wrong direction.
5. Arizona universities and the State of Arizona have made significant changes to address future issues, developing innovative approaches in some cases (e.g., 2+2 programs with community colleges, e-learning, and a mixture of branch campuses, changing directions documents, and joint programs). By taking an approach of "build on demand" coupled with the innovative approaches, there is still a lot of room for growth in students or programs. We also have to recognize a single model of higher education will not work for the entire state.
6. There are many possible solutions to the issues facing Arizona higher education. Simply moving boxes on an organization chart as proposed in the reorganization study (the original and most of additional proposals) is not one them. Many feasible solutions can be achieved without significant reorganization and requires only policy changes on the part of ABOR and the universities. Still other solutions may require significant changes. The current redesign proposals are not based on likely future changes in education, the range of anticipated needs, or possible options for choosing a path from among the several potential solutions... This is a mistake.

Introduction

This report addresses the question “what is the best way to plan for sustaining Arizona universities in the next 15 or so years.” The Arizona University System Redesign Study could make changes that will last a long time, require significant resource expenditures, and need to be compatible with the universities and groups that interact with the universities.

In developing our faculty comments to the redesign proposals and needs assessment, we became concerned about the rationale for redesign being driven primarily by the number of expected students through 2020 and the comparison of ratios and average cost figures of groupings of universities in other states. Furthermore, the solutions described in the various proposals for redesign speak to some of the issues raised in the redesign project Scope of Work, but all of them focus on minor variations of what we are doing today. Specifically, the suggested changes seem only to revolve around how to treat the branch campuses of the existing universities, rather than address the concerns identified in the needs assessment.

It is our belief that within the 15-year planning horizon (to 2020) we will see major changes in how universities function. We further believe we should be focusing our redesign questions on the responsibility and function of a university in the future, and develop solutions with the future in mind.

In the last decade or so there has been much written about the possible changes facing higher education, with many authors calling these changes significant or transformational. These possible changes are germane to how Arizona should address its redesign process. The consistent theme among these studies is that change will be significant for universities. Thus we should be looking at events that may cause perturbations in trends rather than paying so much attention to extrapolations of current selected trends.

The Arizona Board of Regents is faced with several objectives – providing an excellent education to qualified students at a reasonable cost, addressing the state’s growing and diverse population of potential students and others, enhancing the stature of the three universities, and participating in and encouraging state economic growth through research results and an educated workforce and informed citizenry.

Making choices is even more complex than it first appears because of the difficulty of estimating the cost of each of the options, because of the competing demands on the state budget, and understanding the implications of the near certainties and the uncertainties of the future. In spite of this, we need to understand enough of each of these factors as we make today’s decisions regarding restructuring the universities.

This report does not offer specific solutions but does identify some possibilities of what the future of universities in Arizona could be like and some guidelines for design that fit a range of possible futures. There is a good deal of uncertainty about what the future of 2020 might be like, but some fundamental themes are likely to occur regardless of the assumptions one makes today. To address this uncertainty, we identified scenarios, prepared by others, which weave together possible changes, with no one scenario more likely than the others, so we would do better to visualize what is possible.

It takes a lot of effort to 1) decide carefully how we might want to change the universities, 2) define and implement the specific changes, and 3) have the changes become effective. The year 2020 is only 15 years. The decisions we make now will set the stage for the foreseeable future.

The Redesign Study Needs Assessment

The Redesign Study Needs Assessment has focused in two areas: 1) enrollment growth and 2) comparative data among states that have universities in various rankings by the Carnegie Foundation of Institutions of Higher Education. The case for restructuring seems to be almost exclusively based only on enrollment projections of the type ABOR staff

(generally using the Arizona Governor's Task Force on Education approaches) and WICHE (using national IPEDS data¹) have developed, and the costs of meeting those projections.

Presenting such projected growth in a graphical format, using a single set of projections, with no assumptions or ranges given, can lead to rushed reactions to "make some changes soon." Comparing states as a whole, lumping together all universities within a single Carnegie Classification, simply amplifies the problems that exist in comparisons among single institutions, and minimizes the history or unique situation of each institution.

However, even with these limitations on the needs assessment, the solutions identified in the redesign proposals do not address either the growth issue or the cost issue; they simply move boxes on an organizational chart. We are in a situation of "rearranging the chairs on the Titanic rather than watching for icebergs." If we simply move boxes (the chairs) on a chart, without looking at some of the possible important events in the future (the icebergs), we give the illusion of addressing a problem but in effect not planning for the real problems.

Long-term forecasting is very difficult, especially with the uncertainties in the next 15-20 years; even the best work one can do will have variation and uncertainty. In Arizona we have a long history of overestimating higher education enrollment growth. For example, the 1988 ABOR Task Force on Excellence, Efficiency and Competitiveness² developed six forecasts through 2004, based on varying assumptions. Some of these were higher and some lower than the previous enrollment estimates, and only the lowest estimate got close to the 2004 value (and it was almost right on target). In 1988, WICHE³ had forecast about 2.9 million high school graduates by 2004, and their 2003 report estimates 2004 at about 2.65 million. The Future Needs of the State (1986) had three projections, with two of them high and the most pessimistic about right for 2000. The Arizona Enrollment Demand Model (1991) "55,000 new students by 2010" number was widely cited but also widely recognized as being high (at earlier milestones dates). The AZ Auditor General⁴ report on ABOR also noted this over estimating on the part of Arizona higher education enrollment projections. The Governor's Task Force on Higher Education (1999) projected enrollments using four scenarios from 2000 to 2020. The estimates for 2005 were: 123,656, 119,748, 116,000, and 113,174. The actual number for 2004 was 114,235 (down 1,229 from 2003). The single projection used in the needs assessment roughly matches the most optimistic (of four options) Task Force on Higher Education numbers until 2020, when it is higher than the Task Force estimate.

By offering only one projection and not making it clear that there is uncertainty, we run the danger of not only missing the target but also of misleading those trying to look at redesign. By identifying the assumptions, uncertainties, and range of possible forecasts, we better prepare the reader to understand future possibilities, and thus do a better job of the system redesign project.

The original work (2002, and November 2004) and most recent data comparisons⁵ "Analysis of Arizona Higher Education Finance Compared to Nine Comparison States" (Penultimate draft, 12/07/04) compare Arizona to nine

¹ IPEDS is Integrated Postsecondary Education Data System operated by the U.S. Department of Education.

² ABOR Task Force on EEC Report. 1988 (page 1082), hard copy on ABOR office.

³ WICHE data on 2002 state profiles (for CA and AZ comparison).
<http://www.wiche.edu/policy/knocking/1988%2D2018/profiles.asp>

⁴ Arizona Auditor General - Universities' Enrollment Management - July 1998
<http://www.auditorgen.state.az.us/Reports/Universities/UniversitySystemWide/Performance/98-12/pa98-12.htm>

⁵ ABOR, September 2004. http://www.abor.asu.edu/special_editions/redesign/Needs%20Assessment%20Outline%209-27-04.pdf and December 2004 http://www.abor.asu.edu/special_editions/redesign/Arizona%20ANALYSIS.%20as%20presented%2012-7-04.pdf. The original proposal for redesign also included some of these projections, June 2004 http://www.abor.asu.edu/special_editions/redesign/SPBDMtg%20603exec%20sum%20reorg.pdf original "changing directions: razing Arizona or Raising Arizona" (2002) by David Longanecker is at http://www.abor.asu.edu/1_the_regents/initiatives/changing_directions/DL's%20Presentation.ppt – this was revised on July 20, 2004 to have the same title but more detailed data comparisons (no web address available).

states in a range of data types. These results are grouped by Carnegie Classification, so for Arizona (California in parentheses), there are 2 (8) research extensive, 1 (2) research intensive, and 2 (19) masters.

To show the difficulty in simple comparisons, this quotation is taken from the Statement of Purpose, Principles and Practices of the Association of American Universities Data Exchange⁶ (a group of universities that have shared comparative data for a long time and have refined definitions to continually improve the accuracy).

“AAUDE recognizes that exchange data, like IPEDS and other reported data, will have limited comparability” due to institutional differences in mission, structure, or definitions. To address this, we attempt to identify differences and flag them in the data so that institutions can select the more comparable sets of institutional data according to their own preferred or required needs and methodology or adjust for differences as necessary. This concept is incorporated as a practical approach to deriving relatively comparable data despite differences in institutional data. Thus, caution should be exercised in using AAUDE data for comparative purposes.”

A recent review of using IPEDS data for comparing universities concluded “While institutional research offices in every university make great efforts to report their data accurately and completely, the conventions used, the differences in context in each university, the different accounting systems, and the sometimes inconsistent or vague guidelines provided by various agencies make these data extremely difficult to use effectively. The complexities and errors identified in this paper provide useful cautionary examples to help those who use these data recognize the weaknesses in the underlying information. While the temptation to use such large-scale databases is strong, great caution in making significant generalizations or comparisons based on these data should become the constant watchword of all institutional research.”⁷

Therefore, one has to be careful when making decisions where the uncertainty is significant. This is a case where making comparisons by exception rather than by statistical closeness may produce better results. The IPEDS data are good for initial rough comparisons to see if we are in the general “ball park” of other universities – but trying to make specific detailed comparisons requires a significant understanding of the assumptions made about the data that were submitted by the individual universities.

In addition, the needs assessment was focused on the important driving forces of enrollment forecasts and methods of providing access to higher education at a reasonable price (for the student and the state). But there are other important sources of information that will inform the decision and could be integrated with the needs assessment. Examples are:

- Review relevant Arizona-specific studies about higher education
- Understand the purpose of a university in the 21st century and how our universities should function in 2020
- Identify alternative methods of addressing any anticipated growth and options for university funding (e.g., faster graduation rates, fewer out of state students, more 2+2 with community colleges, and more e-learning opportunities among the three Arizona universities)
- Develop scenarios to better understand the possibilities in our times of uncertainty. This approach makes it easier to consider all the factors that are important in the decision, rather than just those that can be easily measured.

There are also unexpected results that may shed light on what we might expect in the future, if we can find a way to explain them. For example, WICHE-projected high school graduates are rising fast for Arizona and are relatively flat for California. However, the US Census⁸ interstate migration patterns for 1995-2000 show this may simply be a bubble of migration from California to Arizona, which may not be sustained for our projection period to 2020. In addition, we must understand the possible implications if some of the assumptions change markedly, such as the percentage of Hispanic students graduating from college.

⁶ AAUDE <http://www.pb.uillinois.edu/aaude/>

⁷ Gater, Denise. 2003. Using National data in University Rankings and Comparisons. <http://thecenter.ufl.edu/gaternatldata.pdf>

⁸ US Census State to State Migration Flows 1995-2000 <http://www.census.gov/prod/2003pubs/censr-8.pdf>

The Winds of Change

Driving Forces of Change and Characteristics of the Future

Driving forces are the clusters of trends that have major impacts on the future⁹. While there are several groupings that can be defined, the five most significant for Arizonan universities over the next 15 years are:

1. Demographic and Social Shifts

The US population is both aging (the first baby boomers turn 65 in 2011) and growing in numbers of young. This causes the “dependency ratio” to increase (a smaller fraction of working age population to support the full population). The largest growth segment is the Hispanic population, especially in Arizona and other selected states, and the ages of most people moving into Arizona are the 20s and 30s (and their children). Events and trends in California greatly influence the population of Arizona, with large numbers of people moving between the two states (recently, for every two people moving from California to Arizona, one person moves from Arizona to California). Arizona experiences a high in/out migration rate with other states as well, although the number of retirement age in-movers has a small reverse out-migration to their original states. This population increase due to in-migration, combined with immigrants from other countries, over time, impacts the culture of the once dominant population.

2. Economy and Funding Sources

The financial circumstances through the 2010-2020 period are difficult to forecast. The key factors are being set in place today: a higher population dependency ratio, increasing public and personal debts, debates on taxes available vs services provided, issues relating to income disparities, trade deficits, and costs relating to health care. Balancing public budgets represents difficult political choices but the consequences of high deficits or reducing existing entitlement costs also present difficult choices. How this situation will be resolved is not clear, but the impacts on Arizona’s universities will likely be felt in many areas (e.g., interest rates, inflation, available federal funds for research, affordability of college, university funding from the state and state Medicaid/AHCCCS costs). Universities are diversifying their funding sources as the state appropriation for higher education continues to decline as a percent of overall state spending.

3. Technology and Its Use

The three major types of technologies expected to make major impacts in the next decade or so are: 1) biotechnology and related biosciences, 2) materials, and 3) information technology. The internet as most people would define it arrived in 1993, with the first graphics web browser. It is just over 10 years since this occurred, and there has not only been tremendous growth in the connectivity and number of people using internet, but there are large sectors of the economy that have become dependent on it for their daily functions; this includes universities. Technology (web, cell phones, and connections) in the last 10 years has dramatically changed the way society functions. Technology is beginning to make changes in the way learning is addressed by institutions and practiced by students; it will therefore have a large impact on universities over time.

4. Resources and Environment

Water supplies and quality have been recurring concerns, but because of the increased likelihood of climatic change and related weather uncertainty, there will be even more concern in the future. Alternative energy sources and energy efficiency efforts are expected to increase as oil prices rise due to declining reserves. Transportation and urban growth (megacities in particular) represent challenges for moving goods and people rapidly and efficiently. These changes can be addressed but they represent a new way of dealing with our basic “infrastructure” and life support systems. Overall, the central question is how to affordably sustain our organizations, environment, and economy.

⁹ See Exhibit 1 for more information on future trends and issues. Additional reference material can be found at: Morrison, James. 2003. U.S. Higher Education in Transition. Horizon Online Magazine, 1(1), pages 6-10. <http://horizon.unc.edu/courses/papers/InTransition.asp>

The US National Intelligence Council. (2004). Global Trends 2020 http://www.cia.gov/nic/NIC_2020_project.html

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5. Higher Education

New ways of “connectivity” and decreasing state support as a portion of the university budgets have changed the landscape for education. These changes in funding patterns will continue but raise issues related to the public nature of a public institution. Since the development of the world wide web, an immense amount of information is available to anyone, anywhere, and at anytime. With mobile phones, email and blogs and other group communication methods, students can be in frequent contact with friends, study partners, project teams, mentors and professors. These changes, and others (e.g., cooperative efforts with private enterprise, K-12, community colleges, or other institutions), have the potential to transform how we think of education. Even with the inertia commonly associated with a university, we can expect significant changes in the types of things we do and in the way we do them over the next 15-20 years.

Additional perspectives on how the future might unfold are in Exhibit 1.

Accounting for the Near Certainties

These trends in Arizona are near certain. What is not known is what form the impacts will take.

1. Increased diversity (especially Hispanics for Arizona and California).
2. Aging and migrating populations.
3. Infrastructure constraints become more evident (including transportation, energy, water, education).
4. Financial impact of the national debt and trade deficits, demands of Medicare/Medicaid in 2010-2015 period.
5. Collaboration, communication and working relationships among various groups become common.
6. Technology and intelligent devices become pervasive.

Understanding There Will be Uncertainties

Most of the driving forces and trends have uncertainties associated with them. For example:

1. How fast will a trend move, will it rise for a long time, crash, or level off, how will various trends interact?
2. What jobs exist in the future? How will we prepare the workforce for currently undefined jobs?
3. Will universities change from within or be forced from the outside?
4. How will taxes vs services and private vs public good conflicts be resolved?
5. Will sufficient funding be available (from all types of sources) to accomplish what we believe should be done?
How will competition for these funds affect us?
6. How and when will the initial impacts of global climatic change occur?
7. How will the concern over terrorism (physical, biological, electronic) impact our abilities to function?
8. Will there be a World War III or its modern equivalent?
9. Will offering more access in more locations and in more modes cause a greater increase in student demand than can be enrolled?

Addressing Future Needs

Recognizing the Transition State of the Present

Several recent events have changed the way we provide learning, with three primary ones taking precedence: 1) the use of the internet by masses of people, 2) individual choice through devices such as cell phones, walkman/iPod units, and 3) vast amounts of information easily and freely available. These changes can be described as “connectivity” – either technical or social (new social networks form through the available technologies). Thus, students (and others) can connect with essentially anyone, anyplace, anytime, nearly cost free.

This changes the way students and others assimilate information and learn and how they respond in a university environment.

These changes have only occurred in the last 25-35 years, about one generation (both the Sony walkman and the personal computer were developed around 1980, the original internet in 1969). We are still learning how these basic changes will affect the role of learning in a university and in society at large. At this point, we know more about how people learn than we are able to put into practice, and that the effects on universities and on learning in the future are

difficult to comprehend today. The generation of students entering college age today grew up with these communication options and information resources, and their expectations and habits may differ from past student generations as well as many faculty and other adults.

What might be the learning needs of students and others be in the next 15 years (to 2020), the period for the Arizona Universities Redesign Study? How will learners (e.g., students, faculty, citizens, and communities) want to learn and be capable of learning? What role will traditional universities play in relation to other ways of providing learning needs? How will their learning styles and expectations for learning options differ in 15 years?

We don't know – the possibilities are too great. However, we do know a number of things about learning, and we understand something about the possible options that could face us in the next 15 years. Some of these possibilities related to learning raise these questions:

- Will students do more self study and pass courses by exam, reducing the formal teaching load on the university?
- Will professors become more of a guide/mentor than a lecturer, thus increasing the time required of the instructor per student?
- Will we remove the constraints of historical structures (e.g., 50 minute class periods, one semester chunks, and classes with large numbers of students) in a single classroom.
- Will we invert the current sizes for freshman vs seniors, so that all freshmen take small seminars to avoid getting lost in the university and seniors take a combination of large classes and individualized learning?
- Will we learn more about our learner's needs, through continuing assessment and feedback, and personalize the solutions to learner?

The Central Role of Learner-Centered Education (LCE)

University learning is not an assembly-line process. You cannot make seemingly obvious but simplistic comparisons among universities on factors such as cost per degree. While it is possible to compare similar disciplines across similar universities, it requires an enormous understanding of the detailed processes and budget procedures of each university. A focus on learning also places the emphasis on *the* major product of a university. Other institutional accountability efforts follow from the learner-centered foundation -- access, affordability, quality, effectiveness, and efficiency. If we think "learner" first, and then address the other factors, they exert a positive rather than potentially negative force on the practical aspects of learning.

If learning is defined broadly, it becomes the central focus of the university – every decision is made with learning as the primary consideration. Students learn their course of study as well as how to interact with people while being exposed to new cultures. Faculty continually learn how their fields change and the research process itself is all about learning. Staff and administrators must continually learn to remain efficient and effective. The university engages itself with the community, helping others learn through outreach programs or special projects for various state or community problems. Detailed definitions, guiding principles, and LCE activities of the Arizona universities are at the ABOR LCE web site.

The Increasing Role of e-Learning

The role of internet and specialized modules in e-learning has made a tremendous change in the way faculty teach and students learn. A large number of classes, across nearly all disciplines, engage the student with some form of e-learning. The Center for Academic Transformation¹⁰ at Rensselaer Polytechnic Institute has sponsored and summarized a series of projects on curriculum redesign and learning approaches and identified new models of instruction. These approaches all incorporate information technology and range from minor additions to a regular class (e.g., providing web links for the class) to full on-line learning by a variety of experiences and techniques. Similar studies are reported by Educause¹¹ and MIT.¹² The Southern Regional Education Board developed their Electronic

¹⁰ Center for Academic Transformation, RPI, <http://www.center.rpi.edu/>

¹¹ Educause. Learner-centered approaches using traditional and e-learning. 1) Key Themes: Learner-Centered Principles and Practices (includes several examples for Maricopa Community College District, 2000)

Campus “Principles of Good Practice.”¹³ (The board function is similar to the Arizona Regent’s University but is multi-state and includes 16 states). The Arizona Partnership for a New Economy (APNE)¹⁴ “Hot Team” was “created to identify a “breakthrough” for Arizona, applying innovations created by the New Economy to help people learn the knowledge participate fully in the New Economy. The term we will use to link the innovations New Economy with building the knowledge and skills of people is “e-learning.” outlines possibilities for a breakthrough in this area — a breakthrough that would Arizona into a position to join the top tier of leading New Economy states.” The 2004 Sloan Consortium¹⁵ survey found “a majority of academic leaders now believe that online learning quality is already equal to or superior to face-to-face instruction.”

Emergence of Hybrid or Blended Learning Methods

Teaching (or learning) approaches vary over time, by subject, and student audiences, and by presenter. In the earlier days it was by voice and blackboard (seminar, lecture, discussion group, individual interaction), then this basic approach was augmented by overhead slides or color slide projector, then by PowerPoint slides and interactive white boards connected to a computer that is connected to internet. Different approaches were added in some settings to include student team work or individual internships outside the classroom, internet collaboration with students or presenters at other sites (including in other countries), and e-learning for any time/any place activity. We are now speaking of including some very old models (story telling) or very new approaches (international participation in learning based on gaming processes or new modes of social interaction with electronic support).

Which format or tool is the best depends on the circumstances. One cannot make a categorical statement that any one method is better or worse than others. The appropriate answer is there will be more than one format or tool in most settings. This type of learning is called hybrid¹⁶ or blended¹⁷. When practiced, it can be within a single class, or by a curriculum, or an entire degree. For example, a student during his/her university time might take a traditional semester-long course that combines several formats, a couple of classes totally by e-learning (from the local university and others), test out of some requirements by self-study outside any formal classroom, and work through internships or study abroad.

<http://www.educause.edu/LearnerCentered/940>, and 2) key themes: Learner-Centered Principles, Design & Practice (2003)
<http://www.educause.edu/2593>

National Learning Infrastructure Initiative (EDUCAUSE). 2004.

The NLI is a community that chooses to work together to shape the leading edge of teaching and learning with technology. Members come from all types of organizations—higher education, government, and corporations. The NLI is distinctive in that the members are actively engaged in the work of the organization. Site includes examples of key issues each year, articles, projects and their results, references on learning, and learner-centered principles. <http://www.educause.edu/nli/>

¹² Massachusetts Institute of Technology. 2004. The Education Arcade.

A consortium led by five departments at MIT on using games to educate students. These include highly interactive learning situations (either electronic or in person), to solving mysteries and understanding the issues involved, including the ability to produce “what if...” changes to see the impacts of alternative approaches, to working with students on various prototype learning approaches. Interaction includes ability to work with students worldwide. <http://www.educationarcade.org/index.php> See also Morrison, J. and C. Dede. Innovate. 2004. The Future of Learning Technologies: An Interview with Chris Dede (Dede is the Wirth Professor of Learning Technologies at the Harvard Graduate School of Education). <http://innovateonline.info/index.php?view=article&id=1&action=article>

¹³ The Southern Regional Education Board. <http://www.ecinitiatives.org/publications/principles.asp>

¹⁴ APNE Hot Team Best Practices for e-Learning (no date). <http://www.azcommerce.com/pdf/miss/elearning.pdf>

¹⁵ Sloan Consortium. 2004. Entering the Mainstream: The Quality and Extend of Online Education in the United States, 2003 and 2004. 21 pages. <http://www.sloan-c.org/resources/survey.asp>

¹⁶ Bleed, Ron. 2001. A Hybrid Campus for the New Millennium. <http://www.educause.edu/ir/library/pdf/erm0110.pdf>
Hybrid Course Website. Learning Technology Center, University of Wisconsin-Milwaukee. <http://www.uwm.edu/Dept/LTC/hybrid/>

¹⁷ Blended Learning Models. 2002. ASTD’s Source for e-Learning. <http://www.learningcircuits.org/2002/aug2002/valiathan.html>

The important concept here is that the choice is made based on the learning needs/desires of a complex set of interactions and one type of solution does not fit all institutions or all students or all presenters. A study by the University of Central Florida found that “blended courses--those that combine face-to-face instruction with online learning and reduced classroom contact hours--have the potential to increase student learning while lowering attrition rates compared to equivalent, fully online courses. This research bulletin reports the results of a disciplined UCF program that has led to a fundamental redesign of the instructional model.”¹⁸

Learning from Others

A good deal of discussion has occurred in the higher education community on the types of issues under discussion in our redesign study. Some are independent studies, some from national associations, and some from current or past university presidents. Much of what is said by these varied groups is similar and therefore becomes an important indicator to questions we should be raising.

Viewpoints of Current Presidents of U.S. Universities.

1. Jischke, Martin, President of Purdue University (2000 - current)¹⁹

Jischke recently spoke to a national educational association (our three universities are members) on how universities have evolved from the 1862 Morrill Act land-grant university beginnings and what we face in the future. Excerpts include:

“The land-grant agenda of access, practical and liberal education, basic and applied research, along with outreach, extension and engagement, is now clearly shared with many, many other institutions. As a result, the centrality of our land-grant universities to the vital issues facing contemporary society is less clear and less unique than it was 100, 50 or even 25 years ago.

“These issues include economic development, K-12 education, health care, community renewal, homeland security and the challenge of poverty, especially its impact on children. Virtually every university in the nation today is addressing some or all of these issues and promoting their ability to be a key player in the progress of their state. Morrill’s vision from the 19th century, powerful as it has been, must be adapted, reinvigorated, and reconceptualized for the 21st century. It is an imperative for change, and to me the choices are clear. If we continue business as usual, we will certainly see this continuing slippage in our support and importance

“Change can be seen as a threat or an opportunity. There are those who respond to change in the wind by trying to hunker down, preserve what is and keep from being blown over. They fear change. And there are those who welcome change and see it as the means of opening new possibilities and potentials.

2. Faulkner, Larry, President of University of Texas (1998 – current)²⁰

Falkner spoke in 2003 on “Public universities will survive, can public higher education? Excerpts include:

“There are at least five big forces on public higher education today:

¹⁸ Blended Learning. 2004. University of Central Florida evaluation of face-to-face, blended, on-line courses.

http://www.educause.edu/ir/library/pdf/ecar_so/erb/ERB0407.pdf (requires Educause/ECAR membership - ASU and UA are members).

¹⁹ Jischke, Martin. 2004. “Adapting Justin Morrill’s Vision to a New Century: The Imperative of Change for Land-Grant Universities.

<http://news.uns.purdue.edu/UNS/html3month/2004/041114.SP.Jischke.mrl.html>

²⁰ Faulkner, Larry. 2004. “Can Public “Public Universities Weil Survive. Can Higher Education?”

http://www.utexas.edu/president/speeches/clair_maple_080403.html

- The cost-compounding properties of a labor-intensive activity dependent on rare talent
- A reduced propensity in state capitals to provide strong public subsidies for public higher education
- Resistance among students, parents, and public leaders to increased charges for tuition and fees at public institutions
- Broadened expectations among civic leaders concerning universities as engines for regional economic development
- Intrinsic tensions among missions

“By far the most valuable advance would be to find ways to alter the model for educational delivery in a manner that supports preserved or improved quality, but reduced cost. I realize that this is very much easier said than done in our labor-intensive, talent-focused business, but we really do not have a choice. If the political limit model really does describe our future, we simply must reduce the rate of growth in the cost of education by 1.5% to 2.0% per year. That may not be easy, but it is probably not really out of reach, especially if we keep a focus on the target. We might achieve it without sacrificing quality if we work imaginatively. As we do, we need to look for opportunities concerning both components of the cost of education: salaries and operating costs. Real success will also be applicable to private institutions, and there would consequently be a reduced need for us to worry about the public significance of divergent paths for these two sectors.

Viewpoints of Former Presidents of U.S. Universities

1. James J. Duderstadt, former President, University of Michigan (1988-1996).

A University for the 21st Century, by James J. Duderstadt. 2000. The University of Michigan Press. 358 pages.

Dunderstat concludes: “We have entered a period of significant change in higher education as our universities attempt to respond to the challenges, opportunities, and responsibilities before them.’ This time of great change, of shifting paradigms, provides the context in which we must consider the changing nature of the university.

“Much of this change will be driven by market forces-by a limited resource base, changing societal needs, new technologies, and new competitors. But we also must remember that higher education has a public purpose and a public obligation. Those of us in higher education must always keep before us two questions: ‘Whom do we serve’ and ‘How can we serve better?’ And society must work to shape and form the markets that will in turn reshape our institutions with appropriate civic purpose.

“From this perspective, it is important to understand that the most critical challenge facing most institutions will be to develop the capacity for change. As we noted earlier, universities must seek to remove the constraints that prevent them from responding to the needs of a rapidly changing society.

2. James J. Duderstadt, and Farris Womack. *The Future of the Public University in America: Beyond the Crossroads*. 2003. The Johns Hopkins University Press. 236 pages.

Some of their conclusions and lessons learned are:

“Universities need to change in response to the changing needs of society. Among the issues are 1) the cost of a college education, 1) excellence, selectivity and exclusivity, 3) diversity, 4) research, and 5) finding ways to balance the needs of society with other university needs. They further address the challenge of university leadership in the digital age (technology is changing the way learning occurs and services are provided), the competition potential and the marketing need for colleges and universities, financing constraints (diversifying the resource base, establishing reserves, allocating and managing resources and privatization issues because of reduced state support). The authors build on the concept of the 1862 Morrill Act establishing the land grant university system (a university in each state originally focusing on the agriculture and industrial needs of the nation), and suggests something different for the 21st century (there have been several studies on what a land grant university might be like in the 21st century – or any other large state university). Duderstadt proposes a Learn-Grant university – designed to develop our human resources potential and the infrastructure to support a knowledge-driven society.

Some lessons learned:

Values – reconsider and understand the values held by those in the university – which should be changed? Values are the bottom line – the foundation that everything else is based upon.

Engaging stakeholders – engage internal stakeholders (faculty, staff, students, and administrators) and external stakeholders (who the university was created to serve).

Alliances – Increase the need to build alliances with other institutions to focus on core competences and rely on others to address the broader needs.

Experimentation – The world is changing rapidly and the future is uncertain. Experiment.

3. Frank H.T. Rhodes. *Former President, Cornell University (1977-1996)*

The Creation of the Future: The Role of the American University. 2001. Cornell University Press. 265 pages.

From his conclusions:

“The university must change, and it will, but it must change deliberately and responsibly. The challenge is not to revive a flagging institution but to re-energize a vigorous institution and thus make it even better. Only those institutions that can provide significant value-added to the bare bones of information storage and transmission and research are likely to maintain their financial support. This will require a greater selectivity in research and service ventures and a growing responsibility for meaningful validation and certification. It will require a return to the ancient concept of learning as the education of the whole person and a commitment to the deliberate use of the university community as both the vehicle of the individual learning and as a means of scholarly inquiry. It will require a reaffirmation of teaching as a moral vocation, of research as a public trust, and of service as a societal obligation. But certain things will not change, and the most significant of these is the role of the traditional residential university as the place to create and nurture leaders of each new generation. There will also be more students as nonresident, part-time, older, and distance learners in institutions quite unlike the research university. Rhodes also identified seven factors for a successful university:

- Will maintain institutional autonomy, lively faculty independence, and vigorous academic freedom, but will enjoy strong, impartial, public governance and decisive, engaged presidential leadership.
- Will be increasingly privately supported but increasingly publicly accountable and socially committed.
- Will be campus rooted but internationally oriented.
- Will be academically independent but constructively partnered.
- Will be knowledge based but student centered, research driven but learning focused.
- Will be quality obsessed but procedurally efficient.
- Will be professionally attuned but humanely informed.

4. Derek Bok, *Derek. Former President, Harvard University (1971-1991)*

Universities in the Marketplace: The Commercialization of Higher Education. 2003. Princeton University Press. 234 pages.

From the publisher: “Is everything in a university for sale if the price is right? In this book, one of America's leading educators cautions that the answer is all too often "yes." Taking the first comprehensive look at the growing commercialization of our academic institutions, Derek Bok probes the efforts on campus to profit financially not only from athletics but increasingly, from education and research as well. He shows how such ventures are undermining core academic values and what universities can do to limit the damage.

Commercialization has many causes, but it could never have grown to its present state had it not been for the recent, rapid growth of money-making opportunities in a more technologically complex, knowledge-based economy. A brave new world has now emerged in which university presidents, enterprising professors, and even administrative staff can all find seductive opportunities to turn specialized knowledge into profit.

Bok argues that universities, faced with these temptations, are jeopardizing their fundamental mission in their eagerness to make money by agreeing to more and more compromises with basic academic values. He discusses the dangers posed by increased secrecy in corporate-funded research, for-profit Internet companies funded by venture capitalists, industry-subsidized educational programs for physicians, conflicts of interest in research on human subjects, and other questionable activities.

While entrepreneurial universities may occasionally succeed in the short term, reasons Bok, only those institutions that vigorously uphold academic values, even at the cost of a few lucrative ventures, will win public trust and retain the respect of faculty and students. Candid, evenhanded, and eminently readable, *Universities in the Marketplace* will be widely debated by all those concerned with the future of higher education in America and beyond.

5. *Frank Newman, Former President of the University of Rhode Island (1974-1983), former Director of the Education Commission of the States, and director of the Futures Project (with Lara Couturier and Jamie Scurry). The Future of Higher Education: Rhetoric, Reality, and the Risks of the Market. Jossey-Bass. 284 pages.*

After reviewing chapters with titles like: Higher Education in the Grip of Transforming Change; the New Competition; the Coming of the Market; the Growing Gap Between Public Needs and the Reality of Higher Education; Autonomy, Accountability, and the New Compact; Who is Responsible for Student Learning?; and Expanding Access and Success, he discusses strategies for a new era and a decade of opportunity. The strategies include: Developing a different strategic plan, one that has specificity, mission, public purposes, focus, sharing, diversified funding, collaboration, and reputation. His opportunities for the decade include engaging the public in a serious debate on the future of higher education, and rebuilding the compact between higher education and the public.

Newman identifies 8 public purposes of a university:

- Improve the quality of learning so as to ensure the skills and knowledge that will be required for the workforce.
- Improve the quality of learning so as to reflect the skills, knowledge, and commitment required for active participation in the civic and social life of the community.
- Provide access and academic attainment for a steadily broadening share of the population of all races, ages, ethnicities, and socioeconomic backgrounds, focusing particularly on access and attainment for those currently underserved.
- Serve as an avenue of social mobility for lower-income and minority citizens.
- Serve as the location (virtual or physical) of open debate and discussion of critical, and often controversial, issues of importance to the community, where the emphasis is on evidence and analysis and the opportunity exists for all sides to participate.
- Support development of high-quality elementary and secondary education through improved education of teachers and school leaders, alignment of curriculum and purpose with the schools, assistance with school reform, and improved research about education.
- Undertake research and scholarship in a manner that is trust worthy and open, in a widening array of fields that serve to advance society.
- Bring the benefit of the knowledge and skills accumulated in colleges and universities to the benefit of the community through outreach and service.

See additional comments by Newman under the American Council on Higher Education section (below).

Formal Studies About the Future of Higher Education

American Council on Higher Education/Futures Project

The American Council on Higher Education and the Higher Education Futures Project have addressed a series of issues facing higher education and leading to possible transformations.²¹ Some areas of significant discussion about the future relate to access, funding, accountability, and the market place. The basic concern is decreased state funding is driving public universities to become more private-like, with resulting issues on the “publicness” of the public university. ACE has called this the “social compact” and is devoting its annual 2005 meeting to this subject. The compact is between government, citizens and institutions to finance public education, and that has been changing beginning in the 1980s. The Futures Project’s Frank Newman wrote a 2004 article in the Chronicle of Higher Education²² titled “Higher Education isn’t Meeting the Public’s Needs”, where he notes the changes underway in higher education are raising questions such as: 1) what are the social as well as economic goals for expanding access to higher education?, 2) what restraints on market forces are needed to preserve the public’s interests?, 3) as boundaries blur, where is the appropriate dividing line between nonprofit and for-profit, between public and private?, 4) how much are the benefits to the student seen as a public good and how much as a private good?, 5) who pays for what?, 6) what skills, knowledge, attitudes, and capacities must graduates have for the work ahead?, 7) how much is a college education about the educated person, the life of the mind, and development of civic skills?, 8) how can the quality of learning be ensured?, 9) how can society ensure the integrity of research? 10) has the institution recognized the centrality of teaching and learning, even if it as research university?, 11) has the institution served the public as a center of open discussion of controversial issues in a way that values evidence and analysis, or has it reneged on that responsibility to avoid offending donors and the community?, and 12) what expertise does it have that can be shared in ways that improve society?

Association of Governing Boards

The AGB on a biennial basis summarizes the top public policy issues facing higher education. The ten issues²³ for 2003-2004 are:

- Homeland security (higher education must implement costly federal laws to increase homeland security).
- Affirmative action (implications of the Supreme Court affirmative decision).
- Deteriorating economic and fiscal environment (and implications for higher education).
- Surging numbers of diverse students (representing a new generation of students).
- Rapid tuition increases (declining state appropriations forced higher education to significantly increase tuition).
- Reauthorization of the Higher Education Act (affecting student aid and other issues).
- Federal tax policy (policy changes have sharply divided congress and the nation).
- Assessment and accountability (state and federal government want tests and to hold higher ed accountable).
- Scientific research (challenges on available budget, ethics, and bring research results to market).
- Intercollegiate athletics (continuing issues of control, finances, and equity).

²¹ American Council on Education. 2004. *Rewriting the Rules of the Game: State Funding, Accountability, and Autonomy in Public Higher Education*. 14 pages. Other related ACE publications are listed in references.

http://www.uri.edu/pspd/planserv/2004_rewriting_the_rules.pdf

American Council on Education. 2004. *Diversity, Access, and the Role of the Market Place*. 20 pages.

http://www.acenet.edu/bookstore/pdf/2004_higher_ed_overview.pdf

American Council on Education. 2004. *Shifting Ground: Autonomy, Accountability, and Privatization in Public Higher Education*. 14 pages.

http://www.acenet.edu/bookstore/pdf/2004_shifting_ground.pdf

Futures Project. Established in 1999 with two goals: 1) to stimulate an informed debate about the role of higher education in our new global society, and the opportunities and dangers presented by a global market for higher education, and 2) To develop policies that ensure a skilled use of market forces to maximize the opportunities while minimizing the dangers. The website contains a series of policy papers and scenarios. The project resulted in a book: Frank Newman et al, 2004. *The Future of Higher Education*. <http://futuresproject.org/>

²² Frank Newman et al. *Chronicle of Higher Education*. October 15, 2004. Higher Education Isn’t Meeting the Public’s Needs.

<http://chronicle.com/temp/reprint.php?id=okwsjmrk1gqi70mfe31tgz5eswqqzd>

²³ AGB “Ten Public Policy Issues for Higher Education in 2003-2004”.

The AGB has also addressed “Fulfilling the Promise of Civic Engagement²⁴” where the modern movement of an old topic is heading to “integrating the essence of civic engagement into courses, research, and faculty work.” The issues behind this focus are similar to those described above in the section on the American Council on Education on the goals of higher education.

Kellogg Commission on the Future of State and Land Grant Universities

The National Association of State Universities and Land-Grant Colleges (all three Arizona universities are members) in 1996 began the Kellogg Commission on the Future of Universities.²⁵ The final report (2000) “Renewing the Covenant: Learning, Discovery, and Engagement in a New Age and Different World”, addresses the relationship between the public and the universities. The address reasons for a need to change, and expresses concerns about the urge to “privatize” public institutions. They suggest changes by the institutions and the public to focus on universities for the 21st century. A new kind of public institution would evolve.

<i>Stakeholder</i>	<i>Existing Covenant</i>	<i>New Covenant</i>
Federal	Seed funds from sale of the public's lands to establish public universities. Support for basic research. Support for student aid.	Support to enable public universities to attain the technological infrastructure needed for advanced information technology operations. Support for discoveries and new policy encouraging private investment in university-based research and research parks. Tax policy establishing educational savings accounts, available throughout a student's lifetime.
State	Establish public universities. Provide basic financial support. Commitment to low tuition.	Provide continuing support and create partnerships with public institutions to engage with public needs. Commit to strengthen academic governance through appointment process for boards and presidents. Leadership to maintain affordable access, responds to challenges of globalization.
University	Teaching, Research, and Service. Access for the sons and daughters of low-income and working families. Research and services focused on agriculture and mining challenges of the time.	Learning, Discovery, and Engagement. Access for the full diversity of America and lifelong learning contracts with students. Discovery and engagement focused on pressing educational, social, economic, scientific, and medical challenges of our times.

²⁴ AGB “Fulfilling the Promise of Civic Engagement, by Tony Chambers and John Burkhardt. 2004. Published in AGB Priorities, Number 22, Winter 2004.

²⁵ Kellogg Commission on the Future of State and Land-Grant Universities. 2000. *Renewing the Covenant: Learning, Discovery, and Engagement in a New Age and Different World*. http://www.nasulgc.org/publications/Kellogg/Kellogg2000_covenant.pdf

National Governors Association

The NGA has developed three reports that have special relevance²⁶ for Arizona's redesign project. The report on "Influencing the Future of Higher Education" identified four "first principles for the future of higher education". These include: 1) insist that higher education contributes to the state's economic development, 2) confront the challenge of educating a more diverse citizenry, 3) promote a customer orientation (the learner, the employer, and the public who supports educational opportunities), and 4) hold high expectations for postsecondary education providers, and expect results. The NGA will focus on three areas for future reports: 1) increasing student access, learning and degree attainment, 2) creating seamless learning pathways, particularly preK-16 systems, and 3) fostering economic development.

The State of e-Learning in the States report made four conclusions: 1) Should duplicative and costly programs be restructured in light of students' growing anytime, anywhere access to high-quality content that may come from out-of-state providers?; 2) What incentives may be needed to stimulate private-sector involvement in e-learning courseware to improve the productivity of low-skill, low wage workers, which otherwise yields lower returns on investment than courseware for higher-paid, already-educated, technologically sophisticated employees?; 3) How can states help integrate the best content and delivery from both the public and private sectors to increase access to state-of-the-art e-learning?; and 4) How can states best pursue their legitimate public interest in consumer protection and quality assurance, while not stifling the rapid evolution of e-learning and the entry of dynamic new providers? The NGA has also identified "State Strategies for the New Economy"²⁷, which includes success factors for state governments: flexible and adaptable; consumer-friendly; reinvented with technology; innovative; performance-driven; and accountable.

The report on "Fulfilling the Promise of Civic Engagement (2004) notes that in addition to "preparing undergraduates students for a career", it is also important to "prepare students to be responsible citizens", citing a recent opinion poll that the public rates both functions as high. Civic engagement is more than volunteering in the community, and the report concludes that "few institutions are integrating the essence of civic engagement into courses, research, and faculty work, that that is where the movement is heading."

Selected Individual Authors

1. Clark, Burton C. 2004. *Sustaining Change in Universities: Continuities in Case Studies and Concepts*. Open University Press. 232 pages. (Professor of Higher Education Emeritus)

How are entrepreneurial universities initially formed and how do they sustain themselves? Burton addresses this question in a newsletter article describing the book.²⁸ The material below is taken from his newsletter.

"I searched for exemplars of entrepreneurial action—and stronger conceptualization. I turned to 14 internationally distributed case studies, including brief narratives on six diverse research universities in the United States (two private, four public), which exemplify aggressive institution building under the spur of intense competition—Stanford and MIT, Michigan and UCLA, North Carolina State University and Georgia Institute of Technology.

"The newly highlighted dynamics of change stress, first, mutually supportive interaction among transforming elements; second, a newly established forward-looking "perpetual momentum"; and, third, behind the scenes, an institutionalized collective will which stimulates and guides a self-sustaining and self-selecting forcefulness in responding to societal demands. In one case after another, we find an "assertive bureaucracy" of change: such professional staff as development officers, grants and contracts officers, and continuing education officers—

²⁶ National Governors Association: Influencing the Future of Higher Education (2004) <http://www.nga.org/cda/files/FUTUREHIGHERED.pdf> and the State of e-Learning in the states (2001) <http://www.nga.org/cda/files/060601ELEARNING.pdf>

²⁷ NGA "State Strategies for the New Economy" 2004.

²⁸ Center for International Higher Education, Boston University, Newsletter, Winter 2005. http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News38/text001.htm

nonacademic personnel who are much more forward-oriented than the traditional “administrative” staff who served on behalf of the funding public authority and higher regulatory boards and councils. We see the overall sustaining capacity become a virtual steady state of change, a character not dependent on a commanding CEO or a brilliant management team. Change becomes a habit, an institutionalized state of being.

“Without doubt, active complex universities, operating in different complex environments, develop complex differentiated answers. In contradistinction to system-level analysis, institution-level inquiry stays close to those realities. System analysis misses key aspects of university development, particularly the organic nature of university change. It readily loses its way in the swirling fog of national policy statements and the iron cages of categorical state steering. Institutional studies are better grounded.

“Perhaps most enabling of all, we find the entrepreneurial university to be a place that diversifies income to the point where its financial portfolio is not heavily dependent upon the whims of politicians and bureaucrats who occupy the seats of state policy, nor upon business firms and their “commercial” influence, nor even upon student tuition as main support. Funds flow not only from such well-identified sources but also, crucially, from a host of public agencies (other than the core-support ministry or department) and alumni and other private donors who provide moral and political support as well as direct year-to-year funding and accumulation of endowment. Effective stewardship comes to depend not on the state or on “the market,” but on university self-guidance and self-determination. The entrepreneurial university does indeed provide a new basis for achievement.

2. Shires, Michael. 1996. *The Future of Public Undergraduate Education in California*. Rand Corporation.

The report²⁹ indicates: “In 1960, the state of California adopted the language of the California Master Plan for Higher Education as its policy and strategy for higher education. That plan had two major components: (1) it specified the roles and missions of each of the four segments of the state's higher education sector, and (2) it stated that each Californian who could benefit from higher education should have access to it. The Master Plan has successfully served as the model through which the state's higher education sector has grown and thrived. This growth has in turn provided the fuel for the state's economic engine and supplied the seed for the growth of its high technology and aerospace sectors.

“The level of access is expected to decline from today's 89 percent of pre-recessionary levels to 62 percent in 2005-06 and to 56 percent in 2010-11. Even in an optimistic fiscal scenario, the service levels would rise to only 65 and 58 percent for 2005-06 and 2010-11, respectively. This would be a marked decrease in the level of higher education access provided in the state and would eventually *leave more than one million students unserved* in 2010-11.

“Implications for higher education are: Because of the prospects of continued access deficits in California, two actions are proposed. First, the state must commit to its investment in higher education and the sector must find new ways of maximizing the state's return on that investment. Second, the state must restate or readdress the Master Plan in light of current and future realities. It can no longer provide the level of access it envisioned in 1960, and some new guidance has to be given for allocating the precious and scarce units of education that will be available in the future.

“The current Master Plan is arguably a major reason for the state's tremendous success over the past 35 years. A new Master Plan will be the key to the state's next 35 years. The sooner such an effort can be undertaken, the sooner the sector's goals and objectives can be redirected to springboard the state into the next century.

State Rankings: Arizona is Out of Step with Many National Trends Education Topics

1. *Measuring Up* (<http://measuringup.highereducation.org/>). Grade is based on index composed of 3-13 characteristics in five categories). Information based on 2004 survey data for students ready for higher education.

1. Student Preparation for college (AZ=D) - 45 states are rated higher than AZ.

²⁹ Rand Corporation. 1996. *The Future of Public Undergraduate Education in California*.
<http://www.rand.org/publications/MR/MR561/>

2. Student Participation – opportunities to attend college (AZ=B+) - 13 other states are rated higher than AZ.
3. Student Affordability (AZ=F) – 34 states are rated higher than AZ.
4. Completion – complete college on a timely basis (AZ=C+) – 33 states are rated higher than AZ.
5. Benefits to state (of educated population - civic, skills AZ=B) – 14 states are rated higher than AZ.

Percent of 18-24 year olds with high school diploma or general education degree – AZ is 54th, the lowest state or territory? How can there be 54?

2. *Post-Secondary Education Opportunity* (<http://www.postsecondary.org/>). Based on Census and National Center for Educational Statistics Data. Care should be taken in looking at a single year; some data have a smooth trend, and others bounce around – universities include both public and private

In Arizona, the appropriation of tax funds for higher education per \$1000 personnel income peaked in 1974 (at 15 dollars? What units?) and in 2004 was still dropping (at 6). This ranks Arizona as 36th in the U.S. (in this category a low number ranking is poor).

The College Participation Rate for Dependent Family Members 18 to 24 Years Old from Low Income Families in Arizona (2002) was ranked 48th in the U.S. at 15.8%. (in this category a low number ranking is poor)

Arizona Higher Education Expenditures as Percentage of Gross State Product (2000) was ranked 25th in the U.S at 1.6% (gradual decline from over 2% in the mid 1970s and 80s). (in this category a low number ranking is poor).

Chance for College by Age 19 in Arizona (2000), 29.6%, placing Arizona 48th in the U.S. (in this category a low number ranking is good).

Public High School Graduation Rates for Arizona (2001) is 70.5%, ranking it 28th in the U.S. (in this category a low number ranking is bad).

State Appropriations in Arizona for student financial aid (1997) is 0.4%, ranking it 45th in U.S. ((in this category a low number ranking is bad).

Percent of students remaining in Arizona to enroll in college is 12.4%, ranking it 12th in U.S. (in this category a low number ranking indicates more students remain in their home state).

Percent out-of-state students in Arizona universities is 25%, ranking it 32nd in the U.S. (in this category a low number ranking indicates fewer out of state students).

3. *National Information Center for Higher education Policy Making and Analysis* (maintained by NCHEMS – National Center for Higher Education Management Systems). <http://www.higheredinfo.org/>

Six-year graduation rate of Baccalaureate degree institutions (2003). Bachelor's Degrees Awarded as a Percent of High School Graduates Six Years Earlier (%) AZ ranks 6th at 63%. (in this category a low number ranking is good).

Three-year graduation rate for Associate degree institution (2003). : Associate Degrees Awarded Per 100 HS Graduates 3 Years Earlier. AZ ranks 9th at 28%. (in this category a low number ranking is good).

Population and Income Topics

These entries are from the Statistical Abstract of the U.S. <http://www.census.gov/statab/www/ranks.html>

Federal aid to state and local governments per capita (2002): Rank 33

State government general revenue per capita (2001): Rank 49

Infant mortality rate (20001): Rank 26

Doctors per 100,000 population (2001): Rank 41

Resident Population, Under 18 Years Old (2002): Rank 5

Resident Population, 65 Years and Older (2002): Rank 24

Full-Time Equivalent State Government Employment Per 10,000 Population (2001): Rank 45

Related Children Under 18 Years Old Below Poverty Level (1999): Rank 12

Total Persons Below Poverty Level (1999): Rank 14

Median Household Income (1999): Rank 27

Resident Population, Percent Change (2000-2003): Rank 2

Recent Studies in Arizona About Arizona Education

There are several education-specific studies as well as others that are related, that are specific to Arizona, and developed by Arizona sources that provide guidance for the issues that need to be addressed. We need to review and integrate what has been done, then to see new definitions of the problem.

Arizona Town Hall

The Arizona Town Hall organization (Arizona Academy) meets twice a year to address issues identified by the roughly 2000 member organization. They issue reports and recommendations; recent copies are posted on their web site: <http://aztownhall.org>

2004. Pre-K-12 Education: Choices for Arizona's Future (includes sections on teacher education and high schools)

2003. The Realities of Arizona's Fiscal Planning Processes (relevant to potential funding changes)

2002. Arizona Hispanics: The Evolution of Influence (concludes education is the key to moving together for a better Arizona).

2001. Moving All of Arizona into the 21st Century Economy (includes section on Arizona's universities and community college system).

2000. Higher Education in Arizona for the 21st Century (full report devoted to higher education).

Recommendations from the above reports that are particularly germane to the question of university system redesign and selected from the on-line summaries by the two Arizona Town Hall sessions most devoted to higher education are:

From the May 2001 "Moving All of Arizona into the 21st Century Economy:

1. Arizona needs a collective vision for the future and must coordinate existing plans, such as Growing Smarter and the Arizona Partnership for the New Economy, to rapidly implement these existing plans. This unified implementation plan should address education and technology and the needs of our diverse population. The critical importance of these plans and the compelling need for swift implementation must be communicated throughout our public and private sectors.
2. Arizona's existing infrastructure is inadequate to move all of Arizona into the 21st century economy. Improvements need to be made in the areas of social infrastructure (such as health care and education) and technical infrastructure (such as transportation, communications, human and natural resources).

From the May 2000 "Higher Education in Arizona for the 21st Century:

1. In order to ensure the state is competitive in the New Economy, we must encourage and support research, technology transfer, work force development and entrepreneurial activities at higher education institutions.
2. While it is important to prepare students for future employment and to meet the needs of the New Economy, it is equally important to educate well-rounded, thoughtful individuals...it is critical to integrate a liberal arts education with educating students to participate in the evolving technology-based economy.
3. The three-part public governance system (the Arizona State Board of Education, the State Board of Directors for Community Colleges and the Arizona Board of Regents) is adequate, but should be improved. Town Hall strongly recommends that these existing governing bodies, in collaboration with local governing boards,

- identify a process by which a well articulated master plan integrates the delivery and funding for education in Arizona. With one voice, this plan should be presented to the public and the legislature for debate.
4. Financial support for education in Arizona should be appropriately balanced between the individual student and the public. Out-of-state tuition at Arizona institutions should reflect at least the full costs of attendance. In-state tuition should remain consistent with the Arizona Constitution and permit maximum accessibility to education.
 5. In order to meet student needs, particularly in rural Arizona, the existing institutions of higher education should function in new ways. We should encourage our educational institutions to expand what they do well, but also to collaborate and partner with each other and avoid unnecessary redundancy.
 6. The Arizona higher education system must have a funding source that keeps pace with the needs of the system. The current basic state funding model for both public universities and community colleges is an obsolete paradigm that is tied to student enrollment and the academic year. It is incumbent upon policy-makers and leaders in the community, business arena and higher education to develop a new funding policy to substantially increase funding and make Arizona not only competitive but excellent.

This May 2000 report also has a section on “strategies for the future” which includes:

Arizona must continue to improve and strengthen effective bridges and linkages between preK-12 schools, community colleges, tribal colleges, public universities and private postsecondary institutions and their local governing bodies. We must create a community of educators that allows the Board of Regents, the State Board of Directors for Community Colleges and the State Board of Education to speak with one strong voice to the Legislature and to the Governor.

Town Hall supports dual enrollment programs, advance placement programs, 2 + 2 programs, public and private sector mentoring programs, the use of best practices (studying and evaluating data on existing efforts), increased linkages with alumni and businesses such as internships and cosponsored initiatives, sharing and exchanging faculty and voluntary community service programs. Town Hall also celebrates the existing transfer articulation agreements and other collaborative efforts that enable a seamless transition from preK-12 to universities, and supports continued improvement of this system. Inner-connections via our libraries and the Internet promote linkage among the components of Arizona’s education system. These collaborative efforts should focus on the shared vision and common goals of the various components of our educational system, and should recognize the broad representation of various groups within our society. These collaborative efforts should be marketed more effectively to the public. Moreover, a coordinated curriculum should be student-centered, addressing the needs of a wide variety of students such as those in alternative degree programs, teacher preparation programs and continuing education units.

The objective of Arizona’s higher education system should be to advance learning through the integration of teaching, research and service, with the incorporation of on-site and distance learning to produce well-rounded individuals capable of critical thinking and analysis who are well-prepared for the work force, for participation in community life, the arts and for leadership in governmental institutions.

Flexibility is the key to effectively responding to the demands of the New Economy. The higher education system needs to be able to respond to change with the same speed that business does, and must allow for more freedom and flexibility. Examples of flexibility include: programs across curricula, experiential education, internships, rotating faculty through business and industry with education faculty rotated through the schools, and greater focus on scholar-practitioners within our faculties. Deeply entrenched bureaucracies and deeply entrenched ways of thinking need to be challenged in order for our higher education system to be able to respond quickly to changing demands.

The combination of research and training is an important element of higher education and funding for research and development should be increased. A focused, substantial and sustained investment in research, technology transfer and innovation related to the New Economy must be undertaken by Arizona and its universities. We must be better prepared to support and sustain the needs of employers so we can attract industry to this state and meet the needs of the industry located here. To achieve this result there needs to be a focused commitment from the higher education system to work with employers to identify strengths in areas in which Arizona’s institutions of higher education can take a world-class leadership position.

New innovations in higher education and training should be explored to serve the educational needs of the work force required for the New Economy. If this is not done immediately, high-wage, high-taxpaying businesses will leave Arizona, further reducing the funds available for education, even as we need additional funding.

Battelle Memorial Institute Study for Arizona Board of Regents/Commerce Department

From 2002-2004 Battelle prepared a series of reports for the Arizona Department of Commerce, and the Arizona Board of Regents as part of the Arizona Statewide Economic Study (more information available at <http://www.azcommerce.com/Economic/default.asp> profiles on specific Arizona counties at http://www.azcommerce.com/Communities/community_profiles.asp)

Core Competencies (non-biomedical)

From: Positioning Arizona's Research Universities: Science and Technology Core Competencies Assessment (April 2003)

<http://www.azcommerce.com/doclib/PROP/final%20april%20AZ%20Core%20Competency%20ExecSum.pdf>

Six core competencies are: Ecological Sciences, Agriculture and Plant Sciences, Space Sciences, Computer Modeling & Simulation, Electronics & Optics, and Chemistry & Materials.

Battelle identified three technology platforms for operationalizing these core competencies:

- Bioscience (e.g., genetics, diseases, bioengineering, agbiotechnology, health, neurosciences)
- Advanced Communications and Information Technology (e.g., embedded technologies)
- Sustainable Systems (e.g., water, natural resources, environment, agricultural sciences, health, energy)

When these are combined with the biomedical competencies you get: Information technology and Communications, Sustainable systems, Bioengineering, Neurological sciences, Cancer-therapeutics.

Governor's Office

2001. Arizona Partnership for a New Economy (APNE). Developed by the Governor as a public/private partnership. The final report was in 2001. More information is available at <http://www.azcommerce.com/pdf/apne/finalreport2001.pdf>

2000. Governor's Task Force on Higher Education, Arizona at Risk: An Urgent Call for Action.

Includes issues and strategies on increased participation, increased research and business development, increased capacity and productivity, need for investment/accountability/outcomes. It concludes 1) Arizona is at risk if it does not become a leader in the new, global, knowledge-based economy, and 2) Arizona's institutions of higher education are the keys to developing the state's workforce and strengthening its economy. The report identifies three strategies for "The Plan for Higher Education" – 1) increase participation (raise the level of participation in higher education), 2) increase research and business development (increase the amount of targeted research, technology transfer and business development provided by higher education), and 3) increase capacity and productivity (enhance the human, physical, and technological capacity of institutions of higher education). (No web page available).

2000. Governors Council on Innovation and Technology (GCIT). The GCIT was established by the Governor after the Arizona Board of Regents modified its commercialization policies and Proposition 301 funding became available for the universities to accelerate their commercialization programs. The Council recommended in 2000 a multi-year roadmap that incorporates the universities, private enterprise, and state and local government to foster a diverse technology industry base in Arizona. More information is available at <http://www.gcit.az.gov/>

1990s. Governors Strategic Planning and Economic Development (GSPED). Began in the early 1990s as a private initiative to develop a strategic plan for Arizona, the effort was converted to GSPED in the late 1990s. The clusters continue to operate in Phoenix and Tucson, but much of the statewide effort has been subsumed by the high technology activities currently underway. As of 2004, the clusters and foundations are below.

- Clusters (11): bioindustry, environmental technology, food/fiber/natural products, high technology, minerals and mining, optics, plastics and advanced composite materials, senior industries, software and information, tourism, and transportation/distribution.
- Foundations (7): capital, human resources, information and communications, infrastructure, physical infrastructure, quality of life, tax and regulation, and technology. More information is at http://www.azcommerce.com/gsped/gsped_clusters.asp

Morrison Institute for Public Policy

The Morrison Institute for Public Policy at ASU has developed a series of reports that assess issues of interest in Arizona. Reports are available at: <http://www.asu.edu/copp/morrison/>

2003. Strategies to Improve Arizona's Standing in Science and Technology (What would smart, sustained investment in a high tech future look like in Arizona?) The examples of 4 competitor states suggest that Arizona needs:

- Lasting, enthusiastic leadership that recognizes the economic value of science and technology
- The right message and strategy to convey the urgency of this matter
- Investment in the creation and sustenance of first-tier research institutions
- More and better mechanisms to improve the transfer of ideas into the marketplace
- A belief that the state can be a leader in science and technology

2002. The Coming of Age -- *Four Scenarios of Arizona's Future*: Aging, Health and the Capacity to Care (scenarios are: Boomers Bust the Budget, Technology Enhances the Good Life, Who Will be Able to Afford the Future, and Arizona Takes Charge).

2001. Arizona Policy Choices—Five Shoes Waiting to Drop on Arizona's Future (the five shoes are: A Talent Shake Up, Latino Education Dilemma, A Fuzzy Economic Identity, Lost Stewardship, and The Revenue Sieve).

2000. The New Economy: Policy Choices for Arizona. (Invest in New Ideas and Knowledge: Research & Development, Workforce Development: Making the New Economy Work for Everyone, Come Together: Strategic Alliances for a Competitive Advantage, Work Smarter: Using Technology Wisely, Place Matters: Investing in Quality of Place).

1999. The New Economy: A Guide for Arizona (characteristics are: Technology is a Given, Globalism is Here to Stay, Knowledge Builds Wealth, People Are the Most Important Raw Material, There's No Such Thing as a Smooth Ride, Competition is Relentless, Alliances Are the Way to Get Things Done, Place Still Matters—But for Different Reasons.

Public Opinion About Education

A 2004 survey³⁰ by the Arizona Educational Policy Initiative (a collaboration of ASU, NAU, and UA) found:

- Arizona parents think the schools their children attend and the teachers who teach their children are doing a good job.
- The biggest challenge facing Arizona schools is lack of money, according to parents. Perhaps that is why they do not favor spending tax dollars to support students attending private schools.
- Parents support providing instruction in both a child's native language and in English. This puts them at odds with current Arizona policy.
- Hispanic and non-Hispanic parents hold very similar views about public education in Arizona.

³⁰ Merrill, Burce. 2004. Parent Attitudes About Education in Arizona: 2004. Education Policy Studies Laboratory, Arizona State University. 20 pages
<http://www.asu.edu/educ/eps/ AEPI/EP SL-0404-101-AEPI.pdf>

Public Agenda³¹ lists people's chief concerns about education (the actual surveys are from a variety of sources):

- Majorities say getting a college education is more important today than it was 10 years ago.
- Six in 10 parents of high school students say a college education is absolutely necessary for their child.
- Among parents, Hispanics are the most likely to say a college education is the one thing that can most help young people succeed.
- Slightly more than half of the public says their job does not require a college degree.
- Two-thirds say it's possible to be successful in today's work world without a college education.
- Half of those with children say they are very concerned about being able to save enough money to put a child through college.
- Hispanic parents are far more likely than black and white parents to say they are "very worried" about being able to afford college expenses.
- Most people say students have to borrow too much money to pay for college and majorities agree with the view that the cost of higher education should not prevent qualified students from going to college.
- Most people say if someone really wants to go to college they can find a way to pay for it and almost anyone can get financial aid or loans.
- Americans are divided on the definition of affirmative action.
- Most say less qualified students are "often" or "sometimes" accepted to colleges as a result of affirmative action.
- Only a quarter say the number of minority college students would decline without affirmative action
- Most college professors doubt a high school diploma guarantees "the basics," but majorities of students and teachers say it does.
- Most college professors say freshmen and sophomores lack basic writing, grammar and math skills, but they commend students' computer skills.

Zemsky³² reviews the history of higher education since WW II with an emphasis on the role it played in pursuing broad societal goals; he concludes that more was done in these earlier years than is done today. Some of the reasons for this change include: 1) faculty and students began focusing on their own preferences (because of the violence and demonstrations in the 1970s), 2) institutions believed economic survival depended on being more responsive to market forces, 3) experiences became more important than ideas, and 4) higher education became more privatized (increased tuition, more financial aid, emphasis on an education earns you more money – all emphasize to students, legislators, administrators, and the public the role money plays in education). These changes caused universities to focus more on their own agenda's rather than the public's (including neglect of helping primary and secondary schools and other societal problems), and to focus on their own customers (students and research funding sources). He ends by saying "we need a reaffirmation of the principles that the American university is an educational asset that can powerfully serve not only private, but public, purposes."

Reacting to Arizona's Changes: Have We Been Successful?

Both the state and the universities have completed studies that are useful to the issue of redesigning the universities.

The State

The State of Arizona has done a number of studies in the last 10 years related to strategic thought, key topical areas for investment, joint studies with universities for future needs, and had a series of committees address future related topics (see the above section on "Governor's Office).

³¹ Public Agenda. http://www.publicagenda.org/issues/pcc.cfm?issue_type=higher_education

³² Zemsky, Robert. Chronicle of Higher Education, 2003 (May 30). Have we lost the 'public' in higher education?

The Universities

The current structure of the universities allows them to be relatively flexible in addressing new approaches to higher education in Arizona. More details are available below and in the reports each university presented to Arizona University System Redesign Study.³³

1. Joint efforts with community colleges

NAU pioneered the 2+2 concept in Arizona, where a community college (Arizona Western College in Yuma provides the first two years) and a university (NAU) provides the second two years (similar agreements exist with the other community colleges). A student never has to leave Yuma and receives the bachelor's degree from NAU. This innovation is carried further by cooperation with the College of Agriculture and Life Sciences at the UA. CALS provides instruction in Yuma for the specialty agricultural areas, so a student using the 2+2 approach can get their degree from UA, but NAU and Arizona Western supply the non-major classes. In addition, all the universities work with community colleges on course transfers and ease of transfer with an AA degree to cover the general education requirements of the university. These university courses at Yuma are partly face-to-face instruction and partly electronic.

2. Off-site instruction (including e-learning)

The primary off-site instruction is through NAU, sites that include some face-to-face instruction, television, and web based instruction. In 2004 they assumed the management of Arizona Regents University (a cooperative effort of the three universities and ABOR to list all electronic courses available at a distance.

(<http://www.arizonaregentsuniversity.org/>).

3. Joint Degrees

There are several degrees offered jointly by two or more Arizona universities – where a student has a primary campus and advisor and takes courses from the other universities. Details are available at the Arizona Regents University web site. They include: Tri-University Master of Engineering, Tri-University Scholars Portal, ASU/NAU RN to BSN Program, and the ASU/NAU Secondary School Math and Science Teacher Preparation. In addition, there is an Tri-university AZTutor program for students enrolled (and working at a distance) at any of the three universities access to support services now only available to campus-based students

4. Joint Projects

Recent joint project include the Battelle Study sponsored by the Arizona Department of Commerce and the Arizona Board of Regents, the establishment of the College of Public Health (located at the University of Arizona) as the Arizona College of Public Health, the TGen, (Translational Genomics Research Institute) in Phoenix, and the expansion of medical programs in Phoenix (Phoenix Biomedical Campus of the Arizona University System³⁴, joint by ASU and UA with involvement of the Governor, City of Phoenix, and the Flinn Foundation). In late 2004 the Governor requested a Virtual Water University operated by the three state universities. Since 2003 the three universities have worked with the Arizona Educational Policy Initiative (located at ASU).

5. Joint Purchasing

The three university libraries cooperate in purchasing digital holdings to increase the cost effectiveness for the large digital libraries. The university purchasing departments cooperate on selected large purchases, and all universities use the State of Arizona purchasing system for appropriate product.

The ABOR and the universities have been making choices on a continuing basis about how they plan for the future. Those that are specific to each university and are especially relevant to redesigning the Arizona's universities are listed below.

³³ Profile and capacity reports from the three universities on current and planned activities are at the Arizona University System Redesign Study website: http://www.abor.asu.edu/special_editions/redesign/redesign_index.htm

³⁴ Memorandum of Understanding (including principles for design and development) for the Phoenix Biomedical Campus (2004) is at http://www.abor.asu.edu/special_editions/GLS%20MOU%20SIGNED%20VERSION%20re%20med%20ed%20in%20Phoenix%20080404.pdf

1. Arizona Board of Regents (ABOR)

ABOR Strategic Directions (from 2005-2009 Strategic Plan)

- Increase Student Participation in University Education
- Enhance the Quality of Student Education
- Increase Affordable Education for Students
- Provide an Educated, Competitive Workforce:
- Enhance Research and Impact Economic Development:
- Optimize University Resource Acquisition and Work Environment:

The “Changing Directions” policy³⁵ (2002) was launched because the universities were faced with rapidly increasing student enrollments and large cuts to university budgets. It is an on-going, multi-faceted initiative to reform the Arizona university system. The goals are to 1) Increase the affordability of higher education, 2) Improve the quality of the educational experience, 3) Respond to the workforce needs of Arizona, and 4) Stimulate the State’s economy by providing opportunities for economic development... Guiding principles cover 1) quality, 2) diversity, 3) specialization, 4) affordability, 5) accessibility, 6) student success, and 7) financial viability. This process relaxes the pressures for the three universities to follow the same rules in some areas (e.g. topical focus, admissions standards). The Changing Directions policy and its concept papers are relevant for issues relating to redesigning Arizona’s universities.

The Learner-Centered Education Initiative³⁶ (1999) began at a joint meeting of the Arizona Board of Regents and the State Board of Directors for Community Colleges of Arizona. ABOR began a series of discussions about learner-centered education, developed a grant system to the universities to study options, and was briefed by relevant activities on each campus, and approved definitions and guiding principles developed by the Arizona Faculties Council on learner-centered education. The result was a focus by ABOR to “anticipate that the universities will become more effective in meeting their traditional missions and additionally responsive to the needs of the New Economy and challenges for the 21st Century through LCE.”

2. Arizona State University

In 2002, ASU President Crow identified eight design principles for the new American university (president’s inaugural): Leveraging Place, Societal Transformation, ASU as Entrepreneur, Use-Inspired Research, A Focus on the Individual, Intellectual Fusion, Social Embeddedness, and Global Engagement. At the same time, he defined five reasons why the existing models of higher education are not appropriate for Arizona in the 21st century³⁷ 1) The Existing Models: The Gold Standard, 2) The Cultural Landscape of Arizona: A Frontier Heritage, 3) Sociological Determinants: Changing Demographics, 4) Economic Exigencies: Embracing Opportunity, and 5) Environmental Limitations: Sustainability and the Future of Arizona. To achieve the new American university, four guiding principles were identified: 1) Teaching is our prime directive, 2) Scholarship is the pathway to better teaching, 3) Creative expression in all forms is our highest goal, and 4) Openness and access to our learning environment. In 2004 ASU identified itself as “One University in Many Places: Transitional Design to Twenty-First Century Excellence.” The mission of Arizona State University is: “To provide outstanding programs of undergraduate and graduate education, cutting-edge research, and public service for the citizens of the State of Arizona with special emphasis on the Phoenix metropolitan area (each of the three Phoenix area campuses also has its own mission statement).” ASU is organized into four campuses (Tempe, West, Polytechnic, Downtown Phoenix).

3. Northern Arizona University

³⁵ Additional information on the ABOR Changing Directions policy is at http://www.abor.asu.edu/1_the_regents/initiatives/changing_directions/changing_directions.html

³⁶ More information on Learner-Centered education is at http://www.abor.asu.edu/4_special_programs/lce/abor-afc-lcprop_lce.htm

³⁷ Additional information on the ASU New American University and why existing models are not appropriate is at <http://www.asu.edu/ia/inauguration/address/>

NAU's mission is "Provide an outstanding undergraduate residential education strengthened by research, graduate and professional programs and a responsive distance learning network delivering programs throughout Arizona." In November 2004 ABOR outsourced the management of Arizona Regent's University to NAU, since the University's current Distance Learning operations are recognized for their well-established and highly effective delivery of baccalaureate to doctoral degree programs. In addition, partnerships continue to evolve such as the Northern Arizona University-Yuma branch campus shared with Arizona Western College. A new partnership with Yavapai Community College envisions expanding access for Yavapai students who want to pursue bachelor's, master's, and doctoral educational opportunities.

4. University of Arizona

In 2002 the UA began a program of "focused excellence." President Likins defined focused excellence as characterized by three essential elements: 1) Managed Growth, 2) Focus on fewer academic programs, 3) Prioritization based on excellence, which includes diversity, as the primary criterion for investment. This program will allow leveraging scarce resources and involve identifying selected programs for increased support, merger, or elimination³⁸. The mission of UA is: "To discover, educate, serve, and inspire." UA has a Tucson campus, which includes the Arizona Health Sciences Center, UA South (which has several campuses), and a small medical campus in Phoenix.

Assessing Where We Are

Looking to the Future as a Basis for Redesigning the Present

We are in a period of "transformation" of higher education and much of the future we are moving toward will be quite different from the past but much will remain familiar. This is hard to understand, because we have become accustomed to universities as they are today. While there have been some significant changes (e.g., many universities have gone from small, religious, privileged class enrollments to mixtures of teaching, research and service to students of all types), new models have been developed (e.g. Open University of United Kingdom, University of Phoenix), community colleges have evolved, and the number of higher education institutions approximates 4000 in the U.S. alone. Thus there has been tremendous change in the structure and students, but the most common method of instruction is still students going to a room at a particular time for a given number of weeks to hear a teacher lecture or engage in discussion few or many students. But we are approaching a more serious type of change and it will affect all of us.

What is different is the that we are facing a number of important factors at the same time, primarily due to demographic shifts, changes in financial sources, new technologies, and different methods of communicating and finding information and knowledge. We have been slowly reacting to these factors over the last few years; what has changed is the scale in each of them. What the specific future will be is unclear, and we need to have flexibility and a working radar system to navigate the changes as they come. But, we must be careful not to think that the past will be the future.

This difference in the future is critical for the Arizona University System Redesign Study to address.

Understanding the Future through Scenarios

A scenario paints a picture of what a particular future might be like. It considers a variety of trends and wildcards such as: Cost, Competition (research dollars, students, state funds), Enrollment growth (number, ethnicity, quality), Funding, Collaboration and partnerships, Engagement with State as state resource, Type of institution and mission, Organizational structure, and Role of faculty, students, administration, stakeholders. Scenarios build on ideas about how the future may unfold. See Exhibit 1 for a listing of some possibilities for ingredients when developing scenarios. An example scenario for Arizona Higher Education in 2020 is in Exhibit 2; other examples scenarios are in Exhibits 3 and 4.

³⁸ Additional information on the UA Focused Excellence is at <http://president.arizona.edu/initiatives/focused-excellence/>

Characteristics of a University System for Successful Navigation of the Future

What changes should we anticipate in our universities in planning for the future?

The times we are in have been described by several references above to be uncertain, tumultuous, transition, transformation, and paradigm changing. This is a condition that lends itself to developing a good foresight system to reduce the uncertainty of the future, and to organize and prepare for: focusing on what needs to be done, connecting with others, being flexible and agile. More examples include:

- Changes in how students learn, the type of student, and what they learn.
- Changes in how faculty teach, how faculty research addresses national and Arizona issues.
- Competition for student and research funds as well as state appropriation for higher education.
- Increased connectivity and communication of all types among all people
- Need for cooperation, partnerships, accountability, efficiency, and personalized attention to student's needs.
- Uncertainty on many of these issues and changes in current approaches in addressing these issues.

What guidelines might we develop to be successful at making these changes?

- The five guiding principles in the Redesign Scope of Work will always be with us – access, affordability, quality, effectiveness, and efficiency.
- The nine strategic issues of the Redesign Scope of Work (some are related to the guiding principles) also serve as a future guide – educational quality, access to education, economic feasibility, economic development, organizational changes, community college collaboration, efficiency, financing, and faculty resources.
- Following best practices developed for higher education and related fields that are applicable to higher education.
- Maintain appropriate traditional values and accept new values where appropriate.
- Reforms in major parts of the university, such as curriculum, missions, rewards.
- Recognize the learner of tomorrow will be different than the one we are accustomed to having.

What are the key attributes of a university structure to allow successful navigation of the future?

The university will embrace clear and transparent communication to/from are appropriate parties and have agility and flexibility in making and implementing decisions. The seven principles of a new university from Frank Rhodes, former president of Cornell University (partly public and partly private) indicate a successful university will:

- maintain institutional autonomy, lively faculty independence, and vigorous academic freedom, but will enjoy strong, impartial, public governance and decisive, engaged presidential leadership.
- be increasingly privately supported but increasingly publicly accountable and socially committed.
- be campus rooted but internationally oriented.
- be academically independent but constructively partnered.
- be knowledge based but student centered, research driven but learning focused.
- be quality obsessed but procedurally efficient.
- be professionally attuned but humanely informed.

The success factors for state government (from the National Governor's Association) apply to universities as well:

- Accountable
- Innovative; performance-driven
- Consumer-friendly
- Reinvented with technology
- Flexible and adaptable

Putting it All Together

We don't need a lot of study to realize that times are changing and both the state and the universities also changed.

However, if we know the future will be different from the past, we must take care that we don't just make old processes more efficient or add more of them; we should take better advantage of the multiple studies that exist on possible futures in Arizona and its universities, and prepare to handle the range of possibilities by taking new approaches where necessary and keeping traditional approaches where appropriate.

By looking at the data prepared through the needs assessment and adding some broader considerations, we should have a reasonable handle on what should be done, that is within the purview of the Board of Regents (this study does not address the changing role of community colleges or the private colleges within Arizona). Such considerations include:

- Identification and consideration of uncertainties and assumptions about future conditions and trends
- Debating the issues raised by books of previous university presidents and other studies of higher education
- Building on the studies previously completed related to the future of education in Arizona
- Using the recent changes in the three universities as a foundation for flexible and practical solutions
- Evaluating policy options to optimize the choice for any redesign of Arizona universities

Implications for the Redesign Study of Arizona Universities

There are five guiding principles and nine strategic questions identified in the Redesign Study Scope of Work. Just as important as matching various redesign proposals against the guiding principles and strategic questions is to identify assumptions or policies that should be evaluated. Two fundamental assumptions that appear to have been made serve as examples: 1) high anticipated future enrollment (past estimates for Arizona have been much higher than what actually occurred, and there is more uncertainty about making such projections today), and 2) that the basic structure and policies of the Arizona universities are not in question for the redesign (policy changes will be more important than the currently suggested moving of branch campus reporting arrangements). These assumptions may or may not be realistic.

This report was written in part to raise the question of policy options and assumptions. The implications of making any type of decision, including doing nothing, are significant. All parties will be affected: Arizona citizens, future students, faculty and staff, other institutions of higher learning, and the State in its role in the new economy.

Conclusions

1. Arizona can appear either as a modern progressive state or as one that ranks with the poorest states relative to social and educational indicators. Despite a generally good economy, average income per capita, good universities, and diverse and unique resources, we fall below our national comparators with respect to investment in education, student preparation for college, and high school graduation rates, even when comparing Arizona with states with lower economic growth rates. Having these two very different images of Arizona makes it more difficult to chart a path for the future of higher education.
2. Many of the higher education problems facing Arizona also occur in other states (for example, access, funding, quality) and we can learn from the successful approaches of others but need to account for Arizona's uniqueness (for example, our number of universities is low and the population is highly urbanized, and we have a high in/out population migration).
3. Arizona has a substantial number of relatively recent (in last 10 years) studies by a variety of groups that address needs and offer solutions to higher education issues. This provides a rich reservoir of material that would be useful to any redesign analysis for the universities.
4. It is widely recognized in higher education circles that big changes are coming and some essential elements of addressing those changes are becoming more clear (but a number of potential impacts, positive and negative, are still not clear). There may be a need to redesign Arizona's universities but the preliminary needs assessment presented in the redesign study does not make the case. Before anything major is done, it may be worth developing a Strategic Vision for all of Arizona Higher Education, based on the future needs and learning from the several Arizona studies. If we don't do the study properly now, it may be a long time before we do it again, and we will have lost momentum and perhaps directed resources in the wrong direction.

5. Arizona universities and the State of Arizona have made significant changes to address future issues, developing innovative approaches in some cases (e.g., 2+2 programs with community colleges, e-learning, and a mixture of branch campuses, changing directions documents, and joint programs). By taking an approach of “build on demand” coupled with the innovative approaches, there is still a lot of room for growth in students or programs. We also have to recognize a single model of higher education will not work for the entire state.
6. There are many possible solutions to the issues facing Arizona higher education. Simply moving boxes on an organization chart as proposed in the reorganization study (the original and most of additional proposals) is not one them. Many feasible solutions can be achieved without significant reorganization and requires only policy changes on the part of ABOR and the universities. Still other solutions may require significant changes. The current redesign proposals are not based on likely future changes in education, the range of anticipated needs, or possible options for choosing a path from among the several potential solutions... This is a mistake.

Exhibit 1. Observations about the Future

These organizations and individuals represent different approaches to understanding the future. Web addresses are given for further details. There are additional futures studies listed under Arizona and university studies.

Institute for the Future

These six trends are from their “Map of the Decade”; they occur with individuals, organizations, communities, markets, or households and daily life. Original material can be found at http://ifff.org/docs/SR-797_Map_of_decade.pdf (2003)

- **Emergence** -- top down control gives way to bottom up sophistication.
This increases unpredictable phenomena that occur when lots of individual actors following simple rules create complex behavior. This increases connectivity among people and how they interact with one another, direct link marketing and supply activities, and innovation is distributed.
- **The New Agency** -- trusted agents to self as agent.
Who acts on behalf of the individual, the organization or the community, and who assumes the risks and burdens? Consumers take on more risks in own decisions and are more engaged in these processes (so they are not just “customers”), the user defines what they want (individually customized), and energy production is distributed.
- **Shared Value** - value of proprietary ownership to value of shared interests.
Shared value is the increased value that information products and services acquire when they are held in common by players with diverse interests. Tasks are shared across different households, people develop their own media rather than using mass media, networking replaces hierarchies, organizations become “hybrid” models, and technology personalizes devices for the individual.
- **Focus and Fusion** - from virtual boundaries to embedded focal points.
In a distributed information world, the search for center, fuses with real places, comes to the foreground. Entertainment is developed by individuals and households, physical places fuse with virtual places. Consumers want simple messages not complex choices, and certain countries specialize in specific topics. Cross organization communication grows, and this changes how things are marketed.
- **Smart Presence** - from episodic interactions to persistent experiences.
Presence is defined by where you have been, such as digital tracks left behind by visitors to public places. There are more ways to do everything – stay connected, express yourself, monitor friends, processes, or places. The embedded society is immediate, always connected. Real time productivity monitoring of worker health, building health, product lifecycles. All this is from very small scale technologies that can be embedded in everything.
- **Health Values** - from traditional health care to a burgeoning health economy.
Health values are like family values – they provide a touchstone for all kinds of decisions in the home, in the workplace, and in the community. There will be more in-home health care using home health technologies, health is by a community of people focused on the individual, new health networks emerge through employers, schools, insurers and retailers. A focus will be on healthy places and healthy spaces, and traditional health care will be a part of this but augmented. More responsibilities will fall to companies rather than government. Finally technology mimics biology as to possibilities (e.g., tissue scaffolding for replacement skin, neural net programming, bones as models for helmet materials).

Global Business Network

From the book “Inevitable Surprises: Thinking Ahead in a Time of Turbulence”, by Peter Schwartz.

<http://gbn.org/ArticleDisplayServlet.srv?aid=14200> (2003)

"Most organizations and most people assume that the world in front of us is basically continuous—that tomorrow is basically going to be pretty much like today," he said. In fact, the opposite is true: We live in a time of perpetual

discontinuity, a time in which bombshells and shockers are part of everyday life. "The surprise," explained Peter, "would be no surprise." These examples were selected from the book by GBN (see site above).

- **Nearing the end of retirement** – Americans are not retiring and are working at some type of job.
- **Continuing high-growth economy is inevitable** – caused by productivity driven by new technology and globalization.
- **We're moving toward a new world order** – the world is organized into three groups: disorderly countries (chaos is rampant), orderly (traditional industrialized regions), and the United States (which makes the rules but does not play by the rules).
- **We are in the first stages of another scientific revolution** – revisited view of how the universe works; reinvent our understanding of the large scale, the small scale, the chemical, the biological.
- **Polluting technologies get clean** – with the pace of technological change, high growth equals clean, low growth equals dirty.
- **Abrupt climate change is coming** – the long period of climatic stability may be ending.

Selected Excerpts of Studies Indicative of Emerging Trends

These excerpts are taken from recent sources that indicate some of the changes underway. Formal trends take time to identify and thus indicators of emerging trends are useful. While you have to be careful to avoid temporary fads, the points below are sufficiently likely that they are used as examples of anticipating the future.

- **The Future of Work** -- The future will be less about what technology can do and more about what we want to do with technology. Will that technology be used primarily to boost economic efficiency, or will it also be made to serve a broader set of human interests and values? Organizations that do the later will attract the most desirable knowledge workers and be more effective and efficient in the long run. – *Thomas Malone, Author of The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style, and Your Life. Source: Global Business Network (2003).*
- **Redefining the Enemy** -- Increasingly we are at war not with enemy states or enemy armies but with small groups of people or with specific individuals: fugitive terrorists, drug traffickers, warlords, dangerous dictators, rogue scientists. Yet powerful institutional barriers to fundamental change remain. In the armed forces, there is still a tendency to view the current situation as an anomaly – as the “other war” as opposed to the “real war,” as missions to be consigned to specialized units rather than to main forces, as opportunities to gain valuable field experience but not a compelling argument to radically alter how we organize to fight. We adapt incrementally. Given our great strength, that may suffice. But one wonders. It is nowhere written that we will win. *Source Rand Corporation, Rand Review (2004).*
- **Smart Mobs: The Next Social Revolution.** – The ingredients are RF Chips, wireless internet nodes throughout buildings and neighborhoods, using individual’s personal computers for collectively searching for extraterrestrial intelligence, buying and selling on the internet, instant text messaging and friends’ mailing lists used for convening meetings of people outside your own circle. The action is people who are to act in concert even if they don’t know each other. The individuals operate in ways that were never possible, because they carry devices that possess both communication and computing capabilities. These participants will coordinate actions with others around the world, and with people nearby. Groups of people using these tools will gain new forms of social power, new ways to organize their interactions and exchanges just in time and just in place. (text paraphrased). *Source. Book on Smart Mobs by Howard Rheingold (2003).*
- **Complexity and the Economy** – When viewed in out-of-equilibrium formation, economic patterns sometimes simplify into the simple, homogeneous equilibria of standard economics. More often they are ever-changing, showing perpetually novel behavior and emergent phenomena. Complexity therefore portrays the economy not as deterministic, predictable and mechanistic; but as process-dependent, organic and always evolving. *Source. W. Brian Arthur, Santa Fe Institute (1999).*
- **Energy Transitions.** -- In 2001 Shell Oil developed two scenarios to contrast an evolutionary progression from coal to gas to renewable (or nuclear) against the potential for a hydrogen economy. The scenarios have five

common features: 1) the important role of natural gas as a bridge fuel over at least the next two decades and the importance of reducing supply security fears, 2) the strong pressures and volatility which oil markets will face as new vehicle technologies diffuse, 3) the shift towards distributed or decentralized heat and power supply for economic and social reasons, 4) the potential for renewables to be the eventual primary source of energy and the importance of robust energy storage solutions, and 5) the difficulty of identifying winning services or technologies in a period of high innovation and experimentation. Source: *Shell (2001)*.

- **“Five Meta-Trends Changing the World”** -- The Futurist July-August, pages 22-27. Pearce defines these meta-trends as “evolutionary, system-wide developments arising from the simultaneous occurrence of a number of individual demographic, economic and technology trends.”
 1. **Cultural Modernization** – Largely as a result of economic globalization, “Cultural Modernization will continue to assault the world’s traditional cultures, provoking widespread political unrest, psychological stress, and social tension.”
 2. **Economic Globalization** – There will be long-term economic benefits from globalization in both developed and less developed nations, the short-term disruptions in local domestic employment will make free trade an ongoing political issue that will be manageable only so long as domestic economies continue to grow.
 3. **Universal Connectivity** – As the first marketing medium with a truly global reach, the Internet will also be the crucible from which a global consumer culture will be forged, led by the first global youth peer culture.
 4. **Transactional Transparency** – Various groups will take advantage of the global (communications) infrastructure to document socially and environmentally abusive behavior by both private and public enterprises...”There will be skulduggery, bloodshed, and heroics before total transparency finally becomes international law – 15-20 years from now.”
 5. **Social Adaptation** – The forces of cultural modernization – education, urbanization, and institutional order – are producing social change in the developed worlds as well as in developing nations.
Source: *David Pearce Snyder, The Pearce Family Enterprise (2004)*

- **Characteristics of the Future – Anticipating the Future Course**

Certain characteristics emerge when looking at these focal themes in the context of the strategic issues and emphasis areas. They are the threads that cross all other factors and will help shape many of our activities.
<http://cals.arizona.edu/futures>

 1. **Globalization and Regionalization** - The world is more interdependent through the economy, trade, and marketing because of ease of access through travel or internet. While keeping national culture and local options, nations (or regions or cultures that are dispersed among many locations) become part of the world as a whole and thus require world-wide efforts at governance, treaties and collaborations.
 2. **Individual and Group Focus**

Increasingly people will want both personal service (rather than generic relationships) and ways of obtaining products or services that are unique to the person requesting it. At the same time, there is a need to work together to address common issues/problems; working together could be through small teams or collaboration with other organizations. This changes the relationship of the organization to the individual, as employee or as customer..
 3. **Sustainability** - Sustainability is likely to be the next defining era (like technology defines our current era). It is pervasive through all driving force topics and is generally defined as doing something today with the long term perspective in mind so you are able to continue doing it a long time without burdening future generations. Topical examples include strategic planning, workforce development, life long learning, health, security, infrastructure, spending/investment, building/maintenance, and organizational behavior.
 4. **Complexity and Simplicity** - Everything is getting more complex, with more choices, and people look for simplicity. Some solutions are indeed simple, and some new technologies can take the complexity and hide it, so the solution appears simple. Both simplicity and complexity are likely to be guidelines for the future.
 5. **New Approaches and Tools.** – We have a toolbox of devices to help us address issues raised by all driving forces, with many more tools and approaches yet to be discovered. Dealing with the unfamiliar is both exciting and worrisome and different people and institutions deal with the change in different ways. Conflicts in these different approaches exist and need to be worked out. Often the solutions will be ‘hybrids’ where you have some of the older ways and some of the newer, each bring it’s particular strengths to the solution.

Exhibit 2. Scenario: Arizona Universities Transformed (2020)

Note: this scenario is written from the perspective of 2020 and is an example; it is not necessarily representative of the large variety of possible futures - to do that would require 4-5 scenarios or more. The basics of this scenario were originally developed in 2001 (for 2010) from a discussion of possible changes in the Arizona universities as identified by the ABOR staff. It has been updated and modified for this report.

Although there have been studies and reports about the “transformation” of higher education for years, they began to be taken more seriously in the late 1990s. By the early 2000s, there was a critical mass of people who realized that indeed there was to be a transformation and the early warning signals were not only clear, but they also provided some ideas of what we might expect.

It took about 5 years of both frivolous and serious debate among faculty, administrators, students, and governing board members plus special studies for Arizona to prepare to make some serious choices. Since the primary changes were put into place in 2006, we now have 14 years of experience and have made remarkable progress. Our choices in the system redesign effort of 2005 and the additional changes made in 2010 were good ones. The farsighted nature of those changes was confirmed during the recession/mini-depression of 2009-2011, resulting from the large national debt, high negative trade balance, and delayed revisions in Medicaid financing. The Arizona universities were able to withstand the impacts due to the safeguards and contingency plans in place.

There were three major changes that set us on this new path: 1) revising an obsolete budgeting and incentives structure that rewarded the wrong things, 2) adoption of a system-wide strategic vision for 2020 based on the a learner-centered environment (which fits on the back of a business card so everyone remembers it), 3) restructuring system policies that provided more cooperation among the state universities and built alliances with other institutions, 4) a growth plan for addressing increasing enrollment by expanding the 2+2 community college/university program, and 5) the increased e-learning opportunities tied with the recognition that a course is a course, regardless of how it is taught (on- or off-campus, by us or by others, for a semester or some other time period, and taken by individuals or as teams). The way of life in the state was changing too, with the American Indian’s now controlling a majority of the state’s water rights and the increased growth rate of the Hispanic population (which grew 53% from 2000 to 2015 compared to only 20% for Arizona’s overall population, causing all Arizona universities to be come Hispanic Severing Institutions in 2011).

We now have a relatively unique approach to strategic partners for the Arizona University System and how we work together as the state’s four universities. These partners include the state university system, the community college and preK-12 systems, two Mexican universities, two private universities, two non-governmental organizations, and the State of Arizona. In addition we have strategic alliances with 25 businesses/industries, allowing mini-sabbatical leaves for both faculty and staff from the university and allowing staff from the industries to be at the university. We also have a modernized version of the historic student internship and study abroad programs. The State of Arizona’s involvement was facilitated by the 2008 Research Applied to National and State Needs Program (RANSN) of the National Science Foundation (a slightly revised version of the NSF sponsored Research Applied to National Needs program that was in place from 1969 to 1977). We could build this arrangement because Arizona was large enough to have problems and small enough to do something about them, building on a pretty good (but under funded) post-secondary educational system. Few other states could match that combination of factors.

But, it is how we used this strategic partnership that allowed us to leverage our resources and target specific disciplines and their interactions that turned out to be highly relevant today. That leveraging, coupled with our learner-centered approach to management has allowed the state to keep two major research universities and also have other research universities. Of course, we partly took advantage of the highly sophisticated electronic course modules (that began in simplistic version in the mid-1990s) and the credit banking agency. The credit banking agency, a subsidiary of the International Consortium of Accrediting Commissions, allows all courses at accredited higher education institutions to be transferred freely among the globe’s educational community, with full credits and grades, at no additional cost to the student (each university can decide which courses are relevant for transfer). Some of us never thought we could pull that off, as each university has historically considered their own courses as superior to everyone else’s.

The solutions to our problems facing us in 2005 are fun to talk about, now that the transition has been made. By about 2010, there were so many electronic courses that students and universities cooperated in determining which courses were the most appropriate to take by e-learning (or course by that time we did categorize the different types of learning). These generally included the “general education” or service courses and the specialty courses (since each campus was more focused on fewer subject areas, these specialty courses filled important gaps). Other policy choices included holding the percentage of out of state students to the historic California value (10%), changing the CLEP (College Level Examination Program) policy to make it uniform for all Arizona universities and to allow students to study on their own and test out of up to 30 units (25% of all requirements), while getting credit and a grade in the process. With this improvement in offerings and use of electronic courses, the classroom of the past became a place for small group discussions between students and faculty, and students and students. The partnerships with business, industry and government provided new opportunities for students (and freed up space on the campuses because at any one time 10% of the students were working with a partner institution and another 10% were taking nearly a quarter of their classes via e-learning methods. By providing more state financial aid (due to a revision in the Arizona tax structure), more students were able to go to school full time and thus graduate more quickly.

“Hybrid” learning opportunities (both e-learning and face-to-face learning) along with improved efficiencies in graduation rate allowed many more students to be educated within the same basic infrastructure that existed 15 years ago (2005) when Arizona set in motion many of the designs for the current university system. In fact some individual campuses were able to reduce their enrollment size, to attain a 30-35,000 range for a more optimum educational experience and to accommodate the range of activities common to modern state universities.

With the role of classrooms and the mix of classes changed, the library also changed. Following 5 years of negotiating agreements, the Arizona Digital Library became a reality in 2012. This ADL served all the library needs for Arizona (universities, community colleges, public schools, public libraries, and individual citizens). Different costs for different levels of service and access, of course, vary among these different types of users. Since there are now 15 states doing a similar approach to library services, there is some redundancy in case any one center suffers from a data loss; to address this Arizona has agreements with two other states as emergency providers. The actual library has changed markedly, with it looking more like a coffee café ringed with private and group study areas and seminar rooms. It reminds one of a combination of the old coffee houses and places of intellectual stimulation of 100 plus years ago and the historic (and current) method of some European universities of students meeting with faculty to discuss what they have learned on their own. This was possible because books were largely replaced by electronic downloads to e-books, where you can carry at least 50 books in electronic form for the weight of a 1990s paperback, use a highlighter for organizing high interest information into other formats, and still get the feel of “reading a book” rather than a computer screen (one of the great innovations was making an e-book have the look and feel of a real book).

When the state established the Arizona Virtual Water University in 2005 (after the Governor’s request for the virtual university caused a mini-war when the universities were still in a competitive mode rather than a cooperative one) -- in fact, that turned out to be the tipping point in the universities re-learning they were a state resource and had public obligations rather than what some thought were elitist ambitions to be high in their academic rankings. It also started a long series of similar cooperative efforts on a range of topics.

In the end, the universities changed because the times changed. The digital age significantly impacted much of the learning and support infrastructure. The university’s reactions to more competition for students and research funding helped focus priorities. The Board of Regents policy shifts found in the “changing directions” document allowed program flexibility. Legislative funding methods allowed budgeting flexibility. These factors gave the universities both the tools and the reasons to change and they responded well. As a result, the universities were able to increase efficiencies, improve student learning, and help the state address its problems. It was what the people back in the 2000 era would have called a “win-win” situation.

Some other states were not so lucky. They were unable to gain cooperation from the key parties and continued outdated funding and assessment methods for their state universities until the only practical choices made change costly and difficult.

Exhibit 3. Six OECD Scenarios for Higher Education

From: *The Future of the Tertiary Education Sector: Scenarios for a Learning Society*, Organization of Economic Cooperation and Development (2003). Tertiary education is community college/university. Full report at: http://www.simul-conf.com/oecd_japan/documents/Future_of_universities.pdf

The OECD was formed in 1960 and now has 30 member countries (including the U.S.) that share a commitment to democratic government and the market economy. With active relationships with some 70 other countries, NGOs and civil society, it has a global reach. Best known for its publications and its statistics, its work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation.

Scenarios about Higher Education (using Europe as the source) to stimulate thinking about the future of American Higher Education. These are the specific scenarios. The full report is 31 pages and has driving forces and background material leading up to the scenarios.

The six variables selected for constructing the six scenarios are: 1) the type of population covered by tertiary education, as well as correlated variables; 2) the nature of funding (predominantly public, mixed, predominantly private); 3) the integration of missions offered; 4) the international dimension of the system, 5) the homogeneity of status of faculty and institutions, and 6) the degree of take-up of e-learning. A matrix of issues vs scenario is in the full report.

The six scenarios are the following.

Scenario 1: Tradition

Universities are mostly like today, catering to a relatively small share of the youth population for the purposes of job selection credentials. Universities pursue both teaching and research, as now, without excessive dependence or involvement with the private sector. Governments continue, in most OECD countries, to play a prominent role in funding, regulating and managing universities. Within a public accountability and equity framework there is little scope for profit-generating initiatives and the international dimension of the university "market" is modest. Lifelong and e-learning both develop largely outside of the university sphere.

Scenario 2: Entrepreneurial universities

Selective institutions cater largely to young people in their initial preparation for life. The key difference with the previous scenario is the strength of market forces in the sense that universities (public or private) can respond with greater autonomy to a variety of funding sources. There is a more mixed public-private funding model, with university resources coming from a wide variety of sources. Along with the returns to the intellectual property rights that it secures, research is seen as very important and lucrative activity. However, in this scenario universities take a market-oriented approach to operations without losing basic academic values. Given the prestige and income accorded to research the teaching side remains quite elitist. As for lifelong learning it occurs within a university setting but in teaching only institutions with lower status. The three missions of the university – teaching, research and community service – are well balanced, although there is greater differentiation across institutions due to enhanced autonomy and greater responsiveness. Commercial approaches to international markets and e-learning are important. University resources as well as wages and prestige of academic staff improve. Links to the local economy are strong.

Scenario 3: Free market

Market forces are the main drivers of this scenario with a private tertiary sector regulated by private companies as far as quality assurance and accreditation are concerned and mostly funded through market mechanisms. Market forces give rise to institutions that become specialised by function (teaching, research), field (business, humanities, etc.), audience (young students, part-time students, distance education, adult education, lifelong learning) while business firms grant degrees to their employees for their corporate training. Hierarchy between those very diverse institutions becomes very strong, with the apparition of a global super-elite, and more polarisation in the status of faculty. With the widening of student choice there is greater competition for students and tuition revenue comes to represent a more important share of overall income. Technology is widely used in teaching methods. The international dimension of the market becomes important. And, since the majority of students and their parents are not interested in research, refusing to bear the costs, research moves out to public research centres and corporate R&D divisions. What research remains in universities becomes even more elitist while teaching to mass markets leads to greater standardisation and the patenting of curricula and teaching methods. Research becomes more demand-driven, specialised and secures important returns through intellectual property rights.

Scenario 4: Lifelong learning and open education

Universities are marked by universal access for all ages and much less research. The knowledge economy has flourished and higher education becomes a source for recurrent professional development financed by companies, individuals seeking recognised skill upgrading, and states. In an ageing society, more elderly people enrol for nonprofessional reasons. Universities become more learner- and demand-oriented, more teaching oriented, with short courses, more distance learning, and more e-learning. Governments or independent accrediting bodies are responsible for quality assurance and accreditation. Most research is done outside of the higher education system, with the best researchers moving to private companies, specialised institutes or the few remaining elite universities. Corporations and corporate universities have a large influence. Integration with the applied side of learning might go so far that all university education would follow the professional school model. Responsiveness to market forces is high in this scenario and there is considerable business oriented investment in e-learning.

Scenario 5: Global network of institutions

Post-secondary studies become demand- and mostly market-driven. The two main innovations are 1) that learners define their own course of study from across all available courses throughout the global post-secondary education network and design themselves their degrees; 2) that higher education institutions partner increasingly, including with industry. E-learning develops strongly in this scenario, as well as other means of education. The training content becomes more standardised and possibly embedded in technology and media (e.g. modular learning objects or edutainment through partnerships with game industry). The provision of and market for lifelong learning becomes very large, especially as education takes a multiplicity of new forms. Most research is carried out outside the higher education system, and faculty in mostly teaching institutions becomes less qualified than today but use more sophisticated teaching techniques. There is a strong polarisation in the status of academic, with academic superstars and developers of “learning tools” getting high status whereas the average teaching staff becomes less qualified and gets lower status. Programmes and courses matter more than institutions. Intellectual property rights for substance as well as for teaching methods give high returns to their owners.

Scenario 6: Diversity of recognised learning

In this scenario, the formal tertiary education sector disappears. People learn throughout their life, at work, at home, for personal and professional motivations, more and more by themselves and by sharing their expertise with other people interested in the same field. Professional education requiring hands-on practice, like surgery, etc., is transmitted within businesses through an apprenticeship system or thanks to new sophisticated electronic devices. Technology is an enabler for the diffusion of information. People learn as much and possibly more than today but in a different way: learning takes the model of “open source” education, mostly free and non commercial, involving a lot of partnerships between individuals and institutions of all sorts. Global networking is thus important and goes beyond institutions. Knowledge and experience acquired in all life situations are acknowledged through formal assessments of credentials carried out by specialised assessment bodies. But given its pervasiveness, knowledge is less of a determinant for a career or in the stratification of society. While research becomes less specialised in fields requiring little money, like humanities or mathematics, a large share of research requiring high investments takes place in public research centres and in corporate R&D divisions.

Exhibit 4. Seven Scenarios from the Higher Education Futures Project

These abstracts were developed from the scenarios at The Futures Project at Brown University web site (futuresproject.org – find them by looking for “scenarios” in the publications category. The original scenarios are 5-7 pages, give factual background, look at possible outcomes, and list a series of questions. There were developed in 2000-2001 to serve as discussion tools about possible futures in higher education. The first three describe a hypothetical State of New England. Additional perspectives are in the book describing the final report and the project web site: <http://www.futuresproject.org/>

1. *Dwindling Hope: Merit Aid Widens the Gap (2000)*

After initially resisting the use of merit aid in the state aid program, the public institutions found themselves much less able to compete for tuition paying high-achieving high school graduates. The private institutions became engaged in a price war among themselves. After two for-profit out of state universities petitioned to grant degrees, the state began to offer merit aid.

2. *The Rise of the Consortia (May 2000)*

It seems likely that the number of consortia providing research collaborations, degrees, and particularly now virtual education will grow, creating a whole new level of competition in higher education.

3. *New Providers Help Build a Skilled Workforce (2000)*

New methods were developed for student aid to virtual and for-profit institutions. The Continuing Education divisions of the public universities developed partnerships with several large employers to develop certification courses for the skills their employees need. A community college petitioned to become a public corporation to become free from complicated regulations and to better serve their corporate customers. New methods were investigated to prohibit diploma mills located in other states from offering substandard virtual courses. Increased businesses because of a more educated workforce moved to the state and attracted more students, offsetting the initial enrollment loss in the traditional universities and colleges to the new educational options.

4. *Raising the Bar: A P-16 System Aligns Standards (2000)*

All high school graduates will be guaranteed a place in college within the state college system. New high school graduating standards were established, software developed for remedial math courses and that remedial course will not be offered at any four-year institution. Teacher preparation and development was accomplished by the Virtual Professional Development School Consortium – offering a combination of online and face-to-face instruction aimed at K-12 teachers. The state college system began offering virtual Advanced Placement courses, and high-performing university students served as mentors and tutors to selected high school junior and seniors through the New England Scholars Outreach.

5. *The US-Mexico Case (2000)*

The Mexican Association of Universities and Higher Education Institution (ANUIES) developed a proposal to reform Mexico’s higher education system for the 21st century. Two colleges, one in Ciudad Juarez and one in El Paso) coordinated their efforts through the Consortium of North American Higher Education Collaboration (CONAHEC), located in Tucson, Arizona. After initial concerns about the difficulties of offering joint degrees, accreditation, and credit transfers, they found some potential solutions for international higher education collaboration, with governmental financial support, but they are still working on trying to get a joint degree program started.

6. *Contracting for Accountability (2000)*

The state contracts to the public universities for services and the former university appropriation process was phased out. The contract formula involves enrolment, graduation rates, and some expenses related to the on-campus socialization of students. The university had to agree to an assessment of learner outcomes and to disseminate all information regarding student performance to the public. The university research continues to be primarily federal, but a state fund is available to the public universities on a competitive grant basis. There is a funding mechanism for outreach activities to apply university research and expertise to community issues. The community colleges are kept as state institution with traditional funding, and the former flagship state university reconstitutes itself as a public corporation.

7. *In Search of the New Economy: Encouraging Private Competitors to Fill the Demand for Skills (2001)*

Starting from the basis of a new country (Globalya), it developed a combination of for-profit institutions, non-profits, and branches of existing universities from other countries. The privates offered selected subjects rather than an extensive curriculum. Due to a budget shortfall, annual budgets for public universities were cut and scholarship programs for private universities were cut. Initial plans to offer courses by the internet were scrapped because of too limited of an infrastructure in the country. The previous reputations of the foreign universities increased their enrollments and the public universities enrollment dropped.

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