STATUS OF DOCTORAL EDUCATION IN ARKANSAS

An Arkansas Department of Higher Education Report to the
Arkansas Higher Education Coordinating Board

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INTRODUCTION

As demands for a more advanced workforce increase, the relationship between higher education and economic success is more recognized by leaders in both academia and economic development. As Larry Walther, Director of Arkansas Department of Economic Development, stated in a recent presentation to the Blue Ribbon Committee on Higher Education, "Education is the key to economic development."

Arkansas is 17 years behind the rest of the country in movement away from its dependence on manufacturing. There are dozens of reasons for this lag, but always at the top of the list are education and workforce skills. For most of us, workforce development is typically a product of associate- and baccalaureate-level education; however, there is an abundance of information that indicates doctoral education and the research and development (R&D) that frequently accompany it are equally vital to a strong state economy.

Which states are in the best position to take advantage of growth in the new economy? According to the 2004 Milken Institute's New Economy Index that ranks each state based on 12 criteria critical to future technology growth, Arkansas is 49th. The criteria include research and development dollars, the population's percentage of advanced degrees, number of patents issued, venture capital investment, business starts, and proceeds from IPOs (Initial Public Offerings of stock) among others. The Institute indicated that Arkansas ranked last in the index primarily because it ranked last in education. At least 50% of the indicators are directly tied to education. In addition to the Milken index, other similar national rankings generally place Arkansas at or very near the bottom.

The purpose of this report is to provide a useful context for Coordinating Board members as they consider new doctoral program proposals and develop further strategies for the delivery of doctoral education in the state. Since the moratorium on doctoral programs expired in January 2003, the Coordinating Board has considered and approved the Doctor of Public Health (DrPH) at UAMS. Based on letters of notification and discussions with graduate faculty and staff across the state, the ADHE staff expects to receive six to eight doctoral proposals over the next few months.

Section 1 of the report presents information concerning the important relationship between graduate-level education and economic development. It includes what is being said nationally about the relationship of doctoral education research and development (R&D) and economic development as well as comparisons of economic indicators between Arkansas and peer states. As designated in the

report, peer states include Mississippi, Kentucky, West Virginia, and Oklahoma based on population and economic factors. With the exception of West Virginia, these states are also among Arkansas' strongest competitors for business recruitment and expansion.

Section 2 of the report presents doctoral program information specific to Arkansas public higher education institutions including mission differentiation, state general revenue expended on doctoral programs, and criteria currently used to review new doctoral program proposals. The report concludes with a brief review of relevant reports prepared by statewide working groups over the past decade.

SECTION 1. ARKANSAS ECONOMIC DEVELOPMENT

There is no longer a debate--the United States has entered a new economic cycle in which knowledge and the processing of information are key to success. History notes that in past economic shifts, one predominant sector generally replaced another as when agriculture declined and industry emerged. The new knowledge-based economy is different in that old sectors have not been replaced; they have been revolutionized.

Employees adept in knowledge-based environments have become corporate assets and are paid accordingly. While earning disparities are caused by various reasons, the relationship between earnings and education continues to intensify as shown in Table 1. The impact of these earnings on individuals is significant when viewed as career earnings and is exponentially multiplied when considering the educational attainment and corresponding economic wealth of an entire community or state.

Table 1.
Educational Attainment and Earnings Potential

Education Level	Annual Income	Career Earnings (in millions, 1999 dollars)
High School Dropout	$23,400	$1.0
High School Diploma	$30,400	$1.2
Associate's Degree	$38,200	$1.6
Bachelor's Degree	$52,200	$2.1
Master's Degree	$62,300	$2.5
Doctoral Degree	$89,400	$3.4
Professional Degree	$109,600	$4.4

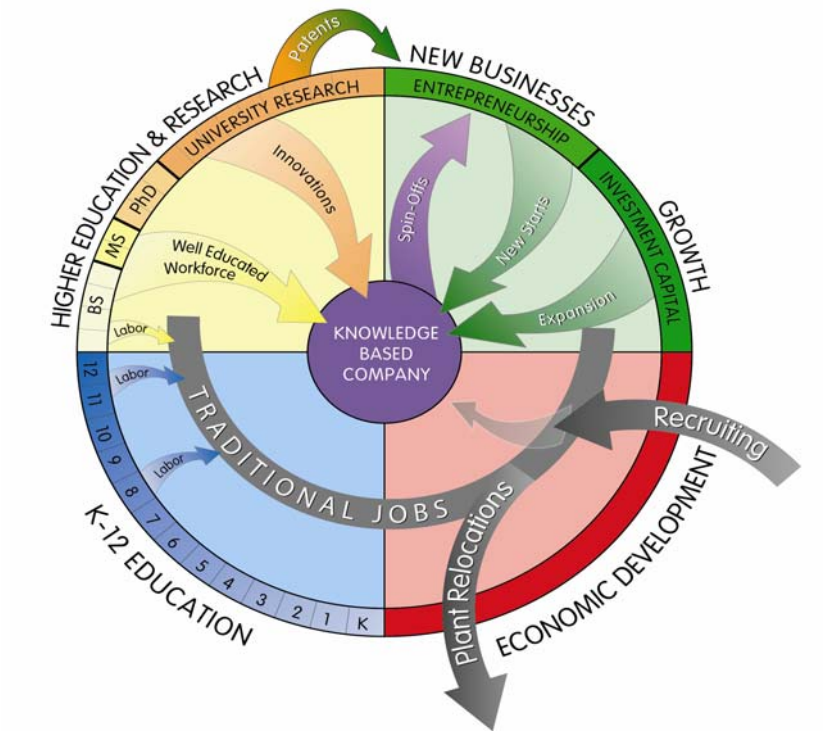
(Source: American Council on Education. (2002). *Facts in Brief: Economic Benefits of Higher Education Continue to Grow.*)

The creation of knowledge-based jobs is complex and multi-dimensional process that includes a mix of policy, planning, and practice. However, at its core is the need for a highly skilled, analytical, and flexible workforce.

A state's readiness to compete in the new economy can be calculated. The Progressive Policy Institute has provided the structural foundation for the new economy and ranked each state according to its achievements in various components. These components measure the presence of knowledge jobs, globalization preparedness, economic dynamism, elements of a digital economy, and innovation capacity. Of the fifty states evaluated in 2002, Arkansas ranked 48th, ahead of peer states Mississippi (49th) and West Virginia (50th) and behind Kentucky (42nd) and Oklahoma (34th). Arkansas' results are fully detailed in Appendix A.

Arkansas policymakers have recognized that higher education is the main leader in generating scientific and technological breakthroughs and in preparing workers to meet the evolving demands for skilled labor. The importance of higher education in economic development was illustrated in a 2002 report issued by the Arkansas Task Force for the Creation of Knowledge-Based Jobs. (See Figure 1 below.)

Figure 1.
Knowledge-Based Economic Development Cycle



Source: *Report of the Task Force for the Creation of Knowledge-Based Jobs*. (2002).

As indicated in the illustration, while individuals with associate's, baccalaureate, and master's degrees provide labor for a well-educated workforce in both traditional and knowledge-based companies, it is research at the doctoral level that drives the creation and expansion of knowledge-based companies. Higher education and research produces innovative workers who acquire patents that result in entrepreneurial start-up and spin-off companies. As clusters of these companies are formed, the economic landscape begins to change from traditional to knowledge-based. The importance of this cycle becomes clear with data indicating that two-thirds of recent national growth stems from the expansion of knowledge-based businesses.

Graduate Education and Economic Development

States that are thriving in the new economy are using graduate programs to generate scientific and technological breakthroughs through research and development (R&D) activities. They have seen that R&D drives the application and creation of knowledge which in turn increases regional and national competitiveness and further innovation. According to Alan Greenspan (2000), states that have not been able to develop technologies and jobs that fuel economic growth must increase their R&D levels and improve the infrastructure that supports R&D.

A recent state technology and science index issued by the Milken Foundation (2004) stated:

> *Places that can attract, grow and retain firms and industries proficient at deploying information technology, in addition to producing it, will be at a competitive advantage. The degree to which a state's knowledge assets are harnessed and converted into scientific innovations, products, and services determines its economic future.*

Arkansas ranked 49th in the nation on this index in 2004, up from the rank of 50th in 2002.

The economic impact of university-based research was summarized in a 2000 RAND report. It stated that when "the locations of federal laboratories and major federally funded R&D activities at universities are mapped with the locations of high-technology start-up companies, the ripple effects of federal R&D investments on regional and local economies become clear."

Strong graduate programs are necessary for creating knowledge-based jobs because they create R&D opportunities. These programs attract high-quality faculty researchers and graduate students who in turn attract external R&D

funding for cutting edge research. Furthermore, strong graduate programs encourage the cross-fertilization of knowledge and ideas between university and industry researchers, collaborations that will create a new culture that supports continued innovations and discoveries. This cycle perpetuates itself through the creation of stronger bodies of work that foster additional innovation and knowledge-based enterprises.

Research performed by university scientists and engineers is important because it drives the innovation that makes a knowledge-based economy possible; yet, R&D is expensive and few institutions can afford to bear the cost alone. Research program costs are supplemented in a variety of ways, but the most common is through Federal research grants that support faculty and general operating costs.

The Integrative Graduate Education and Research Traineeship (IGERT) program is one important way that the Federal government supports R&D. Through IGERT, the National Science Foundation (NSF) provides funds to universities for research assistant stipends to support researchers in emerging multidisciplinary areas of science and engineering. The value of the IGERT program is evident. It supports almost 50 percent of all science and engineering research assistantships and 25 percent of all fellowships; research support that would not be possible if student stipends were the financial responsibility of local institutions. These percentages are even greater in the physical and biological sciences and chemical engineering.

The National Institute of Health (NIH) and NSF sponsor most of the science and engineering graduate students whose primary support comes from the Federal government. NIH and NSF fund 16,000 and 14,000 students, respectively.

Arkansas R&D

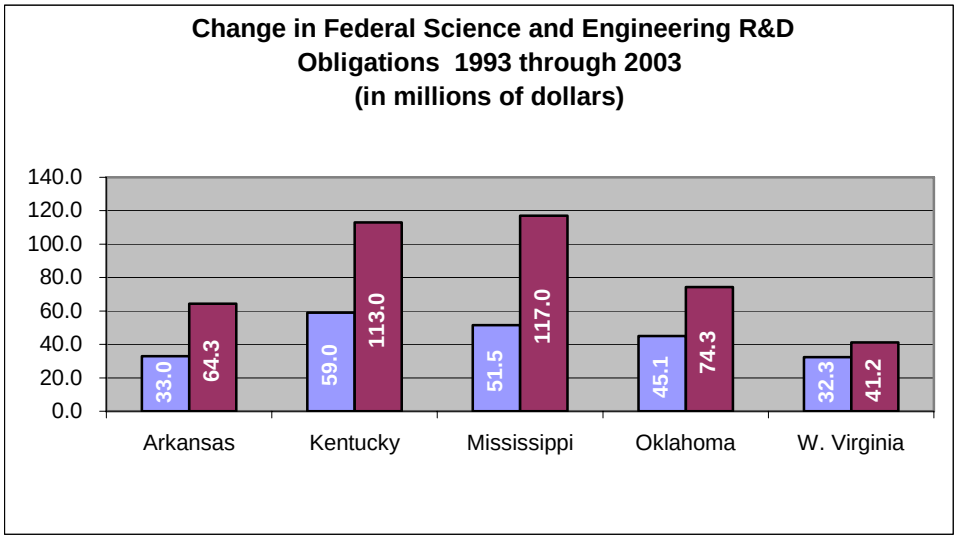
Indicators of a state's R&D activity frequently include Federal science and engineering R&D obligations, R&D expenditures per capita, the number of Ph.D. scientists and engineers in the workforce per capita, and patents awarded. Measures relative to Arkansas in each of these areas follow.

- Federal Science and Engineering R&D Obligations

  Arkansas researchers and university administrators have made Federal R&D support a top priority and their efforts are paying dividends. The state nearly doubled the amount of Federal support received for science and engineering R&D between 1993 and 2000 and federal support accounted for more than 75% of total budgeted R&D expenditures. Mississippi and Arkansas had the highest percentage increases in this category at 127% and 97%, respectively.

While these results should be celebrated, it is sobering to note that 81 individual U.S. universities received more Federal R&D support than the state of Arkansas as a whole. Comparisons with selected peer states can be seen in Table 2.

Table 2.



(Source: National Science Foundation. (2002). *Federal Science and Engineering Support to Universities, Colleges, and Non-Profit Institutions: Fiscal Year 2000.*)

Arkansas' $64.3 million in R&D Federal obligations (FY2000) was distributed among six of its universities. Table 3 shows the distribution of Arkansas R&D funds to higher education institutions and Arkansas institutions' rankings among 1,515 institutions nationwide. In addition, Table 4 shows the amount of Federal funding received for research equipment.

Table 3.
Distribution of Arkansas R&D Funds
(FY2000)

Institution	Funding Received	Ranking
UAMS	$32.1 million	127
UAF	$21.6 million	128
UALR	$ 7.3 million	232
UAPB	$ 2.9 million	253
UCA	$ 331,000	637
ASU	$ 70,000	N/A

(Source: National Science Foundation. (2002). *Federal Science and Engineering Support to Universities, Colleges, and Non-Profit Institutions: Fiscal Year 2000.*)

Table 4.
Amount of Funding for Research Equipment
(FY2000)

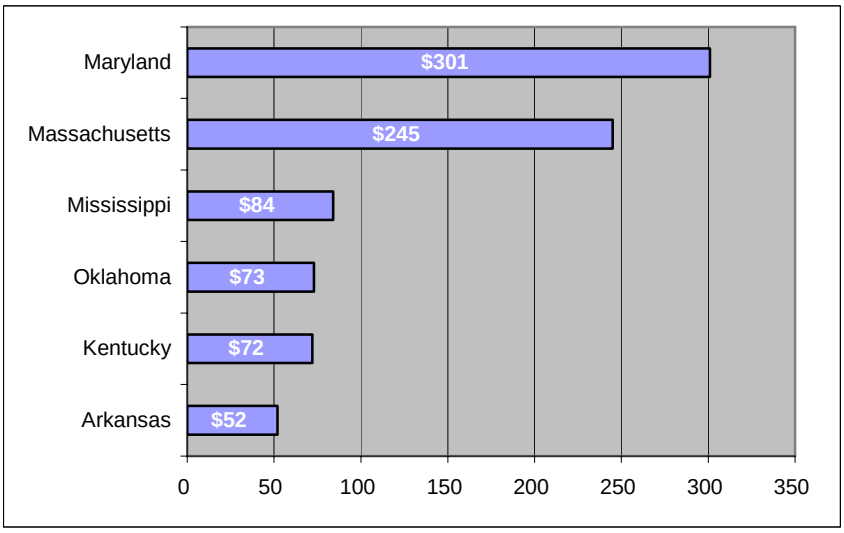
Institution	Amount for Research Equipment
UAF	$5.9 million
UAMS	$1.5 million
UCA	$205,000
UAPB	$ 95,000
ASU	$ 5,000

(Source: National Science Foundation. (2002). *Federal Science and Engineering Support to Universities, Colleges, and Non-Profit Institutions: Fiscal Year 2000.*)

- Arkansas R&D Expenditures Per Capita

  Another key indicator of R&D activity is total R&D expenditures per capita. While Arkansas increased its total R&D expenditures per capita 2.9% from 2000 to 2002, it still ranked 43rd of the 44 states for which data was available. Only South Dakota posted lower expenditures. Comparisons with states leading this category (Maryland and Massachusetts) and Arkansas' peer states clearly illustrate that there is a shortfall in R&D expenditures per capita in Arkansas. (See Table 5.).

Table 5.
R&D Expenditures Per Capita
FY2001



(Source: National Center for Higher Education Policymaking and Analysis (2002). *Research and Development Expenditures*. www.higheredinfo.org/.)

- Other R&D Indicators

Arkansas consistently ranks near the bottom in overall Federal R&D obligations, a situation partly attributed to the fact that it also ranks at the bottom in the number of Ph.D. scientists and engineers in the workforce. The Progressive Policy Institute New Economy Index included state rankings related to Ph.D. scientists and engineers as shown in Table 6.

Table 6.
State Ranking of Civilian Scientists and Engineers as Percentage of the Workforce (2002)

State	Rank
Arkansas	48
Kentucky	47
Mississippi	45
West Virginia	39
Oklahoma	36

(Source: Progressive Policy Institute. (2002). *New Economy Index.)*

Successful R&D efforts can also be measured by the amount of university-industry technology transfer that occurs. Technology transfer is when research findings are translated into commercial applications.

A research institution must be effective in technology transfer, not only for the potential monetary gains, but also to attract and retain the best and brightest faculty. Competence in university-industry technology transfer is an increasingly important asset in state and regional economic development.

One commonly used measure to gauge university-based technology transfer activities is the awarding of U.S. patents. Although a portfolio of patents might not indicate all technology transfer that occurs at an institution, it is indicative of a proactive approach. The Progressive Policy Institute's New Economy Index includes a ranking for patents issued by Arkansas and its peer states as shown in Table 7.

Table 7.
State Rankings for Patents
Issued Per 1,000 Workers
(2002)

State	Rank
Arkansas	49
Mississippi	48
Kentucky	45
West Virginia	43
Oklahoma	33

(Source: Progressive Policy Institute. (2002). *State New Economy Index.*)

Section 1 Summary

Arkansas has actively tried to increase R&D activity since the creation of the Arkansas Science and Technology Authority in the early 1980s. (See Appendix B, Arkansas Research Activity Milestones). There have been some successes, but the state still lags behind the rest of the nation. The indicators tell a consistent story--Arkansas is not prepared for the new economy.

The creation and support of knowledge-based companies is multi-faceted, but it is clear that they cannot thrive without university research programs. States that are thriving in the new economy use their graduate programs to generate scientific and technological breakthroughs and to capitalize on the ripple effects with more innovations and spin-offs.

SECTION 2. DOCTORAL EDUCATION IN ARKANSAS

The history of graduate education in Arkansas mirrors that of many states, with the University of Arkansas, Fayetteville (UAF) initially designated as the only institution that offered post-baccalaureate degrees. Due to geographical and resource constraints, UAF later began offering doctoral programs in the sciences to students at University of Arkansas for Medical Sciences (UAMS) and a practitioner-oriented Ed.D. program at the University of Arkansas at Little Rock (UALR). These off-campus programs were designed to use qualified faculty from each of the respective campuses.

Doctoral program proliferation and associated institutional role and scope changes became contentious issues in the early 1990s. UALR sought a change in role and scope to offer the Ed.D., sponsored by UAF on the UALR campus. UAMS wanted to do likewise with the doctoral programs offered by UAF at UAMS and it also wanted its own Ph.D. in Nursing. During this same time, Arkansas State University in Jonesboro (ASUJ) and the University of Central Arkansas (UCA) requested changes in role and scope to allow for the offering of doctoral degrees as well. In light of these significant requests, the State Board of Higher Education (SBHE) asked for a state report on graduate education to be conducted by external consultants. The report was issued in November 1991 and all requested changes in role and scope were eventually approved by the SBHE (later know as the Arkansas Higher Education Coordinating Board or AHECB).

In late 1999, ADHE staff received notice of six new doctoral proposals that would be forthcoming and once again became concerned about the direction of graduate education in the state. In February 2000, AHECB directed ADHE staff to conduct a second study of state graduate education needs and the use of limited resources to meet these needs. This report was presented to AHECB in July 2000, and its recommendations were adopted, including a moratorium on new doctoral programs at Arkansas public universities, that extended to January 2003. For a summary of the 2000 Graduate Report, see page 23.

A complete timeline of events related to doctoral education can be found in Appendix C.

Types of Doctoral Degrees

The 2000 doctoral education review team employed by AHECB, differentiated between types of doctoral degrees based on their orientation and focus. According to the review team, the two primary types are the research doctorate and the practitioner/professional doctorates.

- Research Doctorates (Ph.D.)

  Research doctorates are designed to prepare research scholars who are capable of operating independently and in collaboration with other scholars to advance the knowledge base of their discipline. Strong research doctoral programs recruit students nationally and internationally and attract those who tend to enroll directly from an undergraduate or master's program.

  Research doctorates are usually employed in academic or research positions and do not typically become involved in the application of their discoveries. However, in the past several years, some Ph.D.'s have been developed that are broader in nature and include a more applied focus. These programs have a concentration on research, but do so in a way that emphasizes both applications and theory in the discipline.

- Practitioner/Professional Doctorates (Ed.D., DPT, Dr. PH)

  Practitioner/professional doctorates provide the highest level of academic education with the goal of placing students directly into a professional environment. Graduates of these programs have a very high level of knowledge on the practitioner side of the discipline. Students enrolled in practitioner/professional doctorates frequently are currently employed, enrolled part-time, and are residents of the institution's geographical area. Their objective is to gain the knowledge and credential that will create better employment opportunities in a narrowly defined field.

Arkansas has both research and professional doctoral programs at its five doctoral-granting institutions. Research-based Ph.D. programs are located at UAF and UAMS. Ph.D. programs that include a more applied focus can be found at ASUJ (Environmental Science and Heritage Studies), UALR (Applied Science), and UCA (School Psychology and Physical Therapy). Professional doctoral degrees are offered at UAF (Ed.D.), UALR (Ed.D.), ASUJ (Ed.D.), UAMS (Dr.PH), and UCA (DPT). See Appendix D for a complete list of doctoral programs by institution.

When considering doctoral education in Arkansas, it is helpful to look at information from other states as a point of comparison. Table 8 shows the population, number of four-year institutions, number of doctoral institutions, and the number of doctoral degrees awarded in 2000-01 by peer state.

Table 8.
Public Institutions and Doctoral Degrees Awarded by State

	State Population	Four-Year Institutions*	Doctoral Institutions*	Doctorates Awarded*
Arkansas	2,673,400	11	5	144
Kentucky	4,041,769	8	2	361
Oklahoma	3,450,654	11	3	504
Mississippi	2,844,658	9	6	332
West Virginia	1,808,344	9	2	132

*Includes medical schools
(Source: U.S. Census Bureau; U.S. Department of Education, NCES; state statistical reports)

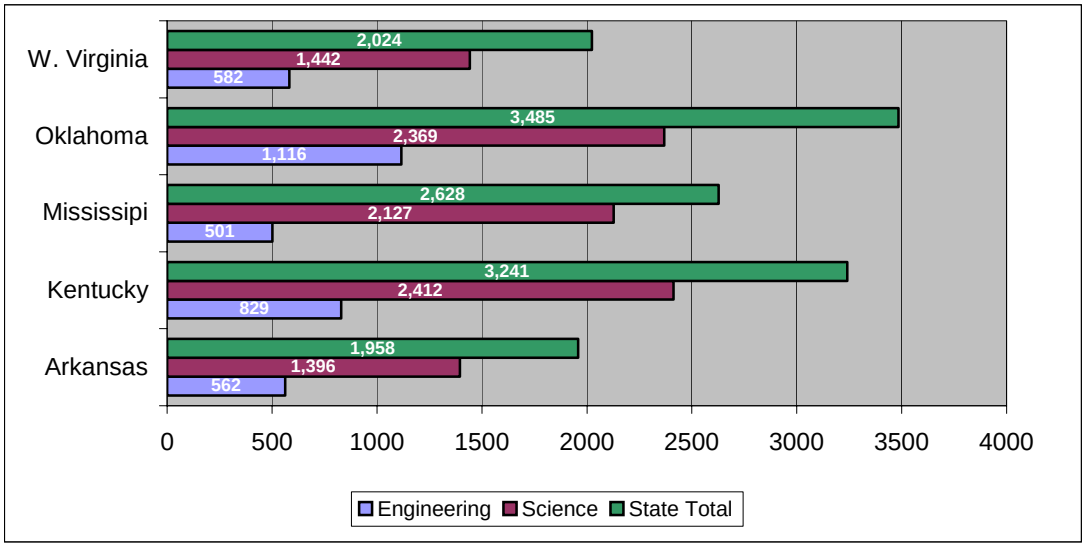
As seen in Table 8, Arkansas is in the top two of the peer states in terms of number of four-year institutions and doctoral institutions, but next to lowest in terms of state population and doctorates awarded.

Graduate Student Support of R&D

The number of doctoral degrees awarded in a state is important, but even more important are the types of degrees being granted and the number of students in the pipeline to fulfill the state's needs. If the key to the new economy is knowledge-based industries dependent on R&D, then resources needed to support R&D become important.

One critical resource in R&D is a pool of science and engineering students available to assist faculty. As seen in Table 9 below, Arkansas has the fewest number of science and engineering graduate students among its peer states. A detailed list of science and engineering graduate students by peer state and institution can be found in Appendix E.

TABLE 9.
Science and Engineering Graduate Students by State
FY2000

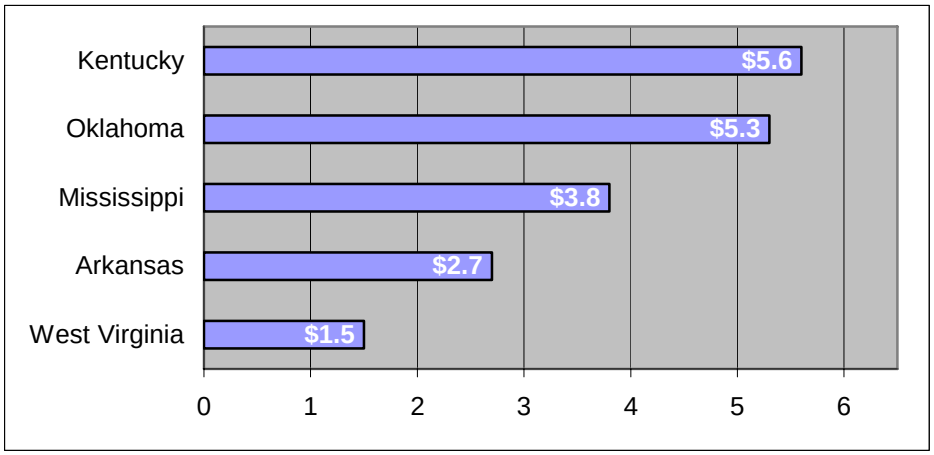


(Source: National Science Foundation. (2002). Federal Science and Engineering Support to Universities, Colleges, and Non-Profit Institutions: Fiscal Year 2000.)

Strong research-based graduate programs offer students the opportunity to earn nationally-recognized doctoral degrees and strong doctoral programs attract larger numbers of graduate students.

Doctoral programs, doctoral students, and accompanying R&D attract Federal support for research assistantships, fellowships, and other training grants. In 2000, Arkansas received $2.7 million. As seen in Table 10, only West Virginia with $1.5 million attracted fewer Federal dollars for research assistance.

Table 10.
Federal Support for Fellowships, Traineeships, and Training Grants
FY 2000 (in millions)



(Source: National Science Foundation. (2002). Federal Science and Engineering Support to Universities, Colleges, and Non-Profit Institutions: Fiscal Year 2000.)

Institutional Role and Scope

Enabling legislation for each public institution in Arkansas established its purpose, role, and scope. As higher education in the state has evolved, mission statements as well as the role and scope of institutions have changed. The most notable changes have been UALR and UAFS, both established as private junior colleges. UALR has evolved into a public doctoral-granting institution and UAFS recently moved into the public baccalaureate ranks.

Changes in role and scope raise the issue of "mission creep" as indicated through national (Carnegie) or regional (SREB) classification systems. A general explanation of each classification system follows.

- The **Carnegie Classification of Institutions of Higher Education** is the generally accepted classification system of American colleges and universities and is the framework in which institutional differences in U.S. higher education are commonly described. Because of its emphasis on institutional "functions," the classification is seen as differentiating colleges and universities with respect to mission.

  U.S. News and World Report utilizes this classification system to organize its college rankings, some governmental bodies use it to make funding decisions, some foundations use it to target funds, and campus officials use it to identify peer institutions for comparison purposes. Some perceive it as a ranking system and adopt "moving up" the classification as a goal.

  Currently, 3,941 institutions are classified in the broad categories of Doctoral/Research (Extensive and Intensive), Master's (I and II), Baccalaureate (Liberal Arts, General, and Baccalaureate/ Associate's), Associate's, Specialized, and Tribal Colleges and Universities.

- The **Southern Region Educational Board (SREB) Classification** system was developed to categorize member institutions so that statistical comparisons could be made among the 16 member states.

  Categories are based on factors relevant to determining resource requirements including size (FTE enrollment), role (types of degrees), breadth of program offerings (number of program areas in which degrees are granted), and comprehensiveness (distribution of degrees across program areas).

  Institutional categories include Four-Year (1 through 6), Two-Year with Bachelor's, Two-Year (1 through 3), Technical Institute/College (1 and 2), and Specialized.

Under the Carnegie Classification, institutions can offer a limited number of doctoral degrees and still remain at the Master's level. The SREB Classification system differs in that a four-year institution at any level (1 through 6) can offer a limited number of doctoral degrees. For a complete listing of Carnegie and SREB Classification criteria, see Appendix F.

Table 11 shows the current Carnegie and SREB classifications of Arkansas public institutions. Arkansas is the only SREB state that does not have a Four-Year 1 institution. UAF moved from the Four-Year 1 to the Four-Year 2 classification due to a drop in the number of doctoral degrees awarded. It is expected that UAF will regain its Four-Year 1 designation when SREB classifications are revised in 2005.

Table 11.
Carnegie and SREB Classifications of
Arkansas Public Institutions

Carnegie Classifications	**SREB Classifications**
Research-Extensive UAF	**Four-Year 1** N/A*
Research-Intensive UALR	**Four-Year 2** UAF
Master's I ASUJ ATU HSU SAU UCA	**Four-Year 3** ASUJ UALR UCA
Master's II N/A	**Four-Year 4** N/A
Baccalaureate-Liberal Arts N/A	**Four-Year 5** ATU HSU SAU
Baccalaureate-General UAM UAPB	**Four-Year 6** UAM UAPB
Baccalaureate/Associate N/A	**Two-Year 1** N/A
Associate's Colleges ANC ASUB ASUMH ASUN BRTC CCCUA EACC MSCC NPCC NAC NWACC OTC OC PCCUA PTC RMCC SACC SEAC SAUT UAFS UACCB UACCH UACCM	**Two-Year 2** ANC ASUB NWACC PTC UAFS
	Two-Year 3 ASUMH ASUN BRTC CCCUA EACC MSCC NAC NPCC OTC OC PCCUA SACC SAUT SEAC RMCC UACCB UACCH UACCM

*Arkansas is the only SREB state that currently does not have an institution classified as Four-Year 1

Based on the number of degrees currently being produced in graduate programs across the state, Letters of Notification, and new program proposals received by ADHE staff, it is expected that most Arkansas four-year public institutions will change Carnegie and/or SREB designations in the near future. A description of expected changes for each institution follows.

- ASUJ — Change in Carnegie Classification from Master's I to Doctoral Research Intensive in 3-5 years based on the number of doctoral degrees awarded.
- ATU — Change in SREB Classification from 4-Year 5 to 4-Year 4 based upon maintaining current level of degrees awarded and programs offered for two more years.
- HSU — Change in SREB Classification from 4-Year 5 to 4-Year 4 based upon maintaining current level of degrees awarded and programs offered for two more years.
- SAUM — No changes expected in next 3 years.
- UAF — Change in SREB Classification from 4-Year 2 to 4-Year 1 in 1-2 years based on number of doctoral degrees awarded.
- UALR — Change in SREB Classification from 4-Year 3 to 4-year 2 in 3-5 years based on the number of doctoral degrees awarded and the number of disciplines offering doctorates. The discipline requirement will be met if AHECB approves the three new consortium programs that are in the pipeline (Ph.D. in Communication Sciences and Disorders with UAMS and UCA; Ph.D. in Informatics with UAMS; Au.D. in Audiology with UAMS).
- UAM — Change in both Carnegie (Baccalaureate-General to Master's II) and SREB (4-Year 6 to 4-Year 5) Classification based on the number of master's degrees awarded. UAM currently meets the higher requirement for SREB and should meet the higher requirement for Carnegie within three years.
- UAPB — Change in Carnegie Classification from Baccalaureate-General to Master's II in 1-2 years based on the number of master's degrees awarded.
- UCA — Change in Carnegie Classification from Master's I to Doctoral Research Intensive in 3-5 years based on the number of doctoral degrees awarded and the number of

disciplines offering doctorates. The discipline requirement will be met if AHECB approves the new consortium program in Communication Sciences and Disorders offered with UAMS and UALR.

See Appendix G for detailed descriptions of each institution's current classification and criteria for moving to the next level.

Cost of Doctoral Education

One of the most critical issues in doctoral education is cost. Research-based Ph.D.s are more costly to establish and maintain than practitioner/professional doctoral programs.

Essential elements of a research Ph.D. that incur cost include faculty with strong publication records; faculty time designated for research, student supervision, and mentoring; and research facilities (labs), equipment, and library resources that create a research environment. In short, expansion of a discipline's knowledge base through the production and publication of original research is expensive.

Practitioner/professional doctoral degrees are less costly to develop and sustain because they usually do not require the resources needed to support the development of new knowledge. However, in some instances, practitioner/ professional programs can be equally expensive because of the cost of clinical components.

New information has been released regarding instructional costs at four-year institutions. The ***Delaware Study of Instructional Costs and Productivity***, a recently published report mandated by Congress, sheds new light on an old topic. The report focused on direct instructional cost per student credit hour from 1998-2001 and included the following findings.

- **Most of the variance in instructional cost across institutions is associated with the disciplinary mix within an institution.** It is possible to examine two doctoral/research universities, one that emphasizes the physical sciences and one that emphasizes the social sciences/humanities, and find substantial differences between overall instructional costs at the two institutions.

- **A secondary factor affecting cost is institutional mission as it relates to Carnegie institutional classification.** It is possible to examine a research university and a baccalaureate college, each focused on the social sciences and humanities, and find no difference in overall instructional costs.

- 60-75 percent of the variation in cost within a discipline is associated with volume of teaching activity (SSCH production), department size in terms of number of faculty, and the proportion of faculty holding tenure.

- Across almost all disciplines, the **level of teaching activity, as measured by total undergraduate and graduate student credit hours taught, has the highest or second highest contribution in predicting cost.**

- Although the highest degree awarded in a discipline had a relatively small impact on institutional costs, **doctoral instruction in biology, chemistry, and physics increased cost by nearly 10 percent on average.** However, at non-doctoral institutions, some physical science disciplines are only marginally more expensive than social science departments.

The Delaware Study can have a significant impact on the way we evaluate the relative expense of doctoral education. Results from this extensive research project consistently indicate that program cost is driven more by discipline than by level of degree.

State General Revenue and Arkansas Doctoral Programs

Arkansas has not calculated direct instructional costs by program level using the Delaware Study methodology. However, ACA 6-61-222 requires AHECB to publish the *Arkansas Academic Cost Accounting: Uniform Reporting of Educational and General Revenues and Expenditures and Academic Productivity* ("Uniform Reporting") report, which focuses on total revenues, direct and indirect expenditures, and general revenue subsidy by academic department and program for each Arkansas public college and university.

Data from Uniform Reporting indicate that the state's investment in doctoral education is nominal when compared to overall expenditures. In 2001-02, two-year and four-year institutions reported total direct and indirect instructional expenditures of $921 million. Of this total, $394 million (43 percent) was state general revenue subsidy. The distribution of state general revenue (SGR) by program level is shown in Table 12.

Table 12.
Distribution of State General Revenue for Instructional Costs by Program Level*
(in millions)

Program Level	Total Expenditure	SGR Subsidy	% Expenditure SGR Subsidy	% SGR Total Subsidy
Undeclared	$158.1	$ 60.6	38%	15%
Certificate/Associate	230.6	110.6	48%	28%
Baccalaureate	452.2	185.1	41%	47%
First Professional	14.7	4.7	32%	1%
Master's	53.0	27.2	51%	7%
Specialist/Doctoral	12.1	6.2	51%	2%
Total	$ 920.6	$394.4	43%	

*Does not include UAMS due to its non-formula status. A general estimate of state general revenue subsidy for UAMS is $6.0 million for graduate education.
(Source: Arkansas Department of Higher Education. (2003). *2001-02 Arkansas Academic Cost Accounting: Uniform Reporting of Educational and General Revenues and Expenditures, and Academic Productivity.*)

The proportion of instructional expenditures subsidized by state general revenue is highest for graduate programs at 51 percent. However, of the $394 million in state general revenue used for instruction, only $6.2 million (2 percent) was allocated to specialist/doctoral programs.

See Appendix H for the number of degrees awarded by level.

Doctoral Proposal Review Process

ADHE staff engage in an extensive review process when new doctoral program proposals are received. Currently, there are two members of the Academic Affairs staff that coordinate all doctoral review team activities. These two staff members have several years of experience in graduate education program review and the preparation of review team reports.

Factors that determine the type of review undertaken include the nature of the program (interdisciplinary from existing programs vs. the creation of a new program with all new courses) and type of program (practitioner/professional program with curriculum prescribed by an accrediting body vs. programs with no standard prescribed curriculum).

Proposed interdisciplinary doctoral programs from existing degrees and programs with a standard prescribed curriculum are usually reviewed by one out-of-state expert in the field of study. As a general rule, site visits are not necessary for these types of proposals and the review process is 3 to 6 months.

New doctoral proposal reviews that involve the creation of a new program with new courses or one in which there is no standard prescribed curriculum generally

take 6 to 9 months to complete, but they can stretch into years if extensive program revisions are required. The process for these types of doctoral proposal reviews is as follows:

1. Initial staff review of the proposal. ADHE staff contacts institutional representatives for additional information if needed.

2. Institutions are asked to recommend 6-8 professional colleagues appropriate for possible inclusion as consultants on a review team.

3. ADHE staff contact potential review team members. The individuals contacted are asked to submit a curriculum vita and to disclose any relationship that they have with the institution(s) proposing the program.

4. Up to three team members are selected on the basis of their breadth and depth of knowledge in the program area and their availability. One team member is selected to chair the group.

5. ADHE staff forwards to the team all program materials and a list of key questions that must be answered in the final report.

6. ADHE staff schedule a team conference call. The team discusses any concerns it has about the proposed program. If necessary, staff requests additional information from the institution and forwards it to team members.

7. A 2-day site visit is scheduled unless it is concluded that the proposal needs significant revision. (If revisions are required at this time, the proposed program review ends.)

8. ADHE staff accompany the team on the site visit. Team members meet with program faculty and administrators, tour facilities, and gather information needed to draft a thorough team report.

9. Draft team report is reviewed by ADHE staff.

10. Report finalized by team and submitted to ADHE staff for consideration.

11. Final copy of the team report is sent to the institution proposing the program for written comments and response.

12. ADHE staff base their program recommendation to AHECB on need and demand for the program, appropriateness of the curriculum, faculty experience with doctoral programs, and willingness of the institution to commit adequate resources for a sound program.

State Reports Related to Doctoral Education

In-state commissioned groups and out-of-state experts have made several recommendations related to graduate education since 1991. A summary of findings and recommendations related to doctoral education from each report can be found below.

1) Observations on Graduate Education in Arkansas (1991)

This report was prepared by external reviewers from the University of Oklahoma, University of Wisconsin-Oshkosh, and Texas A&M University and was intended to examine and evaluate policies for the state's new master plan. The reviewers stated that the investment in doctoral programs at UAF must be protected and enhanced. Furthermore, they said that persuasive arguments could be made that the "well-being of the state requires doctoral programs in regions other than the northwest corner, to facilitate accessibility by citizens to doctoral programs in as many locations as it needs and can afford." Reviewers recommended a "cautious but deliberate development of doctoral education at ASUJ and UALR" and stressed that funds intended for existing UAF doctoral programs should not be diverted elsewhere.

2) Arkansas Research and Development Plan: A Strategic Plan to Guide Arkansas into the 21st Century (1996)

In 1994, a task force of state leaders was appointed by the Governor to develop a strategic R&D plan for Arkansas that would complement federal and university research agendas. Recommendations pertinent to graduate education included:

- Increase research opportunities for high school and undergraduate students, and increase the investment in graduate research support.
- Encourage collaborative efforts in research and education.
- Encourage the recruitment and retention of productive research scientists at all institutions.
- Provide matching funds for major R&D grants and contracts.
- Increase the number of doctoral graduates in science and technology by providing incentives and interdisciplinary programs.
- Recognize the different needs of R&D as compared to classroom education.
- Include R&D components as criteria for higher education productivity.

Suggested areas for R&D priority included Advanced Materials (structural materials, adhesives and coatings, recycling); Agriculture, Food, and Life Sciences; Biotechnology and Bioengineering; Environment; Manufacturing Systems; and Transportation and Logistics.

3) <u>AHECB Graduate Report (July 2000)</u>

This report was prepared by external reviewers from the Ohio Board of Regents, Oklahoma State University, and Colorado State University to assist in determining the needs of the state in terms of graduate education, specifically at the specialist and doctoral levels. The team met with selected legislators, state officials, business leaders, and AHECB members. As a result of the report, AHECB adopted 17 resolutions including one that enacted a moratorium on the consideration of doctoral program proposals from July 2000 to January 2003. The moratorium was established to allow the Coordinating Board time to consider a number of national reports scheduled for release in which Arkansas was expected to fall near the bottom. Reviewers concluded that:

- Despite the long-term importance of doctoral programs to the economic future of the state, its short-term priorities should be in improving access to higher education and in strengthening science and engineering programs at the associate's, bachelors, master's, and graduate certificate levels.
- A case can be made that students need commuting access to practitioner/professional doctoral degrees, but not research doctorates.
- Cautious development of new initiatives can be productive by developing doctoral offerings that are collaborative across departments or institutions.
- The direction of doctoral education for UALR, ASU, and UCA should focus on statewide collaborative efforts.
- UAF should undergo an external review of its existing doctoral programs to consider whether the program mix can be optimized.
- Selected areas of research excellence that will have a local economic impact should be nurtured.

4) <u>Priming the Pump (November 2000)</u>

This UAF 2010 Commission report focused on the impact of research dollars invested in the state of Arkansas. It indicated the following:

- An investment of $1 per capita in R&D produces a long-run real return of $8.02 in per capita personal income compared to a U.S. average of $5 return for the same $1 per capita in R&D.

- The average annual rate of return (compounded) a research dollar would yield over 10 years in Arkansas is 23.2% compared to 7.9% for a general investment in Arkansas higher education.

5) Making the Case: The Impact of the University of Arkansas on the Future of the State of Arkansas (2001)

There are two key points in this 2010 Commission report—Arkansas must produce more college graduates and must invest more in its research universities. The report demonstrates that research universities contribute markedly to economic productivity in states where state, federal, and private support match the needs of statewide communities. A major vision component of the UAF strategic plan is to become a nationally competitive research university with the support of federal, state, and corporate research funding.

6) Report of the Task Force for the Creation of Knowledge-Based Jobs (2002)

The Task Force for the Creation of Knowledge-Based Jobs was appointed by the Director of the Arkansas Department of Economic Development as part of Opportunity Arkansas, an effort to develop a state economic development strategy. The group concluded that knowledge-based companies must be created and grown from university research that leads to entrepreneur businesses and spin-offs. The report reviewed the Milken Institute's New Economy Index and indicated that on almost every ranking, Arkansas is near the bottom. Recommendations included the following:

- Elevate math and science education to the number one public education issue.
- Establish an independent study panel to recommend better ways to allocate the state's higher education budget.
- Support research as a tool for economic growth and focus research matching funds by establishing no more than six Centers of Excellence (biotechnology and medical technology; information technology; agriculture and food sciences; agricultural medicine; bioinformatics and computational biology; and nanomanufacturing and photonics).

7) Doctoral Education at the University of Arkansas, Fayetteville (2003)

Based on recommendations from the 2000 Graduate Education Report, AHECB directed ADHE staff to review the doctoral programs at UAF to assess the need for the programs. Two of the external reviewers for this

report had served on the 2000 Graduate Education Report team. The report included the following observations:

- While there may be some demand for service-oriented graduate programs at other institutions in the state, the population of the State and the resources available for higher education dictate that the locus of investment in research and research-oriented doctorates should remain at UAF (and in defined fields at UAMS).
- UAF appears to have an appropriate mix of doctoral programs.
- The internal program review and improvement processes should be strengthened.
- UAF does not have the resources needed to accomplish its mission in doctoral education.
- The State should give the greatest possible attention to improving UAF's resource base.

The complete team report and a response to the report from UAF can be found in Appendix I and Appendix J, respectively.

CONCLUSIONS

The demands on higher education have never been greater. Our colleges and universities are expected to provide a skilled workforce, solve problems that exist in K-12 by creating a seamless P-16 system, and increase graduation rates. The state has been focused on undergraduate education for more than a decade and progress has been steady, yet small.

Knowing that a skilled workforce advances economic development, Arkansas has worked hard to provide higher education access to thousands across the state. The investment has been substantial and we expect that the long-term payoff will be substantial as well. Yet, in the short-term, we have not been able to close either the education or economic gap between Arkansas and neighboring states.

The Southern Growth Policy Board has indicated that policies of southern states often do not support activities that are part of the New Economy Index, particularly research and development. Moreover, the Policy Board asserts that this lack of policies to support R&D is one of the primary reasons that the south is lacking in premier research universities. A 2002 report published by the State Council of Higher Education for Virginia (SCHEV) reiterated this point when it stated:

> *In recent years, our colleges and universities have operated in an environment that has not always supported research. Whether implicitly or explicitly, many state higher education policies have*

sent a message to the colleges and universities: An institution's research mission is secondary to its instructional mission; undergraduate students are a priority over graduate students; and investments that produce immediate returns and are low-risk are preferable to longer-term, potentially more risky ventures.

Within the higher education community, the question becomes one of balance and opportunity-cost. Evidence of the benefit of strong doctoral research programs has been presented; the people of Arkansas clearly understood this concept when they voted to provide research facilities and fund research programs with proceeds from the Tobacco Settlement Fund. This money will be used to support research programs that would have been impossible in the past.

The need is just as great for doctoral education in some professional fields of study which are not research-based in the traditional sense. Arkansas institutions are experiencing faculty shortages in professional fields and are having to create doctoral programs to grow their own instructors. Furthermore, some professional organizations are raising the minimum education required for practitioners to the doctoral level, which will force the master's programs in these disciplines to propose the doctorate or close the program. Other professional doctoral programs will be needed because they are in high demand health-related fields.

We know that there is no region in the country that is economically prosperous without a first-class institution. We also know that higher education should serve the broad needs of the state in terms of workforce and economic development as well as the creation of an educated, informed citizenry.

Economic conditions facing Arkansas have greatly limited financial resources; a situation that is unlikely to improve in the near future. As a result of these tough times, the Governor, General Assembly, and Coordinating Board must grapple with especially difficult questions about state priorities and attempt to balance competing needs and demands.

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APPENDIX A.

Progressive Policy Institute New Economy Index

Indicator	1999 Rank	2002 Rank	Score
Overall*	49	48	41.68
Aggregated Knowledge Jobs	49	49	5.90
Information Technology Jobs (*Employment in IT Occupations in non-IT industries as a share of total jobs.*		49	0.5%
Managerial, Professional & Tech Jobs *Managers, professionals, and technicians as a share of total workforce.*	43	49	21.3%
Workforce Education *A weighted measure of the educational attainment (advanced degrees, bachelor's degrees, associate degrees, or some college course work) of the workforce.*	48	41	44.6
Education Level of the Manufacturing Workforce *A weighted measure of the educational attainment of the manufacturing workforce.*		50	0.01
Aggregated Globalization Score	40	45	8.14
Export Focus of Manufacturing *Manufacturing export sales per manufacturing worker.*	41	48	$11,110
Foreign Direct Investment *The percentage of each state's workforce employed by foreign companies.*	37	41	3.3%
Aggregated Economic Dynamism Scores	24	35	8.38
"Gazelle" Jobs *Jobs in gazelle companies (companies with annual sales revenue that has grown 20 percent or more for four straight years) as a share of total employment.*	16	41	11.8%
Job Churning *The number of new start-ups and business failures, combined, as a share of all establishments in each state.*	14	12	20.8%
Initial Public Offerings *A weighted measure of the value and number of initial public stock offerings of companies as a share of gross state product.*	45	34	3.55
Aggregated Digital Economy Scores	49	47	6.06
Online Population *The percentage of adults with Internet access in each state.*	49	48	44.3%
Commercial Internet Domain Names *The number of commercial Internet domain names (".com") per firm.*	48	47	0.32
Technology in Schools *A weighted measure of five factors measuring computer and internet use in schools.*	31	30	1.66
Digital Government *A measure of the utilization of digital technologies in state governments.*	49	24	3.14
Online Agriculture ***(****A measure of the percentage of farmers with Internet access and who use computers for business.*		42	1.90

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Indicator	1999 Rank	2002 Rank	Score
Broadband Telecommunications *A measure of the use and deployment of broadband telecommunications infrastructure over telephone lives.*		42	1.88
Aggregated Innovation Capacity	50	49	6.07
High-Tech Jobs *Jobs in electronics manufacturing, software and computer-related services, telecommunications, and biomedical as a share of total employment*	40	43	2.4%
Scientists and Engineers *Civilian scientists and engineers as a percentage of the workforce.*	50	49	0.21
***Indus*try Investment in R&D** *(Industry investment in research and development as a percentage of Gross State Product (GSP).*	42	43	0.4%
Venture Capital *Venture capital invested as a percentage of GSP.*	47	45	0.01%

(Source: Progressive Policy Institute. (2000). *State New Economy Index.)*

APPENDIX B.

Arkansas Research Activity Milestones

University of Arkansas

The research history of Arkansas began with the establishment of the Agricultural Experiment Station at the University of Arkansas in 1888. The original mission of the Station was to deal with problems of practical importance to farmers, stock raisers and fruit growers of the state. By the 1950s, doctoral degrees were being awarded in several fields, and by 1970, the University of Arkansas had grown into a five-campus (UAF, UAMS, UALR, UAPB, and UAM) system.

EPSCoR

In 1979, the National Science foundation (NSF) requested that seven states write proposals to compete for funds under a new initiative called the Experimental Program to Stimulate Competitive Research (EPSCoR.) The basic EPSCoR grant funded programs that would overcome barriers to research in these states. Arkansas was one of the five original NSF-funded EPSCoR states and received $3 million from 1980-85.

Arkansas Science and Technology Authority

The Arkansas Legislative Council formed a task force in 1982 with former congressman Ray Thornton, then president of Arkansas State University, as chair. The task force recommended the creation of an economic development-oriented R&D organization. As a result of this recommendation, the General Assembly created the Arkansas Science & Technology Authority (ASTA) and charged it with increasing R&D activity in the state. Currently, ASTA provides a focal point for science and technology issues in the state and offers assistance in the funding of basic and applied research. Research assistance is made available through a seed capital investment fund that was initially funded at $1.8 million and has a worth today of approximately $4 million.

Genesis Incubator

The **Genesis Incubator**, located near the campus of UAF is the only survivor of an experiment in the mid-1980s to establish six business incubators in various locations throughout the state. The success of the project is directly related to policies and practices that encourage faculty to turn the results of their research into businesses. There are several current tenants who hold promise for job creation in technology-oriented fields.

Appendix B.
(con't.)

Biomedical Biotechnology Center and **Arkansas BioVentures**
The establishment of the UAMS **Biomedical Biotechnology Center** in 1994 and the **Arkansas BioVentures** incubator in 1997 on the campus of UAMS is proof of the state's progress in supporting research activities. When **BioVentures** opened its new facilities in 2003, there were 12 startup companies in operation with several more in the pipeline.

Donaghey College of Information Sciences and Systems Engineering
The establishment of the **Donaghey College of Information Sciences and Systems Engineering (CyberCollege)** at UALR in 1999 was a major step toward meeting the employment needs of information technology companies in central Arkansas. With support from the federally-funded Biomedical Research Infrastructure Network (BRIN) grant, the CyberCollege is cooperating with UAMS in the development of a new Ph.D. program in Bioinformatics. More than 350 students are majoring in programs offered by the CyberCollege and more than 800 students are enrolled in courses in the college.

Arkansas Research Matching Fund
In 1999, the Arkansas General Assembly established the **Arkansas Research Matching Fund** through Act 1545. For the first time, the state of Arkansas appropriated funds totaling $10 million to allow higher education institutions to compete for federal research dollars. Approximately $3.3 million was distributed during the 1999-01 biennium but no subsequent funding has been received.

Arkansas Biosciences Institute (ABI)
Created as a major research component of the Tobacco Settlement Proceeds Act of 2000, the **Arkansas Biosciences Institute (ABI)** supports the collaborative efforts of five institutions in the areas of agricultural and medical research. Scientists from Arkansas Children's Hospital, ASU, UA-Division of Agriculture, UAF, and UAMS conduct research that will lead to health improvement, particularly in the area of tobacco-related diseases. ABI receives an estimated $10 to $15 million of the Tobacco Settlement Program Fund for research and operating expenses. Proceeds are divided among the five member institutions.

Arkansas Research and Technology Park
UAF has taken a leadership role in the establishment of the **Arkansas Research and Technology Park (ARTP)**, which will be adjacent to the Genesis Incubator. The ARTP is intended to create clusters of expertise necessary to grow knowledge-based industries. It is expected that ARTP will create an environment capable of translating the intellectual property created by the University into the formation of new, knowledge-based industries.

APPENDIX C.

Timeline for Doctoral Education

Nov. 1990	UAF	Ed.D. in Higher Education and Educational Administration approved for UAF to offer at UALR campus.
Apr. 1991	ASU	SBHE notified of intent to submit proposals for Ed.D. in Educational Leadership and Ph.D. in Environmental Biology and that the proposed programs were outside of the institution's role and scope.
July 1991	ASU	Change in role and scope approved to allow a limited number of doctoral programs.
Oct. 1991	UALR	Request for a change in the role and scope for UALR so that the institution could offer doctoral programs in a limited number of fields with demonstrated utility for urban central Arkansas. The request was accompanied by proposals for two Ed.D. programs that were being offered by UAF on the UALR campus.
	UAF	Ph.D. in Rehabilitation approved. Program offered in conjunction with an existing program in rehabilitation education.
Nov. 1991	ADHE	Report on Graduate Education in Arkansas by consultants from the University of Oklahoma, University of Wisconsin, and Texas A & M University. Recommended that UAF remain the primary Ph.D. research institution and should not be duplicated. Also noted that UALR and ASU were positioned to move into doctoral education in certain areas with a pressing need, particularly teacher education at the doctoral level. Board members cautioned that the state's resources would limit expansion.
Jan. 1992	UAF	Ph. D. in Curriculum and Instruction approved. Program built on existing master’s programs in elementary, secondary, and special education.
	UALR	Approval of UALR’s request for a change in the role and scope so that the institution could offer doctoral programs in a limited number of fields with demonstrated utility for urban central Arkansas.

APPENDIX C.
(con't.)

Apr. 1992	UCA	Request for a change in role and scope to allow the offering of a limited number of specialized professional doctoral programs in the College of Education and a doctorate in School Psychology. Programs were intended to build on existing programs in Education and School Psychology.
	UAF	Ph. D. in Health Science approved. Program builds on existing programs M.S. in health science and the M.Ed. in health education. The health sciences emphasis under the HPER doctorate was being phased out.
	UAF	Ph.D. in Counselor Education approved. Replaced the Ed.D. in Counselor Education.
	UALR	The Ed.D. in Educational Administration and Supervision and Ed.D. in Higher Education, offered by UAF on the UALR campus, were approved to be offered by UALR.
	ASU	Ed.D. in Educational Leadership approved. Approval contingent on the filling of two faculty/administrative positions with qualified personnel.
Aug. 1992	UCA	SBHE declines UCA's requested change in role and scope to include the doctorate in School Psychology.
	SBHE	Board declares a moratorium on consideration of any new doctoral degree programs until their July 1993 meeting. The Board's resolution stated that with limited resources and growing demands for services and programs, institutions should maximize productivity by focusing on their missions and current degree programs before beginning new initiatives. The Director was instructed to provide campuses with degree productivity data and initiate discussions on ways to deal with programs not meeting the Board's productivity standards.
July 1993	SBHE	Moratorium on consideration of new programs ends.

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Oct. 1994	UCA	Second request for a change in UCA's role and scope to allow the offering of a limited number of specialized professional doctoral programs in the College of Education and doctorate in School Psychology. This request also asked that the change in role and scope include a doctorate in Physical Therapy.
Feb. 1995	UCA	Information item on Board agenda. ADHE staff recommended rejecting the request for a change in role and scope.
Apr. 1995	UCA	With a 9-3-1 vote, the SBHE declined to approve the request for a change in role and scope for UCA to offer doctoral degrees.
Oct. 1995	UAMS	Ph.D. in Nursing approved. Program featured collaboration with other schools and departments at UAMS, UALR, and UAF.
Feb. 1996	UAMS	Establishment of a Graduate School at UAMS and the transfer of certain graduate programs from UAF to UAMS. For many years, graduate courses at UAMS were offered through UAF, but taught exclusively on the UAMS campus. UAMS graduate faculty appointments and UAMS course/curriculum changes were handled by the UAF Graduate Council, but all other issues related to graduate programs were handled on the UAMS campus by UAMS staff. This reorganization formalized an existing structure and allowed UAMS to administer its own doctoral programs.
Sep. 1997	UCA	Institution requests AHECB to reconsider proposals previously denied by the SBHE for Ph.D. programs in School Psychology and Physical Therapy. The Board approved a change in role and scope to include the Ph.D. in Physical Therapy and approved the program. The Board declined to approve the change in role in scope to offer the Ph.D. in School Psychology.

APPENDIX C.
(con't.)

Apr. 1999	UAF	Ph.D. in Public Policy approved.
	UCA	Doctor of Physical Therapy (DPT) approved.
	ADHE	Presentation of role and scope statements to be voted on by AHECB at its July 1999 meeting. SAUM, UCA, and UAPB requested changes in their existing role and scope statements. SAUM and UAPB requested approval to expand master's degree offerings and UCA requested approval to offer the Ph.D. in School Psychology. Westark College role and scope was revised by Act 971 of 1997 that authorized the institution to offer select baccalaureate degrees, not to exceed a total of nine.
Oct. 1999	UCA	Institution requests AHECB to reconsider the proposal previously denied for a Ph.D. in School Psychology. Board approved of change in role and scope to include the Ph.D. in School Psychology and approved the Ph.D. in School Psychology.
Feb. 2000	AHECB	Coordinating Board directs ADHE staff to conduct a study of graduate education needs of the state and the use of limited resources to meet graduate education needs.
June 2000	ADHE	*Graduate Education in Arkansas: Doctoral and Specialist Degree Programs*, a report prepared by consultants from the Ohio Board of Regents, Oklahoma State University, and Colorado State University, presented at a special Board meeting. Institutions allowed two weeks to submit written responses to the report.
July 2000	ADHE	Staff recommendations related to the report *Graduate Education in Arkansas: Doctoral and Specialist Degree Programs* presented to AHECB. Board adopted 18 recommendations including a moratorium on new doctoral programs until January 2003 (Recommendation 4) and a complete review of existing doctoral programs at UAF (Recommendation 8). The moratorium did not affect the review of doctoral proposals that were already under consideration [Public History and Culture (ASU),

APPENDIX C.
(con't.)

		Knowledge and Information Management (ASU), Cell and Molecular Biology (UAF), Microelectronics-Photonics (UAF), and Anthropology (UAF)]. Collaborative programs were emphasized throughout the recommendations.
	UAF	Ph.D. in Microelectronics-Photonics approved. Program proposal indicates funding to support start-up costs, a program director, and 53 student years of Ph.D. Fellowships.
Feb. 2001	UAF	Ph.D. in Cell and Molecular Biology approved. Program is interdisciplinary involving 10 academic departments and two colleges.
	UAMS	College of Public Health approved. UAMS states that it intends to offer the Doctor of Public Health (DrPH) and Ph.D. degrees in core public health areas.
Apr. 2001	UAF	Ph.D. in Anthropology approved. Program builds on existing master's degree in Anthropology.
	ASU	Ph.D. in Heritage Studies approved (originally proposed as Public History and Culture). Program designed for students to identify, preserve, manage, and promote regional historical and cultural resources for non-specialist audiences using the lower Mississippi River Delta as a laboratory.
Dec. 2003	UAMS	Doctor of Public Health (DrPH) approved.

APPENDIX D.

Doctoral Programs Offered by Arkansas Institutions
Fall 2003

Institution	Program	Degree
Arkansas State University	Environmental Science	PhD
	Heritage Studies	PhD
	Educational Leadership	EdD
University of Arkansas, Fayetteville	Animal Science	PhD
	Poultry Science	PhD
	Food Science	PhD
	Plant Science	PhD
	Crop, Soil, and Environmental Sciences	PhD
	Computer Science	PhD
	Curriculum and Instruction	PhD
	Educational Administration	EdD
	Higher Education	EdD
	Counselor Education	EdD
	Adult Education	EdD
	Vocational Education	EdD
	Engineering	PhD
	English	PhD
	Comparative Literature	PhD
	Biology	PhD
	Cell and Molecular Biology	PhD
	Entomology	PhD
	Mathematics	PhD
	Microelectronics – Photonics	PhD
	Recreation	EdD
	Kinesiology	PhD
	Philosophy	PhD
	Chemistry	PhD
	Environmental Dynamics	PhD
	Physics	PhD
	Psychology	PhD
	Public Policy	PhD
	Anthropology	PhD
	Economics	PhD
	History	PhD
	Rehabilitation	PhD
	Health Science	PhD
	Business Administration	PhD
University of Little Rock at Little Rock	Educational Administration	EdD
	Higher Education	EdD
	Applied Science	PhD
University of Arkansas for Medical Sciences	Biochemistry and Molecular Biology	PhD
	Doctor of Public Health	DrPH
	Microbiology and Immunology	PhD
	Anatomy and Neurobiology	PhD
	Toxicology, Interdisciplinary	PhD
	Pharmacology	PhD
	Physiology and Biophysics	PhD
	Nursing	PhD
University of Central Arkansas	School Psychology	PhD
	Physical Therapy	PhD
	Physical Therapy	DPT

APPENDIX E.

Science and Engineering Graduate Students by State and Institution (FY2000)

	Science	Engineering	Total
Arkansas	**1396**	**562**	**1958**
UA-Fayetteville	720	562	1282
UA-Little Rock	240		240
Arkansas State Un.	165		165
Un. Central Arkansas	154		154
Un. Arkansas Med. Sciences	117		117
Kentucky	**2412**	**829**	**3241**
University of Kentucky	1233	299	1532
University of Louisville	597	530	1127
Western Kentucky University	216		216
Murray State University	172		172
Eastern Kentucky University	131		131
Morehead State University	63		63
Oklahoma	**2369**	**1116**	**3485**
University of Oklahoma	1070	451	1521
Oklahoma State University	971	489	1460
University of Tulsa	181		181
Northeastern State University	130		130
East Central University	16		16
Mississippi	**2127**	**501**	**2628**
Mississippi State University	830	400	1230
University of Mississippi	514	101	615
Un. Southern Mississippi	500		500
Jackson State University	283		283
West Virginia	**1442**	**582**	**2024**
West Virginia University	920	538	1458
Marshall University	522	29	551
WVU Institute of Technology		15	15
TOTAL	**9,746**	**3,590**	**1,3336**

(Source: National Science Foundation. (2002). *Graduate Students and Postgraduates in Science and Engineering*: *Fall 2000*.)

APPENDIX F.

CARNEGIE AND SREB INSTITUTIONAL CATEGORIES

Carnegie Classifications

The Carnegie Classification of Institutions of Higher Education is the leading typology of American colleges and universities. It is the framework in which institutional diversity in U.S. higher education is commonly described. Developed in 1971 under the leadership of Clark Kerr by the Carnegie Commission on Higher Education, the Classification was designed to support research in higher education by identifying categories of colleges and universities that would be "homogeneous with respect to the functions of the institutions and characteristics of students and faculty members."

Published in 1973, 1976, 1987, and 1994 and 2000, the Classification groups American colleges and universities according to their missions as revealed in existing data on their behavior. Over the years, it has been a useful tool for researchers and institutional personnel interested in analyzing individual institutions, students and faculty, and the system of higher education as a whole. Because of its emphasis on institutional "functions," the classification is widely interpreted as differentiating colleges and universities with respect to mission.

In 2000, the number of categories used to group doctorate-granting institutions decreased from four to two as a result of suspending measurement of research activity solely based on the use of federal obligations (data published by the National Science Foundation). After reviewing the Classification's strengths and weaknesses as well as its current uses, the Foundation is undertaking a thorough reassessment of the classification system to be concluded in 2005.

Currently, 3,941 institutions are classified in the broad categories of Doctoral/Research Universities, Master's Colleges and Universities, Baccalaureate Colleges, Associate's Colleges, Specialized Institutions, and Tribal Colleges and Universities.

Criteria for the categories and Arkansas institutions within each category are listed below. For classification purposes, degree production was measured from 1995-96 through 1997-98, and a three-year average was calculated.

APPENDIX F.
(con't.)

Doctorate-Granting Institutions (261 nationwide)

- Doctoral/Research Universities--Extensive (151 nationwide)

  Offer a wide range of baccalaureate programs and are committed to graduate education through the doctorate. They award 50 or more doctoral degrees per year across at least 15 disciplines (4-digit CIP code).

  - University of Arkansas, Fayetteville

- Doctoral/Research Universities--Intensive (110 nationwide)

  Offer a wide range of baccalaureate programs and are committed to graduate education through the doctorate. They award at least 10 doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall.

  - University of Arkansas-Little Rock

Master's Colleges and Universities (611 nationwide)

- Master's Colleges and Universities I (496 nationwide)

  Offer a wide range of baccalaureate programs and are committed to graduate education through the master's degree. They award 40 or more master's degrees per year across three or more disciplines.

  - Arkansas State University, Arkansas Tech University, Henderson State University, Southern Arkansas University, University of Central Arkansas

- Master's Colleges and Universities II (115 nationwide)

  Offer a wide range of baccalaureate programs and are committed to graduate education through the master's degree. They award 20 or more master's degrees per year across three or more disciplines.

  - There are no Arkansas public higher education institutions in this classification.

APPENDIX F.
(con't.)

Baccalaureate College (606 nationwide)

- Baccalaureate Colleges--Liberal Arts (228 nationwide)

  Primarily undergraduate colleges with major emphasis on baccalaureate programs. They award at least half of their baccalaureate degrees in liberal arts fields.

  - There are no Arkansas public higher education institutions in this classification.

- Baccalaureate Colleges--General (321 nationwide)

  Primarily undergraduate colleges with major emphasis on baccalaureate programs. They award less than half of their baccalaureate degrees in liberal arts fields.

  - University of Arkansas-Monticello, University of Arkansas-Pine Bluff

- Baccalaureate/Associate's Colleges (57 nationwide)

  Undergraduate colleges where the majority of conferrals are below the baccalaureate level (associate degrees and certificates). Bachelor's degrees accounted for at least 10 percent of undergraduate awards.

  - University of Arkansas-Fort Smith will be included in this category in 2005 unless fewer than 10 percent of its undergraduate awards are at the baccalaureate level in which case it will be again be classified as an Associate's college.

Associate's Colleges (1,669 nationwide)

These institutions offer associate's degree and certificate programs but, with few exceptions, award no baccalaureate degrees. This group includes institutions where, during the period studied, bachelor's degrees represented less than 10 percent of all undergraduate awards.

- Arkansas Northeastern College
- Arkansas State University - Beebe
- Arkansas State University - Mountain Home
- Arkansas State University - Newport

APPENDIX F.
(con't.)

- Black River Technical College
- Cossatot Community College of the University of Arkansas
- East Arkansas Community College
- Mid-South Community College
- National Park Community College
- North Arkansas College
- NorthWest Arkansas Community College
- Ouachita Technical College
- Ozarka College
- Phillips Community College of the University of Arkansas
- Pulaski Technical College
- Rich Mountain Community College
- South Arkansas Community College
- Southeast Arkansas College
- Southern Arkansas University Tech
- University of Arkansas at Fort Smith
- University of Arkansas Community College at Batesville
- University of Arkansas Community College at Hope
- University of Arkansas Community College at Morrilton

APPENDIX F.
(con't.)

SREB Classifications

SREB began categorizing institutions so that statistical comparisons could be made among states. Institutions change categories when they meet the criterion for another category for the third consecutive time. Since 2002, SREB classifications for two-year colleges and technical institutes/colleges are divided into sub-categories based on institutional enrollment.

Categories are based on a number of factors relevant to determining resource requirements. These factors include:

- Size (number of degrees or FTE enrollment)
- Role (types of degrees)
- Breadth of program offerings (number of program areas in which degrees are granted)
- Comprehensiveness (distribution of degrees across program areas)

Four-Year Universities and Colleges

Four-Year 1 Institutions awarding at least 100 doctoral degrees that are distributed among at least 10 CIP categories (2-digit classifications) with no more than 50 percent in any one category.

- Arkansas is the only SREB state that does not currently have a Four-Year 1 university.

Four-Year 2 Institutions awarding at least 30 doctoral degrees that are distributed among at least 5 CIP categories.

- University of Arkansas, Fayetteville (Met criteria as a Four-Year 1 institution in 2002-2003.)

Four-Year 3 Institutions awarding at least 100 master's, education specialist, post-master's, or doctoral degrees with master's, education specialist, and post-master's degrees distributed among at least 10 CIP categories.

- Arkansas State University, University of Arkansas-Little Rock, University of Central Arkansas

APPENDIX F.
(con't.)

Four-Year 4 Institutions awarding at least 30 master's, education specialist, post-master's, or doctoral degrees with master's, education specialist, and post-master's degrees distributed among at least 5 CIP categories.

- There are no Four-Year 4 institutions in Arkansas. ATU and HSU are currently meeting Four-year 4 criteria but need to maintain this criteria for 3 consecutive years in order to be reclassified.

Four-Year 5 Institutions awarding at least 30 master's, education specialist, post-master's, or doctoral degrees.

- Arkansas Tech University, Henderson State University, Southern Arkansas University

Four-Year 6 Institutions awarding less than 30 master's, education specialist, post-master's, or doctoral degrees.

- University of Arkansas-Monticello, University of Arkansas-Pine Bluff

Two-Year 1 Institutions awarding associate degrees and offering college transfer courses with FTE enrollment of 5,000 or more; some certificates and diplomas may also be awarded.

- Arkansas does not have any Two-Year 1 institutions.

Two-Year 2 Institutions awarding associate degrees and offering college transfer courses with FTE enrollment of between 2,000 and 4,999; some certificates ad diplomas may also be awarded.

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- Arkansas Northeastern College
- Arkansas State University-Beebe
- Northwest Arkansas Community College
- Pulaski Technical College
- University of Arkansas-Fort Smith

APPENDIX F.
(con't.)

Two-Year 3 Institutions awarding associate degrees and offering college transfer courses with FTE enrollment of less than 2,000; some certificates and diplomas may also be awarded.

- Arkansas State University-Mountain Home
- Arkansas State University-Newport
- Black River Technical College
- Cossatot Community College of the University of Arkansas
- East Arkansas Community College
- Mid-South Community College
- National Park Community College
- North Arkansas College
- Ouachita Technical College
- Ozarka College
- Phillips Community College of the University of Arkansas
- Rich Mountain Community College
- South Arkansas Community College
- Southeast Arkansas College
- Southern Arkansas University Tech
- University of Arkansas Community College at Batesville
- University of Arkansas Community College at Hope
- University of Arkansas Community College at Morrilton

APPENDIX G

Carnegie/SREB Institutional Categories for Arkansas Institutions

	ASU	ATU	HSU	SAUM	UAF	UALR	UAM	UAPB	UCA
Master's programs AY2004	53	19	16	8	91	37	4	8	31
# Master's CIP Codes AY2004	16	8	5	1	22	16	2	3	14
Master's degrees awarded 2002-03	283	172	107	44	803	372	47	20	284
Specialist programs AY2004	9	1	1	0	7	2	0	0	1
# Specialist CIP Codes AY2004	1	1	0	0	1	1	0	0	1
Specialist degrees awarded 2002-03	17	8	0	0	4	13	0	0	2
Doctoral programs offered AY2004	3	0	0	0	34	3	0	0	2
# Doctoral CIP Codes AY2004	3	0	0	0	16/31*	2	0	0	2
Doctoral degrees awarded 2002-03	9	0	0	0	120	29	0	0	7
Current Carnegie Category	Master's 1	Master's 1	Master's 1	Master's 1	Doctoral Research Extensive	Doctoral Research Intensive	Baccalaureate College-general	Baccalaureate College-general	Master's 1
Requirements for next level *(4-digit CIP Code)*	Award at least 10 doctoral degrees per year across 3 or more disciplines or at least 20 doctoral degrees per year overall.	Award at least 10 doctoral degrees per year across 3 or more disciplines, or at least 20 doctoral degrees per year overall.	Award at least 10 doctoral degrees per year across 3 or more disciplines, or at least 20 doctoral degrees per year overall.	Award at least 10 doctoral degrees per year across 3 or more disciplines, or at least 20 doctoral degrees per year overall.	Top Category.	Award at least 50 or more doctoral degrees per year across at least 15 disciplines.	Award 20 or more master's degrees per year.	Award 20 or more master's degrees per year.	Award at least 10 doctoral degrees per year across 3 or more disciplines, or at least 20 doctoral degrees per year overall.
Current SREB Category	4-year 3	4-year 5	4-year 5	4-year 5	4-year 2	4-year 3	4-year 6	4-year 6	4-year 3
****Requirements for next level.** *(2-digit CIP Code)*	Award at least 30 doctoral degrees distributed across at least 5 CIP categories	Award at least 30 master's, specialist or post-master's degrees distributed across at least 5 CIP categories.	Award at least 30 master's, specialist or post-master's degrees distributed across at least 5 CIP categories.	Award at least 30 master's, specialist or post-master's degrees distributed across at least 5 CIP categories.	Award at least 100 doctoral degrees distributed across at least 10 CIP categories with no more than 50% in any one CIP category.	Award at least 30 doctoral degrees distributed across at least 5 CIP categories.	Award at least 30 master's, specialists, post-master's, or doctoral degrees.	Award at least 30 master's, specialists, post-master's, or doctoral degrees	Award at least 30 doctoral degrees distributed across at least 5 CIP categories.

* SREB /Carnegie

** SREB requires that criteria for each classification be maintained for three consecutive years before higher reclassification is approved

† Carnegie Classification was created using the most current data available for a three-year period. 2000 Carnegie Classification referenced for this table, using data from 1995-96 through 1997-98.

†† SREB Classification was created using the most current data available for a three-year period.

APPENDIX H.

Degrees Awarded by Arkansas Public Institutions 1998-99 through 2002-03

	1998-99	1999-00	2000-01	2001-02	2002-03	Total
Certificate of Proficiency	1118	1419	1588	2007	2011	8,143
Technical Certificate	1269	1229	1125	1105	2044	5,629
Associate	3175	3636	3749	4005	4427	18,992
Advanced Certificate	16	12	8	9	2	47
Baccalaureate	7436	7438	7615	8007	8449	38,945
Post-Baccalaureate Certificate	14	13	5	15	17	64
Master's	2202	2266	2145	2284	2205	11,102
Specialist	31	33	51	45	44	204
Doctoral	125	134	144	165	182	750
First-Professional	471	494	512	490	459	2,426
Post First-Professional	122	126	148	132	139	667
Total	**15,979**	**16,800**	**17,090**	**18,264**	**19,979**	

APPENDIX I.

Report on Doctoral Education, University of Arkansas, Fayetteville
Dr. Garrison Walters, Dr. Wayne Powell, Dr. Jules LaPidus
February 20, 2003

Charge to the Review Team/Process Employed

In February 2000, the Arkansas Higher Education Coordinating Board directed the Arkansas Department of Higher Education (ADHE) staff to conduct a study to determine the graduate education needs of the state of Arkansas and the best use of limited state resources to meet the need. Dr. Garrison Walters, Vice Chancellor for Academic Affairs at the Ohio Board of Regents; Dr. Wayne Powell, Vice President and Dean of Academic Affairs at Lenoir-Rhyne College, North Carolina; and Dr. Albert Yates, President of Colorado State University, were employed to conduct the study.

Based on the findings of the graduate education study, the Coordinating Board placed a moratorium on the establishment of new doctoral degree programs, with a few exceptions, from July 2000 through January 2003. The Board also directed the ADHE staff to review the doctoral programs at the University of Arkansas, Fayetteville (UAF), to assess the need for the programs.

During the fall of 2000, UAF and ADHE staff met to develop the program review plan and agree upon the review process. UAF faculty conducted departmental self-studies, and out-of-state consultants were employed for further assessment of some programs. The synopses of the departmental assessments and consultant reports were submitted to ADHE in September 2002.

Two members of the graduate education review team, Dr. Walters and Dr. Powell, along with Dr. Jules LaPidus, former Graduate Dean at Ohio State University and former President of the Council of Graduate Schools, were employed by ADHE in October 2002 to review the UAF doctoral report to assess the university's ability to implement and maintain quality doctoral programs. The review team read the university's assessment documents before writing a report on the program review and improvement process at UAF, the role of the graduate school, and the need for doctoral education.

Framing Comments

The previous review of statewide graduate education (see above) emphasized the need for the state of Arkansas to be selective in its investments in doctoral education, focusing on areas with the greatest potential for benefit to the state's economy and quality of life, and building wherever possible on existing strengths. To that end, this earlier review emphasized the central role of UAF and encouraged the state to place its highest priority for investment in working with UAF to strengthen programs of the greatest need. The current Review Team would like to reaffirm the commitment to the principle that the focal point of doctoral education in Arkansas must be at UAF. While there may be some demand for service-oriented graduate programs elsewhere in the state, the population of the State and the resources available for higher education dictate that the locus of investment in *research* and *research-oriented* doctorates should remain at UAF (and for defined fields at UAMS), where there is a strong foundation on which to build.

APPENDIX I.
(con't.)

The review undertaken by the University during 2001-02 was the first step in the process proposed in the earlier review. ADHE's decision to do this so quickly reflects an admirable clarity of purpose in securing benefit to the state. The accelerated nature of the review--from start to finish in some eighteen months--did, however, create a significant burden for the university administration. In a normal case, comprehensive program reviews of this kind are completed sequentially rather than all at once. As a result, many of the Review Team's criticisms can be ascribed to the haste inherent in this process, something that should not be a problem in the future as departmental reviews occur on a normal schedule.

The Review Team was not asked to assess the state's role in supporting the University and lacks all of the evidence required to do so. However, the information provided to the Review Team suggests that the University does not have the resources it needs to accomplish even its carefully focused mission in doctoral education. As UAF reinforces its commitment to providing programs that are most responsive to need and meet the highest standards of quality, the state should find ways to recognize and reinforce this good and hard work with greater financial assistance. To do otherwise would be to overlook a tremendous public asset and ignore its current and future potential for improving the state's economy and quality of life.

General Observations

- The University appears to have an appropriate mix of doctoral programs and, given the resources available to the university (and within the limits of the data available to the Review Team), these offerings seem to be effective and successful.
- The programs as they are now offered provide the necessary foundation for setting even more demanding standards-- a consistently high level of success in serving the state, the nation, and the world. However, if such a goal is to be achieved quickly, internal review and program improvement processes should be substantially strengthened.
- As the University continues the process of refining program focus and strengthening quality, the State should give the greatest possible attention to improving the University's resource base. Graduate research universities provide an immense economic and quality of life advantage to the regions in which they operate. Sound public policy mandates that a state make substantial, sustained, and carefully focused investments in institutions such as UAF.

Comments on the University Review Process

The internal process at UAF appears to have employed the following sequence: program level self-studies, then program level consultant reports, then college level summaries, then campus-wide consultant reports.

APPENDIX I.
(con't.)

- **Program level self-studies**

The Review Team reviewed a sample of the program level self-studies. It is our opinion that these are not real self-studies, at least not in the sense of work that will lead to the most effective program review and improvement. The documents we saw were essentially descriptive catalogs of program activities. The Review Team urges UAF to take a different approach in the future. It should also be noted at this point that the Review Team had serious concerns about the quality and organization of the data provided (see Appendix A for details).

A few years ago the Council of Graduate Schools published a booklet on the academic review of graduate programs. In essence, this was a description of approaches and processes used by many universities, followed by a discussion of best practices. Among other things, some guidelines were provided for departmental self-studies. This went far beyond the collection and presentation of data.

Departments were asked to get faculty and graduate students together to discuss views of the department, its strengths and weaknesses, what it would like to do, what it had to do, what was possible to do, and to develop a shared vision for the future of the graduate program, consistent with the overall plan of the University and realistic with respect to the prospect and availability of resources.

A thoughtful self-study process is invaluable in challenging the faculty to think through the purpose of the program. More than just a catalog of activities, it forces faculty to set realistic aspirations. 'Realistic' in this case means that a few areas of existing success or promise will be strengthened while others, likely the majority, must inevitably be left to supporting roles or even to wither away. In today's academic environment, in which the expansion of the knowledge base in all disciplines appears to be perpetual, every department must make choices about areas of emphasis. At the smaller and less financially strong universities, the choices will necessarily be tougher. A well-constructed self-study, followed by a rigorous (and rigorously independent) external review is the only way to have a chance at success.

- **Program level consultant reports**

With the exception of Chemistry, the samples we saw included only one external reviewer per program. The Review Team considers the practice of using a single external reviewer to be unwise. Such an approach limits the scope and perspective of the critically important external assessment, and offers the potential of reducing objectivity.

To ensure quality and objectivity, the Review Team believes that external assessment should use a process similar to the following: 1) reviewers are chosen by the Graduate School (or Provost's office) in consultation with program faculty—care is taken to ensure that the reviewers have no ties to the program or to faculty (it is highly desirable to use at least one consultant with experience in this type of review); 2) the Graduate School

charges the reviewers, makes the necessary arrangements, and receives the report; 3) sites visits are managed in a way that limits or excludes social interaction.

Ideally and to the extent consistent with state law, external assessments at this level should be treated as confidential. The kind of candor that is needed for program improvement is likely to be inhibited when reviewers know that their report will receive wide circulation. The Review Team has observed that the press, and sometimes other organizations external to the university, often take critical comments out of context. Consistent with this concern, the Review Team will not comment on information drawn from the program level self-studies it has been provided.

- **College level summaries**

The college level summaries are extensions of the self-studies, providing more of a catalog of activities than a critical analysis. Even so, some are well done and provide useful information for evaluation. If challenging self-studies and rigorous external reviews were available, the college level documents could be quite useful for planning.

- **Campus-wide consultant reports**

Especially given the weakness of the data and analysis provided, the Review Team thought that these were very well done.

- **Summary of the Process**

The key is to do a better job at the program level. If that occurs, the rest of the process should be quite productive, especially if combined with an even more active Graduate School role (see below).

Comments on Individual Program Areas

As noted, the Review Team has had access only to college level summaries of the program self-studies and analyses. Since these summaries are highly uneven and, at best lacking in detail, it is difficult for the Review Team to make many specific comments.

- **Bumpers College of Agricultural, Food and Life Sciences**

This college-level review is very well done, providing convincing evidence of faculty quality, and overall productivity. The college's programs appear to be an excellent resource for the region and a competitor nationally.

- **Fulbright College of Arts and Sciences**

The information provided in this section is insufficient to make comments about any one program. The observations that follow, therefore, are necessarily fairly general.

APPENDIX I.
(con't.)

- **Life Sciences**

This area of doctoral education is expanding rapidly in importance, and is becoming increasingly interdisciplinary as, for example, life scientists reach out to specialists in computer and computational science to assist in managing and understanding the vast amounts of data generated by new analytical processes.

The information in this section really doesn't tell us much about the vitality of the life sciences programs at UAF. The previous report on doctoral education recommended a closer relationship between UAF programs in life sciences and those of the Medical Center in Little Rock. The initial report provided little detail on this point, though information subsequently provided gives a picture of substantial activity. Given the need for critical mass in this area, one very productive use of the Walton money might be to build a fiber optic link between the two campuses (probably lease rather than build, as it is likely that cable is already in the ground). The high bandwidth and quality of service of such a link would provide substantial benefit beyond that of the existing Internet2 and video conferencing capability. Full use of a fiber would provide dedicated chancels for shared instrumentation and the opportunity to employ next generation video conferencing that will change the way people think about collaboration. Faculty, graduate students and postdocs of the two campuses could work together as if they were in the same place. Other disciplines, including all three of the interdisciplinary chairs proposed in the report, would probably benefit from such a link as well.

- **Humanities**

Market saturation for Ph.D.s in English and History appears to be permanent. Elite schools alone are able to satisfy demand for tenure track positions at colleges and universities. How can UAF compete in this environment? 1) Make sure students know about the job market; 2) find niche areas where smaller programs can excel; and 3) prepare students for the world they are likely to enter, especially for teaching in undergraduate institutions. It seems probable that the humanities departments are doing these things, but it is not clear from the report. One concern is enrollment. The size of the English program suggests focus and attention to the job market, but this is less clear for History, which has twice as many students and (apparently) a very low persistence rate.

Creating the Brown Chair in English Literacy is a great idea, something that will be useful to the state and the nation.

- **Education and Health Professions**

This report provides very little comparative information about faculty or student quality. The narratives on student quality suggest a program that is attractive regionally and nationally competitive in some areas. Graduation data suggest that all but the Secondary Education, Special Education, and Vocational Education programs have sufficient enrollments and productivity. Descriptive information suggest that this college is an effective and important contributor to the professional resource requirements of the state and the region.

- **Engineering**

This report provides very little comparative information about faculty or student quality. Engineering productivity appears to be somewhat low for a program of this size. The computer science program is evidently too new to have any graduates. It will be very difficult for the university to have a competitive program in this latter area absent some clear specialization.

- **Walton College of Business**

This report provides very little comparative information on faculty or student quality, although the anecdotal information on individual achievement is encouraging. The business program appears to be productive (although there are no breakdowns by area of emphasis). The Review Team believes that the college should seriously consider discontinuing the doctoral program in economics; a total of two graduates in five years sets off alarm bells about the critical mass needed for quality.

- **Library**

One option for strengthening the library would be a consortial arrangement with a neighboring state (Oklahoma, Missouri) that has or is considering building a statewide library system like Ohio's OhioLINK. Many of the costs of such a system could be shared in this way.

The Role of the Graduate School

Graduate Schools can have a critical, catalytic role in improving the quality of doctoral education. As a result, the Review Team has given this area special emphasis.

- **Active role in program improvement**

The Review Team believes the Graduate School should be more assertive in its articulation of the purpose of doctoral education. In general, doctoral programs best serve the citizens of a state by providing programs that are nationally (and internationally) competitive, thus providing students with a first-class education and background for productive scholarship. Although many programs focus part of their activities on issues of interest to their states, and may pay particular attention to local or regional economic or technical concerns, or to providing faculty for regional institutions, the overall objectives of the programs must transcend geographical or local political concerns and ensure that students are well prepared in their fields of interest. The best doctoral programs have among their calling cards the fact that most of their students come from around the country and in fact around the world. These students are attracted to top programs that have recognized research programs. Thus, the number of out-of-state students increases when the quality of the research goes up. The initial benefit to the state is that the students enhance the research programs, which brings funding to the state and often directly supports economic development. A secondary benefit is that doctoral graduates may choose to locate in the state permanently, especially if the program is professionally oriented. However, in the best programs, the graduates will also leave for universities outside the State. A graduate program with a

goal of national recognition should not try to focus on educating the students from the state and region.

Arkansas is not yet at the stage of development where it can compete nationally with the best in all areas at once. UAF thus needs to have each program seek to achieve well defined "Measures of Excellence" that are very specific to the program. These Measures of Excellence should be developed by the individual programs, should be quantifiable, should be accepted by the administration, and should be reviewed periodically for progress.

To illustrate, a useful role for the Graduate School would be to challenge programs to implement a process of continuous improvement. For example, each program should have clear and carefully defined goals specifying why it is uniquely important vis a vis other programs in the nation and the world. Rather than vague generalizations about excellence, such goals should include Measures of Excellence that are specific enough that a process for improvement could be built on them. For example, by specifying the sub-areas of strength in the program and how they compare to the competition, a clear plan for improvement in faculty hires, graduate student and postdoc recruitment, etc. can be created. If it is a program in the sciences where a significant proportion of graduates are employed in industry, the plan could involve getting feedback from graduates and employers, perhaps by establishing industrial advisory groups, that, within the appropriate sphere of graduate education, could ensure that graduates are even better prepared in the future. Instead of relying on reputational rankings, which are at best deeply flawed, a process of this kind would allow for true measures of program success. The University would be able to describe its achievements in meaningful terms.[*]

The Graduate School could also implement and coordinate a campus-wide computerized information system. Many institutions have done this, and the Council of Graduate Schools has presented numerous workshops on this topic. Among those institutions in the forefront of efforts of this kind have been Iowa, Indiana, Ohio State, Michigan, and U. Cal, Berkeley.

Rather than adding a position in graduate student recruitment, it might make more sense to have someone whose job is primarily concerned with student placement and employment. A topic of major interest and concern in graduate education over the past several years has been the employment of Ph.D.s, particularly with respect to assisting students in identifying a broad array of career opportunities in addition to the traditional ones in the Academy. Several institutions have developed programs in this general area, notable among them being the Universities of Chicago and Pennsylvania. In addition to providing data, this person could assist in translating graduate and employer

[*] Elements of this approach are included in the *College Assessment of Doctoral Programs* appended to the report of the College of Education and Health Professions Doctoral Program Review (#4). See bottom of page 2, "State the program faculty's assessment…" Note that most of the information described in this document was not made available to the Review Team.

views of program strengths and weaknesses back to departments. This could be emphasized by departments inviting former graduates back to participate in departmental seminars on jobs and careers. Having someone with such a role would be very consistent with improving recruitment, since placement is one of the things prospective students are most interested in.

At this stage in its development it would be surprising if UAF were able to attract large numbers of top post-docs. Again, perhaps the University needs to take a unique approach. What about creating "Teaching Post-docs" that focus on training new PhDs for academic careers, something that most graduate schools do a miserable job of accomplishing? MIT has recently received Howard Hughes funding to do just this in Molecular Biology. Perhaps Arkansas could become known as the School that trains the next generation of faculty.

Nothing happens in graduate programs, particularly doctoral programs, without the commitment of the faculty, ideally working closely with the graduate students, the administration, and the alumni. A strong graduate school can foster an atmosphere where this can take place as well as provide some standards across the institution to ensure that all of this occurs in a collegial and institution-wide manner.

Overall Strengths

- The data and narrative paint a picture of UAF as a research university focused primarily in the state and region, with the largest number of its students coming from Arkansas, Texas, and Missouri, and with many choosing to remain in this region after obtaining the doctorate. This can be both a strength and a weakness as programs so focused, while often viewed with favor locally because of their responsiveness to issues of immediate interest to the state and region, have a tendency to become provincial and to run the danger of short-changing students and the state as well. Paying attention to local concerns, while ensuring that students are educated to think beyond those immediate issues usually works best.
- UAF is moving aggressively to develop interdisciplinary programs and this clearly is a useful direction for graduate education.
- The availability of the Walton funds will enable UAF to be creative as it plans for the future. Plans for these funds are currently focused on diversity related issues and improving stipends. These activities will complement programmatic planning as they will provide the opportunity to pursue selective as well as general excellence.

Overall Weaknesses (see also Recommendations)

- The documents presented to the Review Team do not provide a well-articulated reason for the State to aggressively pursue doctoral education. If the University has not developed such a rationale it should do so. If it has, it should give it

- greater prominence, especially in program reviews such as this. A clear statement of purpose is an essential foundation for improving quality. Its absence in this case made the Review Team uncertain about UAF's sense of identity and purpose in doctoral education.
- Low stipend levels are apparently pervasive. The University recognizes the need to raise them and has moved in that direction. Although there are a number of symptoms of what appears to be low state support (including small numbers of faculty in core programs, low faculty salaries, and laboratory/ library resources), this area provides one of the clearest examples. Programs at UAF do not rate highly in the national reputation surveys, and while these surveys are hardly quantitative representations of the institutions (in addition to many other flaws), they may have an effect on student choice as well as the advice students get about choosing an institution for graduate work.
- Many programs have relatively low enrollment, low doctoral productivity, and high rates of non-completion. To a considerable extent this is an indication of lack of resources, but the Review Team believes that added investment is a better choice than program elimination. Comprehensive research universities develop powerful synergies through the interrelatedness of research and graduate education across disciplines. For example, research in chemistry under girds most of what happens in the life sciences, chemistry and physics are central to progress in materials sciences and engineering, computer science provides knowledge and tools that advance all sciences, and so on. UAF has approximately the minimum number of programs needed to secure the benefits of being a comprehensive research institution, but lacks the resources to get all of the benefits from interdisciplinary synergy. As noted elsewhere, there are steps that the University could take with existing resources to strengthen programs. These include greater focus within program areas, and a more dedicated effort to promote continuous improvement.
- The Review Team sees no evidence at this time of the need for new doctoral programs at UAF. The University has been careful and realistic about adding new programs in the past, and the Review Team is confident that the same approach will result in new programs being added if and when necessary.

Review Team Recommendations

- Develop a data system that does the following:
  - Provides comprehensive information on student employment after graduation, including, for example, nature of work if in business/ industry and nature of employment (tenure track, institutional type) if in higher education.
  - Connects graduate faculty status (or another measure of faculty research and scholarly productivity) to number of active doctoral students
  - Differentiates doctoral students from other graduate students with respect to stipends and drop-outs
  - Provides a uniform format across units for the presentation of data

  - Develops an approach to understanding "yield" with respect to graduate student acceptances. For example, what percent of the most desirable applicants, as determined by a program, actually enroll at UAF? Where else do they go and for what reasons?
- Find ways that clearly identify the uniqueness of UAF programs. Try to focus on excellence in selected areas at the university and within particular programs. UAF cannot at this time compete in mainstream programs on a national scale.
- Seek to develop unique, distinctive programs that address regional as well as more global issues and invest in making these programs world leaders. In the current state of the world and higher education, it is unlikely that these programs would be in mainstream disciplines; the inter- and multi-disciplinary programs that have already been developed at UAF are probably a better model for what makes sense at this time.
- Develop a practical program for achieving competitive stipend levels. A first step would be a realistic assessment, on a program by program basis, of who represents the competition and what kinds of stipends they offer.

The materials we have seen portray programs that are somewhat below average in general (at least by reputation in the National Academy Study), have some good people, and are primarily serving a regional and international clientele. The graduate students they attract tend to be from less than first line institutions and part of this is due to low stipends, while part is due to the standing of the University. UAF does have opportunities to develop selectively, particularly in interdisciplinary or combined programs, and seems to be doing some of this now, particularly through the development of interdisciplinary programs.

Summary and Conclusions

The success of a public doctoral research university can be described in terms of responsibility. The university has a responsibility to determine which programs and program emphases it should offer in order to provide an effective balance that serves the needs of the state, the nation, and the world (remember that looking beyond the region or the state is intrinsic to doctoral education). It then must maintain a process that reexamines these choices at appropriate intervals and works to strengthen program quality on a continuous basis. The state, an essential partner, has a responsibility to assist in determining needs, to provide the necessary resources, and to assist the university in communicating its necessarily complex mission to the public.
Overall, UAF has met its core responsibilities and is making strong progress toward higher levels of achievement. It has chosen a mix of programs that is consistent with the balance of local and external constituencies referred to above. Unlike many public universities of similar size that seek to expand the breadth of offerings beyond what is reasonable either for their resource base or in the context or regional and national need, UAF has developed and maintained a prudent balance, giving its greatest attention to program improvement as opposed to new or expanded offerings. The evidence available to the Review Team suggests that the University has achieved considerable

success in the professional areas that have an important local and regional service dimension—business, agriculture, education, engineering. Comparable success in the arts and sciences is less evident, though it should be acknowledged that these areas, with their greater national emphasis, are more difficult to measure. The Review Team's strongest recommendation is that the University reinforce its existing achievements with an even more rigorous internal process of setting goals, choosing focus areas, and building quality.

As noted in the Framing Comment, the Review Team lacks all of the evidence required to assess public support for UAF. But the information at hand suggests that funding is insufficient for a university that must play the dual role of being competitive nationally and internationally while also serving as an economic engine and quality of life leader for the state. UAF is moving to make the tough choices necessary to manage resources for excellence. If it is to succeed, the state must be a partner. Greater focus can improve effectiveness, but quality requires investment.

Review Team Comments About Data
Appendix A of 2003 Doctoral Education at UAF Report

The following are some of the concerns that the Review Team had about the data provided to them (and evidently also used in the internal review process). This list is intended to be illustrative rather than comprehensive.

- There was inconsistency in the placement of the data. At times they were confusing and difficult to analyze. It isn't clear, for example, what proportion of the total number of graduates is reported.
- Critical information, such as the nature of academic positions (e.g. tenure track or not, institutional mission), is missing. Many departments fail to provide evidence of a strong, dynamic link with graduates. It is subject to interpretation whether this is due to incomplete reporting or a lack of follow through on the part of the programs.
- The reports provide the ratio of all faculty to all students by program, but the ratio of research-active faculty to students is the key measure. This is always difficult to quantify but it can be done by defining "research active faculty" in terms of graduate faculty status or having published in the last 5 years.
- Productivity in terms of degrees produced by year was not readily determined.
- An important component of a doctoral program is the research activity of the program. One quantifiable measure of research activity is the number of postdocs working in the program and the funding sources of those postdocs. This data was missing.
- There is a lack of quality data related to time-to-degree as measured from the time of entry into the program. There needs to be a good comparison between time-to-degree data collected at UAF with national data. Another complicating factor is that national data are grouped by broad disciplinary area as defined by the study, and it is unlikely that these correspond to programs at UAF.

APPENDIX I.
(con't.)

- It is not clear whether the terms "graduate student" and "doctoral student" are being used interchangeably (see for example the tables in attachment B. to the Smith letter of 10/15/02 to Floyd and Moten – the heading uses "graduate enrollment" but the tables use "doctoral enrollment"). This also becomes an issue in the case of the information on diversity and student financial aid. Doctoral only or masters as well?
- It is not clear when a graduate student becomes a doctoral student. Some schools measure this upon completion of the masters, some use completion of the qualifying exam, while some use first enrollment. Each discipline must seek to establish statistics that are consistent through the years and consistent with national concepts in the discipline.

The tables in the Education and Health Professions section are sometimes organized by department and sometimes by program. This can be confusing for the reader. For example, Tables 1 & 2 apparently include Educational Administration and Higher Education under Educational Leadership, Counseling, & Foundations; Tables 3 & 4 are arranged by program. There seems to be no indication in the report of the structure (that is, which programs are in which departments). For the most part, purpose is discernable, but in some cases it can give rise to difficulty in understanding the data.

APPENDIX J.

UAF GRADUATE SCHOOL RESPONSE TO DOCTORAL EDUCATION REVIEW March 2003

Issue: The Doctoral Mission at the University of Arkansas

Consultants: "The documents presented to the Review Team do not provide a well-articulated reason for the State to aggressively pursue doctoral education. If the University has not developed such a rationale it should do so. If it has, it should give it greater prominence, especially in program reviews such as this. A clear statement of purpose is an essential foundation for improving quality. Its absence in this case made the Review Team uncertain about UAF's sense of identity and purpose in doctoral education."

UA Response:

- Certainly the rationale for doctoral education at the University of Arkansas does exist, but has not been collected in a single document. The Graduate School will write such a document and University Relations will produce a "Making the Case"-type publication for distribution to various constituencies.
- Having said that, however, it is clear that the mission of the U of A has long been focused on undergraduate and master's education. It will take a change in culture to achieve a fully-realized doctoral environment. The Walton gift, with its $100 million endowment for the Graduate School, is the best indicator that this change is underway.

Issue: Graduate Student Stipends

Consultants
(1). "Increase graduate student stipends to attract a greater number of students from outside the region."
(2). "Low stipend levels are apparently pervasive. The University recognizes the need to raise them and has moved in that direction."
(3). "Develop a practical program for achieving competitive stipend levels. A first step would be a realistic assessment, on a program by program basis, of who represents the competition and what kinds of stipends they offer."

UA Response:

- This has always been a major budget item for the Graduate School.
- However, with the generous Walton fund, we will be able to offer more competitive stipends to a significant number of students.
- We are increasing the submission of proposals for externally-funded grants, which will create more graduate assistant positions and will help increase stipend levels. The creation of the position of Associate Vice Provost for Research and the re-organization and renaming of the Office of Research Support and Sponsored Programs will help with this effort.

- The Vice Provost for Research will develop a plan for faculty research development. As part of this plan, we will do the assessment suggested by the consultants to determine the benchmark, best-fit stipend levels.

- Nonetheless, the need remains for increased state funding. There are core disciplines for which external grant funding is not likely and other programs where the very absence of attractive stipend levels will decrease the likelihood of external grant funding. Increases in state funding to the University of Arkansas are essential to create a first-rate doctoral institution.

Issue: Doctoral Program Development

Consultants:
(1). "UAF must clarify the statement of purpose for graduate education and identify the uniqueness of its programs."
(2). "Develop unique, distinctive programs that address regional and global issues."
(3). "Invest in programs to make them nationally recognized."
(4). "UAF does have opportunities to develop selectively, particularly in interdisciplinary or combined programs, and seems to be doing some of this now, particularly through the development of interdisciplinary programs."
(5). "Find ways that clearly identify the uniqueness of UAF programs. Try to focus on excellence in selected areas at the university and within particular programs. UAF cannot at this time compete in mainstream programs on a national scale."
(6). "Seek to develop unique, distinctive programs that address regional as well as more global issues and invest in making these programs world leaders. In the current state of the world and higher education, it is unlikely that these programs would be in mainstream disciplines; the inter- and multi-disciplinary programs that have already been developed at UAF are probably a better model for what makes sense at this time."
(7). "To illustrate, a useful role for the Graduate School would be to challenge programs to implement a process of continuous improvement. For example, each program should have clear and carefully defined goals specifying why it is uniquely important vis a vis other programs in the nation and the world. Rather than vague generalizations about excellence, such goals should include Measures of Excellence that are specific enough that a process for improvement could be built on them. For example, by specifying the sub-areas of strength in the program and how they compare to the competition, a clear plan for improvement in faculty hires, graduate student and postdoc recruitment, etc. can be created. If it is a program in the sciences where a significant proportion of graduates are employed in industry, the plan could involve getting feedback from graduates and employers, perhaps by establishing industrial advisory groups, that, within the appropriate sphere of graduate education, could ensure that graduates are even better prepared in the future. Instead of relying on reputational rankings, which are at best deeply flawed, a process of this kind would allow for true measures of program success. The University would be able to describe its achievements in meaningful terms."

APPENDIX J.
(con't.)

(8). "UAF is moving aggressively to develop interdisciplinary programs and this clearly is a useful direction for graduate education."

UA Response:

- The Graduate School will initiate a process to identify those doctoral programs at the University of Arkansas which are a) already excellent; b) capable of being excellent with a minimum expenditure of funds; c) capable of being excellent only with a large expenditure of funds. In order to accomplish this inventory, we will ask the program faculty, as part of the periodic program review, to explain how the mission of their program complements that of the college and university, and how the program addresses regional and global issues. Since mission statements tend to be generalized value statements, the program will also be asked to give concrete examples of how the faculty have already achieved goals related to this mission, and how they will continue to do so in the future. The program will explain how the program builds on its strengths to achieve these goals, and will explain both a) how this is consistent with top-notch benchmark programs and b) how this builds a program unique in its mission. Also included in this review must be the ways in which the program contributes to interdisciplinary synergy. Further, the program will identify weaknesses in its efforts to achieve these goals and will explain how the weaknesses can be addressed. While lack of resources is typically identified as the greatest impediment to change, the program will be encouraged to think creatively about existing opportunities that can be achieved without a large infusion of funds. The dean of the college will be asked to either endorse or not endorse the mission and goals, and will be required to state how he/she will support the actions to be taken by the program.
- The Provost and the Dean of the Graduate School will work with the appropriate academic deans to create a Memorandum of Understanding for each existing interdisciplinary program so as to stabilize resources available to those programs.

Issue: Doctoral Program Assessment

Consultants:
(1). "Strengthen the internal review process to re-examine program choices at appropriate intervals to build program quality on a continuous basis."
(2). "Increase graduate student enrollment and improve student retention and graduation."
(3). "Strengthen programs with existing resources by developing greater focus within program areas and continued program improvement."
(4). "The success of a public doctoral research university can be described in terms of responsibility. The university has a responsibility to determine which programs and program emphases it should offer in order to provide an effective balance that serves the needs of the state, the nation, and the world (remember that looking beyond the region or the state is intrinsic to doctoral education). It then must maintain a process

that reexamines these choices at appropriate intervals and works to strengthen program quality on a continuous basis. The state, an essential partner, has a responsibility to assist in determining needs, to provide the necessary resources, and to assist the university in communicating its necessarily complex mission to the public."
(5). "The Review Team's strongest recommendation is that the University reinforce its existing achievements with an even more rigorous internal process of setting goals, choosing focus areas, and building quality."
(6). "Many programs have relatively low enrollment, low doctoral productivity, and high rates of non-completion. To a considerable extent this is an indication of lack of resources, but the Review Team believes that added investment is a better choice than program elimination. Comprehensive research universities develop powerful synergies through the interrelatedness of research and graduate education across disciplines. For example, research in chemistry undergirds most of what happens in the life sciences, chemistry and physics are central to progress in materials sciences and engineering, computer science provides knowledge and tools that advance all sciences, and so on. UAF has approximately the minimum number of programs needed to secure the benefits of being a comprehensive research institution, but lacks the resources to get all of the benefits from interdisciplinary synergy. As noted elsewhere, there are steps that the University could take with existing resources to strengthen programs. These include greater focus within program areas, and a more dedicated effort to promote continuous improvement."

UA Response:

- The University has begun to rewrite its program review policy.
- The end point of the review process, following the recommendations of the University Program Review Committee, will be a meeting of the Provost, the Graduate Dean, the academic dean, and the department/program head/chair/director to finalize a five-year plan for the program to achieve the University's goals of teaching, research, and service. Each year, the five-year plan will form the basis for the department's annual review.
- During the course of this review, it is likely that, in some doctoral programs, intractable problems will be identified in program management and faculty participation. These programs may be characterized by low enrollment and low student completion rates, even in departments in which faculty are professionally productive. It will not be enough for the doctoral department to present itself as excellent based solely on the scholarship of its faculty. While there are some core programs that will probably never enroll large numbers of students, these programs must still demonstrate their ability to mentor and graduate those students they do enroll.

Issue: Data

Consultants: "Develop a data system that does the following:
(1). "Provides comprehensive information on student employment after graduation, including, for example, nature of work if in business/ industry and nature of employment (tenure track, institutional type) if in higher education.
(2). "Connects graduate faculty status (or another measure of faculty research and scholarly productivity) to number of active doctoral students
(3). Differentiates doctoral students from other graduate students with respect to stipends and drop-outs
(4). "Provides a uniform format across units for the presentation of data
(5). "Develops an approach to understanding "yield" with respect to graduate student acceptances. For example, what percent of the most desirable applicants, as determined by a program, actually enroll at UAF? Where else do they go and for what reasons?"

UA Response:

- The Graduate School has hired a staff person who will be responsible for creating such a data base (as soon as the conversion to PeopleSoft has been completed) and/or working with Institutional Research to make these data generally available.
- We will create an alumni survey to be administered on a recurring basis.

Issue: New Doctoral Programs

Consultants:
(1). "The review team acknowledged that UAF has been realistic about adding new degree programs and encouraged the administration to continue this approach by adding new programs only when necessary. The team concluded that UAF has the minimum number of doctoral programs needed for a comprehensive research university and that there is not a current need for new graduate programs."
(2). "The Review Team sees no evidence at this time of the need for new doctoral programs at UAF. The University has been careful and realistic about adding new programs in the past, and the Review Team is confident that the same approach will result in new programs being added if and when necessary."

UA Response:

- The University has initiated a new policy: Before new doctoral degrees may be proposed by a program faculty, a concept paper must be presented to and approved by the Graduate Dean and the Provost. The dean of the academic college or, in the case of interdisciplinary programs, all of the relevant academic
- deans must formally commit the necessary resources to the program – including library support, graduate assistantships, increased maintenance accounts, understanding of the impact on faculty member's performance, and

- so on. In the case of interdisciplinary programs, each dean must sign a Memorandum of Understanding committing him/her to the resources needed to effectively operate the program. As part of the MOU, each dean and department head/chair will indicate how participation in the interdisciplinary program will be factored into faculty workloads, yearly merit evaluations, and tenure/promotion.
- However, there are some new doctoral programs we anticipate proposing.

Issue: Elimination of the Ph.D. in Economics

Consultants: "The Review Team believes that the college should seriously consider discontinuing the doctoral program in economics; a total of two graduates in five years sets off alarm bells about the critical mass needed for quality."

UA Response:

- Discussions have been initiated. We acknowledge that this is the oldest Ph.D. on campus and the program's faculty is preparing a new initiative to revitalize the program with a special emphasis on the doctoral education of students from underrepresented areas.

Issue: Doctoral Student Placement & Employment

Consultants: "Rather than adding a position in graduate student recruitment, it might make more sense to have someone whose job is primarily concerned with student placement and employment. A topic of major interest and concern in graduate education over the past several years has been the employment of Ph.D.s, particularly with respect to assisting students in identifying a broad array of career opportunities in addition to the traditional ones in the Academy. Several institutions have developed programs in this general area, notable among them being the Universities of Chicago and Pennsylvania. In addition to providing data, this person could assist in translating graduate and employer views of program strengths and weaknesses back to departments. This could be emphasized by departments inviting former graduates back to participate in departmental seminars on jobs and careers. Having someone with such a role would be very consistent with improving recruitment, since placement is one of the things prospective students are most interested in."

UA Response:

- The Graduate School and the Career Services Center have begun working collaboratively on issues related to graduate student placement and employment. A graduate student position has been created to identify the needs on campus. It is our hope that this will become a full-time staff position as soon as funds are available.