ECONOMIC DEVELOPMENT AND POLICY CHANGE:

AN ASSESSMENT OF THE ECONOMIC

DEVELOPMENT ACTIVITIES OF

HIGHER EDUCATION

IN OKLAHOMA

By

CAROLYN A. TAYLOR

Bachelor of Arts
The University of Oklahoma
Norman, Oklahoma
1979

Master of Arts
The University of Oklahoma
Norman, Oklahoma
1992

Submitted to the Faculty of the
Graduate College of
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
May 1999

ECONOMIC DEVELOPMENT AND POLICY CHANGE:

AN ASSESSMENT OF THE ECONOMIC

DEVELOPMENT ACTIVITIES

OF HIGHER EDUCATION

IN OKLAHOMA

Thesis Approved:

Thesis Advisor

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to thank Dr. William Parle and Dr. Joel Jenswold for their unswerving encouragement, generosity and professional guidance over the last several years. I would also like to thank the other members of my committee, Dr. James Davis and Dr. Martin Burlingame for their time, support and expertise.

This dissertation is dedicated to my parents, Frank and JoAnne Miller, and grandparents, Al and Anne Loeffelholz and Frank and Ruth Miller, as well as my family, Stratton, Carson and Abbey Anne Taylor, for their love and support.

I am indebted to Nancy Lewis, Carla Thompson, Carolyn Monholland, Dawnelle Cowan and Patty Murray for the technical support and assistance they provided.

I owe special thanks to the following for their friendship and moral support over many years: Paula Roberts, Reda Jarvis, Barbara Asbury, Nancy Lewis, Malinda Brown, Jack Stout, Jim and Otie Ann Fried.

Special hero's include: Cal Hobson, Tom Manar, Larry Gish, Don Ross, Sid Hudson, Bernice Shedrick and Penny Williams.

Finally, grateful acknowledgement is made to the wisdom and inspiration provided by B.K. Shaw and Viola Smith.

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

Table Page

Table Page

CHAPTER 1

INTRODUCTION TO THE STUDY

Statement of the Problem

Universities play a valuable role in economic development, but that role is neither well defined nor easily understood. States and communities seeking to improve their economic fortunes are turning to universities to participate more fully in economic development. For their part, universities are promoting their own economic development agendas while trying to increase state and community support. It is too early to judge or even evaluate the effectiveness of these efforts. A first step is to document and gain insight and a better understanding of the current situation and analyze the factors that influence these relationships. This first step will assist researchers, higher education leaders, institutions and policy makers in the future.

Background of the Study

Public higher education economic/service/outreach policies and practices are being shaped by many factors including citizen commissions as well as legislative and executive actions.

A recent report by a citizen commission concluded:

> "Higher Education provides talented employees, technical assistance, and basic and applied research - all of which improve the productivity of the private business sector. The business sector in turn is the state's engine for economic growth. The two-way flow of knowledge between business and higher education must be facilitated—including commercialization of research and development activity. To improve the state's competitive position, higher education must identify potential growth industries, and then design career curriculum and work

> force development programs to fit the needs of targeted economic sectors. Higher education institutions must receive the funding needed to provide customized, firm-specific work force development programs at no cost to Oklahoma businesses. By educating and producing a highly skilled, highly desirable work force, Oklahoma can attract businesses with those kinds of jobs to our state. By partnering with state economic development specialists, higher education can help attract those businesses considering a move to Oklahoma or assist those expanding current operations within the state." (Citizens' Commission on the Future of Oklahoma Higher Education Report, October 1997, p. 1)

In response to the Commission's findings, the Oklahoma State Regents for Higher Education, the governing board for the Oklahoma State System of Higher Education, at their May 1998 meeting, awarded approximately $3.2 million in grants for economic development activities at 14 Oklahoma public colleges and universities. "This is the first time in state higher education history that incentive funding has been directly targeted to economic development activities on Oklahoma college and university campuses," said Chancellor Hans Brisch. "We believe that this grant program will help Oklahoma establish a stronger, more responsive economy because it closely links higher education resources with Oklahoma businesses, communities and state agencies," Brisch said ("State Regents," 1998, p. 1).

In addition to the actions of the Oklahoma State Regents for Higher Education, the most recently concluded session of the Oklahoma Legislature passed House Bill 2863 which was signed into law Monday, May 18, 1998. The bill gives colleges and universities an incentive to participate in business ventures with private enterprise. Titled the "Oklahoma Technology Transfer Act of 1998," the bill allows institutions of higher education in Oklahoma to own equity in a business venture. Institutions would be permitted to use the facilities and other resources, including the value of faculty time and expertise, to acquire the equity interest. "The difference between Oklahoma and booming

high-tech research and business centers is no longer a difference - the playing field has been leveled," Governor Frank Keating said during the bill signing ceremony. "Now Oklahoma's best and brightest professors and faculties from our universities can share technology with Oklahoma's private sector businesses" (Tulsa World, 1998, p. B 10).

State government officials agree that higher education is a good public investment. Public higher education's efforts to increase its relative share of revenue in period of fiscal stress is due to many factors but may indicate that the message of economic impact is being received and accepted at the state capitol. Colleges and universities are increasingly promoting themselves as institutions which impact regional, social and demographic dynamics, enhance regional economic conditions, and contribute to regional income and to the regional tax base. This potential for positive economic and social impact is likely to be perceived positively by governing bodies elected or appointed to distribute limited state funds to all types of important state programs as well as to institutions of higher education.

How active are Oklahoma colleges and universities in economic development activities, and how are they responding to these and other external forces? As the percentage of state and federal budgets allocated to higher education has declined, enrollment has increased, placing pressure on the institutions to work harder to maintain quality academic programs and obtain adequate resources (Southern Regional Education Board, 1994). As the cost of providing post secondary education continues to increase, institutions must respond to demonstrate their worth. Many colleges and universities are increasing their participation in economic development activities. Identifying these activities and the extent of participation in them will be helpful to the State of Oklahoma

as well as all colleges and universities that are seeking to expand their economic development activities in the future.

Purpose of the Study

The objective of this study was to gather and present empirical data to better understand and to inform decision-makers and researchers about the level and nature of involvement in economic development activity among academic institutions in Oklahoma, both public and private, to describe factors influencing this involvement, to examine the varying degree of their influence and, finally, determine to what degree related internal institutional policies had changed concomitant with the level of institutional involvement in economic development. Limited empirical data were available to inform institutions and government policy makers on this topic, yet significant commitments and requests are being made by academic institutions and government at all levels to involve institutions more directly in economic development activities.

While the needs grow and pressures intensify for colleges and universities of all kinds to become more active in economic development, these trends are examined according to type of institution and type of economic development activities.

Statement of Research Questions

All institutions of higher education in Oklahoma were selected as the population for this study (n = 44). The literature suggests that region, size, and type of institution might impact significantly the level of involvement in business-industry initiatives. All three variables were considered in association with the level of institutional involvement. A survey instrument was developed to gather information based on the following research

questions:

1. To what extent did institutions participate in selected economic development activities from 1988–1998?
2. Which external factor(s) influenced decisions to engage in selected economic development activities from 1988–1998?
3. To what extent have institutions strategically planned for selected economic development activities for 1998 and beyond?
4. Which external factors influenced institutional decisions to develop strategic plans for selected economic development activities?
5. What economic development activities have higher education institutions in Oklahoma been engaged in the past, present and plan to be in the future? How are specific activities associated with the type of institution?
6. What types of businesses are being served by the economic development activities of institutions of higher education in Oklahoma?
7. What are reported to be the "motivating" factors responsible for encouraging (or discouraging) increased institutional involvement in economic development activity among public institutions?
8. What, if any, change has occurred among selected academic policies associated with increasing institutional involvement in economic development activity?
9. In the opinion of the respondents, what is the role of higher education, if any, in economic development? What factors encourage or discourage involvement in economic development activities? What are the respondents' anticipated economic development activities for the future?

Expected Outcomes and Significance

This study documents the current role and activities of higher education institutions and economic development in the State of Oklahoma in order to expand the current literature and better identify the economic development contributions of higher education institutions. The intended outcomes of this study were to (a) identify the economic development activities of institutions over the past decade, (b) determine which external factors had influenced the decisions to participate in the activities, (c) determine if institutions had strategically planned for any involvement for the future and what external factors might have played a role in such decisions,(d) examine how economic development activities have changed over time, (e) identify what type of businesses are being served, (f) identify what factors that motivate or encourage institutions to become involved in economic development activities and (g) learn from institutional leaders what they perceive the role of higher education and economic development to be and what their institutional plans for the future include.

It was expected that this research would indicate that most institutions of higher education in Oklahoma were actively involved in various economic development activities and that these activities might differ between type of institution. It was further expected that the factors motivating or encouraging economic development activities in Oklahoma and any resultant changes in internal academic policies would parallel similar national and state studies. This information will present significant opportunities for further study and provide specific suggestions for policy makers in the future.

CHAPTER 2

REVIEW OF THE LITERATURE

Overview

Understanding the economic impact of colleges and universities has long been of interest to higher education administrators, policy makers and public officials. Higher education institutions carefully walk the line between the pursuit of the traditional academic mission and the need for contemporary relevance. Much of the literature on higher education and economic development falls into three general areas: (a) an historical overview of technical and community colleges, state universities and land grant institutions and the role of economic development; (b) the emerging roles of higher education in state economic development strategies; and (c) an analysis of different surveys and economic models as various means of measurement.

Historical

How active are colleges and universities in economic development activities today? Throughout history, higher education has made significant contributions towards economic development. Since their inception, colleges and universities have undergone major transformations, adapted to changes, and responded to societal, political, technological and economic demands. Their basic purposes, functions, and objectives have been a series of alternations by historical events and transitions leading to eras of reform. According to Clark Kerr (1994), the main purposes of higher education have

varied, "sometimes they have been service to the church, or to the ancient profession, or to an ideology, or to an aristocratic and/or affluent class, or to the efficiency and power of the nation-state" (p. 51). (McComas ,1992) states, "the century-long shift from an agrarian to an industrial to an information economy will accelerate. As storehouses, generators, and transmitters of information, universities will either lead the change or be its victim" (p. 38). Today colleges and universities are expected to respond to local, state, and national economic development and industrial competitiveness needs. Industry and academic partnerships are encouraged. Such partnerships are not a new feature in American higher education but appear to be changing in character, extent of collaboration, and number. Universities are generally not seen as primary sources of new business. For example, they hold only about 2% of the active patents (Udell, 1990). Yet, they are regarded as key to the mix that results in prosperity in an increasingly information-based economy (Brody, 1985).

State Strategies

Increasingly, higher education resources continue to become a growing part of state economic development strategies (Clarke, 1986; John, 1987; Osborne,1987). A comparative analysis of six statewide reports noted that each report made recommendations for additional funding for higher education primarily on the basis of a "close link between the health of the state's economy and the university" (Diabasio, 1986, p. 22). Another survey investigated all state initiatives that promoted technical innovation and economic growth (State Board for Higher Education, Maryland, 1986).

A recent survey, Transforming Post Secondary Education for the 21st Century (ECS, 1998), studied the perceptions of governors regarding the need to reshape their respective

higher education systems to meet fundamental state needs. Findings conclude that K-12 education, post secondary education and early childhood education/child care issues were judged the three highest priorities of governors. In terms of post secondary institutions, governors clearly felt that community and technical colleges were the most responsive sector of post secondary education to state needs. Perhaps most surprising was the positive light in which governors viewed proprietary colleges and universities. Forty-eight percent indicated that such institutions were "very responsive" or "responsive" to state needs, a higher rate than publicly-funded research universities or four-year colleges.

One study (Hansen, 1988) advocated capacity-building regional economic development policies that focused on "improvements in the quality of government, in the physical and social environment, and informal activities and networks, and especially, in human resource development," (p.116). The role of higher education in state economic development strategies was also cited as "the single, most effective approach to strengthening state economic development is for states to invest in education. Education in fact is the largest budget expenditure of the states" (Bernstein, 1986, p. 24). In addition, Bernstein emphasized that "linking colleges and universities to economic development is the hallmark and the immediate future of every industrialized country and in many developing nations" (p. 13).

The claim of interdependency between economic development and higher education has long been a recognized factor (Bernstein, 1986; Diabasio, 1986; Cisneros, 1995; NASULGC, 1997). Some disputed the existence of the relationship and claimed that higher education and state economic development activities are based on "assumptions of limited substantiation" (Miller and Clark, 1983, p. 1) and "information regarding the

relationship between higher education and economic development is limited" (Beachler, 1985, p. 1). Others maintained that "despite numerous studies which have been carried out during recent years, our knowledge of the actual performance of different university-industry interfaces continues to be patchy" (Stankiewicz, 1986, p. 96), and "while it would seem quite natural for the corporate side to conduct cost-benefit analyses, universities typically have no good handle on evaluating the impact and utility of their commercial partnerships" (Melchiori, 1984, p. 21). Tornatzky (1983, p. 9) voiced concerns regarding the lack of "well-grounded empirical or conceptual" attempts to describe the university-industry innovation process and noted that the "literature that does exist on university-industry technological interaction has been generally limited to case studies and anecdotes of 'success'." Fairweather (1990) was just as direct, "Despite the rapid growth of industry-university research relationships and the high expectations for them, little evidence exists that these mechanisms are effective in producing new companies, new jobs, or new products. Given the size of investment in many of these arrangements, the lack of information about costs, benefits, and impact is striking" (p. 7). Notwithstanding this observation, the state university and land grant institution missions have historically included public service and research as well as instruction and, thus, have become models of the most adaptive existing vehicles in higher education to meet increasing business, government, and community needs for involvement in economic development (Bernstein, 1986; 1982; Lynton and Elman, 1987; Matthews and Norgaard, 1984; NASULGC, 1997).

The literature recognizes the distinct and differing points of view of academe and industry. One point of view is whether the rise of activity and public discussion

associated with campus-corporate partnerships is another in a long line of educational fads. Others see it as an important development but suggest that the exploitation of the higher education asset for economic development purposes is "improvised and shortsighted" (Stankiewicz, 1986, p. 113) requiring a more fundamental evaluation of its impact on major academic functions. Relatively little research has been conducted on the subject of the potential conflict of agendas and missions. An exception, Fairweather (1989) concluded, "A university must ask itself whether and to what extent it should emphasize various missions. If undergraduate instruction is a major goal (even if not the primary one), a university should pursue liaisons with industry only if it is assured that instruction will in some way benefit (or at least not be harmed). The failure to resolve questions of purpose beforehand increases the likelihood that partnerships with corporations may move the university in undesirable directions. By relating its purposes to questions of organizational structure and contractual content, the university has some control over its future direction. Failing to do so leaves only the question of determining what the university has become" (p. 403).

From a policy analysis perspective, Slaughter asserts that, although corporate-campus relationships are presented as reciprocal, "corporations actually dominate," the payoff for higher education being indistinct and somewhat distant at best (Slaughter, 1990, pp. 186–187). She also observes that the related policy literature offers little "empirical evidence of direct linkages between university research and industrial innovation" (p. 13).

What price have some institutions paid for participation in economic development? According to Anders (1992), "To many outside of academe, universities are viewed as greedy public consultants and insincere in their efforts to broaden their support by

incorporating community economic concerns" (Anders, 1992, p. 78). Coupled with this perception has been increased attention and pressures facing colleges and universities concerning benefits and costs of programs and projects (Anders, 1992). Institutions of higher education have been under pressure to show their economic impact beyond employment and educational opportunities.

Some researchers have focused exclusively on the high technology university-industry research component of economic development (Breslin, 1986; Flynn, 1986; 1984; National Science Foundation (NSF)), while others aimed at identifying and analyzing university-industry research collaboration which promoted high technology (Baer, 1980; Logan, 1984; Blanton, 1987; Melchiori, 1984). Still others have been helpful in delineating the various roles of higher education in economic development and fundamental guidelines for establishing the role of higher education in linking technology to economic development (Miller and Clark, 1983; Anders, 1992); issues in financing higher education (Hoy and Bernstein, 1982); a survey of trends in state coordination of higher education (Glenny, 1985); the contributions to regional and state economic development by state universities and land grant institutions (NASULGC, 1997; Matthews and Norgaard, 1984); a survey of business, government, and higher education leaders on the role of higher education in economic development (National Conference of State Legislatures, 1984); a directory of economic development programs (AASCU, 1986 and 1997, Oklahoma State Regents for Higher Education, 1998); a survey identifying the existing technology transfer network of state extension services and technical universities (Clark and Dobson, 1989; Bradley, 1990); the role of urban universities in strategic economic development planning (Cisneros, 1995); the impact of American higher

education on infrastructure and state economic redevelopment (Beachler, 1985); dimensions of new university roles in economic development (Baldwin,1988; Chmura, 1987); ways to measure state economic performance through the involvement of higher education (Rosenberg, 1985;Grant Thornton, 1987); primary ways that states promote economic growth through involvement with higher education (Beyers, Johnson, & Stranaham, 1987; Osborne, 1987); higher education policies and economic growth in the American States (Jones and Vedlitz, 1988); and an assessment of state science and technology policies designated to promote economic development through higher education involvement (Schmandt and Wilson, 1988; Layzell and Lyddon, 1990).

Allan Ostar (1991) stated that "the best way to address the challenges presented by changing demographics, rapid advances in technology, and international competition is by creating innovative strategic partnerships among higher education, business, government and labor, and economic/community development organizations" (p. 56). Members of the American Association of State Colleges and Universities (AASCU) have recognized these responsibilities and have moved toward a more "Interactive University" (Ostar, 1991). The Interactive University has been characterized as developing partnerships with business and industry, local communities, labor, and government to stimulate economic development. "Everyone is a stakeholder in the Interactive University" (Ostar, 1991, p. 57).

Economic Models

Advocates of increasing industry-academe partnerships present a point of view summarized in an SRI International, Public Policy Center report:

> Higher education can meet the new demands imposed by government and industry in ways that enhance their traditional missions. Development of new

> roles that contribute to economic development can enable these institutions to develop new alliances with industry and government, expand their resource base, enhance their ability to attract and educate students, develop stimulating and useful research opportunities, and fulfill public service obligations (AASCU, 1986, p. vii)

As the percentage of state and federal budgets allocated to higher education declined, enrollment has increased, placing pressure on the institutions to work harder to maintain quality academic programs and obtain adequate resources (Southern Regional Education Board, 1994). As the cost of providing post secondary education continues to increase, institutions must respond to demonstrate their worth. (Alfred, 1982). Most institutions can readily produce reports detailing enrollment trends, the number of graduates, and other information related to their academic mission (Clark, 1993). However, institutions may not have available information describing their economic impact on their local community, information which could prove useful in influencing the deliberations of budget-makers (Simmons, 1992). An economic impact study provides an institution of higher education a procedure to document its economic contribution to the local community (Caffrey & Isaacs, 1971; Goldstein, 1990).

The economic impact of higher education include both "forward and backward linkages" (Hudson, 1974; Stokes, 1996; Knott, 1988). Forward linkages are the result of higher education that enhances the general level of human capital development and provides important region-relevant knowledge that helps with regional development. However, the most commonly referred to economic impact studies are backward linkages, in the form of business given to local suppliers who benefit from higher education expenditures such as the Caffrey and Isaacs model.

Caffrey and Isaacs (1971) reported that previous economic impact studies "by individual schools, while similar in conception and methodology, lacked real

comparability in both methodology and economic consideration" (p.2). The authors noted that previous studies had not followed similar procedures. As a response, they developed a new model. According to much of the literature and subsequent studies, the Caffrey and Isaacs economic impact model is acknowledged as the predominant model used in the determination of the economic impact of a university on its surrounding community. The Caffrey and Isaacs model is organized into three major sections, each representing the institution's economic impact on a specific segment of the local economy: (a) the economic impact of the college or university on the local business, (b) the economic impact of the college or university on local government, (c) and the economic impact of the college or university on local individuals. Forward linkages are longer term and geographically more broadly distributed in their impact, while the backward linkages are more immediate in time and in their return to the local area.

Economic development has been understood to be the process by which under developed nations or less advanced regional economies are accelerated toward parity with more advanced, generally more prosperous, societies. From a financial perspective, economic development is seen as a "process by which interested individuals and organizations are inspired to invest capital in an area" (Northeast-Midwest Institute, 1988, p. 101). Today, particularly when referring to higher education's role, economic development is understood to be "a process of innovation that increases the capacity of individuals and organizations to produce goods and services and thereby create wealth" (AASCU, 1986, p. x).

Works Most Useful to This Study

The American Association of State Colleges and Universities (AASCU, 1986)

The American Association of State Colleges and Universities (AASCU) has taken an active leadership role in identifying and promoting higher education economic development activities as well as the National Association of State Universities and Land-Grant Colleges (NASULGC).(AASCU, 1986; NASULGC, 1997)

The AASCU study found in its survey of over 300 of America's four-year, public colleges and universities, most all institutions encounter pressure to play a more active role in the economic development of the nation's cities, states and regions. AASCU believes that institutions can meet the new demands imposed by government and industry in ways that enhance their traditional missions. Developing new roles that contribute to economic development enables institutions to develop new alliances with industry and government, expand their resource base, enhance their ability to attract and educate students, develop stimulating and useful research opportunities, and fulfill public service obligations. The study also noted that many factors influence an institution's involvement in economic development and the specific roles it develops. Some factors are internal to the institution such as research needs, education needs, public service requirements and political needs. Others are external such as industry, state government and local community needs as well as demographic shifts, resource constraints and societal pressures. Additionally, the study acknowledges potential dangers for colleges and universities seeking to become more active in economic development such as unrealistic expectations, conflicts of interest, weakened teaching roles, distorted priorities of the institution and that academic freedoms could be threatened.

The American Association of State Colleges and Universities (AASCU, 1986) member survey noted that some institutions developed a full range of objectives while others focused on one or two, depending upon interest and capacity, and described the following university objectives in economic development:

1. Human resource development - tailoring education programs to meet the emerging human resource requirements of the new economy.
2. Economic and policy analysis and research – providing objective information and new knowledge to public and private decision-makers about an area's economy.
3. Capacity-building for economic development - assisting a wide variety of community organizations in developing the capacity to participate more effectively in economic development.
4. Technical assistance to apply existing knowledge to industry – helping firms learn about and adopt effective management and engineering concepts.
5. Research to develop new knowledge - conducting basic and applied work to produce new knowledge that can result in new products and services or improved forms of production.
6. Technology transfer of new developed knowledge to industry – purposefully helping firms to take advantage of state-of-the-art technology developed within the university.
7. Support for the development of new knowledge-based businesses - having the university take a direct role in promoting new enterprises that utilize knowledge developed within the university.

Major conclusions of the AASCU study that are relevant to this study include:

1. College and university involvement in economic development works most

effectively when it supports and compliments an institution's primary mission. The study notes that different types and locations of higher education institutions differ in their involvement in economic development activities.

2. There are key factors that support or hinder an institution's participation and successful involvement in economic development activities.

The study warns that the current public interest in colleges and university involvement in economic development is no passing fad but, rather, represents a fundamental shift in society's view of higher education. The authors state that unless public colleges and universities develop appropriate and effective roles in economic development, many will find that state, community and industry leaders will either begin to impose restrictions or turn to other institutions for their knowledge-related needs.

The Cote Study (Cote, 1993)

While the AASCU study surveyed four-year institutions, the Cote study surveyed the 72 land grant institutions. Similar conclusions were drawn. Key factors were found to support institutional involvement in economic development activities, specifically, changes in related internal policies and procedures to accommodate such involvement. In addition, factors which influenced institutions' decisions regarding economic development involvement were identified.

Both the Cote and AASCU studies found the surveyed colleges and universities involvement in economic development activities to be increasing. A variety of factors are thought to stimulate interest in economic development among academic institutions to motivate or provide rationales for institutions to be become more directly in economic development initiatives. The limited empirical data that are available include a National

Science Foundation sponsored survey of 39 universities and 56 companies. Reported in 1983, the study found that diversifying the institution's funding base, student exposure to real-world research problems, and better overall training for graduates were among the factors most often cited (NSF, 1983). Institutional policy facilitative of faculty involvement in economic development activities is also considered to be an important factor (Linnell, 1982) (Cote, 1993). The American Association of State Colleges and Universities (AASCU) survey indicated that leadership, special resources and administrative flexibility are among leading factors supportive of economic development involvement (AASCU, 1986).

Summary and Conclusions

Higher education is crucial to the continued economic growth of the various states and American economy. However, the review of literature reveals a disturbing trend in the level of federal, state, and local involvement of economic development activities with institutions of higher education. Specifically, economic models to measure economic impact as well as standardized and accepted methods of survey techniques designed to gather information appear nonexistent or outdated. At the same time, an increasing number of states and institutions are engaging in various methods to quantify their economic development activities. These are primarily in the form of economic impact studies.

Additionally, there is a general acceptance that the benefits of higher education involvement in economic development activities far outweigh any negative consequences. The proponents of the use of academe as a tool for economic development greatly outnumber the skeptics. Beyond the question of whether or not industry-

university partnerships can achieve economic gains is the fundamental question of whether institutions should embrace these activities. Business and university relationships are not inherently contradictory to academic instructional and research goals. However, much more research and analysis is called for to assess the impact on institutional involvement in economic development activities both internally within colleges and universities as well as externally. An initial step, for purposes of this study, is to identify the factors motivating institutional involvement in economic development enterprises, identify the nature of these activities, and resultant changes in internal academic policies and procedures.

CHAPTER 3

METHODOLOGY

Research Design

The purpose of this study was to examine the economic development activities of higher education institutions in Oklahoma and to identify the external factors that influenced the participation in these activities. In addition, the study sought to identify whether these colleges and universities had developed strategic plans and what external factors influenced their decision to do so. The study identified the activities of institutions by type of institution in the past, present and for the future and identified the type of businesses being served. Motivating factors were identified that encouraged economic development activities as well as changes in academic policies.

Presidents of all public and private institutions of higher education were selected for participation in the study. A survey instrument was developed to address the research questions presented in Chapter 1.

Research Method

A mail survey that addressed the research questions identified in Chapter 1 was mailed to all 44 presidents of public and private institutions in Oklahoma (Appendix A). The survey (Appendix B) consisted of closed-ended questions with a Likert-type scale to measure responses concerning the type of various economic development activities, strategic planning, perceptions of the influence of external factors, and level of participation in economic development activities.

Using open-ended questions, the survey assessed the respondents' perceptions of the role of higher education institutions in economic development, encouraging or discouraging factors, and likely activities for the future. Institutions provided information on the extent of existing policies and changes in academic policies in a "yes/no" format. Finally, the survey requested the respondents to rate the degree of influence that each of the 36 motivational factors had with regard to increasing economic development activity.

An influence score was calculated as the mean of the 21 respondent ratings for each of the 36 motivational factors. Respondents also circled an arrow adjacent to each of the factors indicating whether they perceived that the individual factor encouraged, discouraged, or was neutral with regard to consideration of increasing their institution's involvement in economic development activity. An encouragement score was calculated as the sum of the 21 respondents for each factor.

Accompanying the mail survey was a cover letter (Appendix C) stating the importance of the research, encouraging participation and assuring confidentiality. Follow-up phone conversations encouraged an increase in the return rate.

Data Collection

Since the entire population was surveyed, instead of a sample, the research results should have been an accurate description of the economic development activities in Oklahoma. However, given the low response rate of the private institutions (4 of 15), the study more accurately reflects the activities of the public institutions. Follow-up with all of the private institutions generally revealed either lack of time or willingness to respond, or, as in most cases with the theological institutions, economic development activities

were not a part of their stated mission or purpose. Because the research surveyed the entire population from one state with an economic environment that may differ from that of other states, generalizations may not be made accurately, and conclusions may not be applicable to higher education institutions in other parts of the country.

The survey questions and categories of economic development activities were developed based on a review of the literature, earlier studies (Cote, 1993; AASCU, 1986; Wigginton, 1996), discussions with the staff at the Oklahoma State Regents for Higher Education, and with several experts in the field of economic development at various institutions in Oklahoma. In addition, a pilot survey was conducted to test and refine the survey instrument. Categories of economic development activities with examples include:

Applied Research	The Center for Economic and Management Research, The University of Oklahoma Food Product Development, Oklahoma State University The Applied and Environmental Microbiology Program, The University of Oklahoma Business Research Center, Cameron University
Business Development	The Center for Entrepreneurship, Oklahoma State University
Copyrights, Patents, Trademarks	The Patent and Trademark Depository, Oklahoma State University
Data Collection and Dissemination	The Biological Survey and Mesonet, The University of Oklahoma The Center for Agriculture and Environment, Oklahoma State University
Education, Training and Management, Workforce Development	The Business and Industrial Development Department, Oklahoma City Community College. The American Institute of Banking Programs, Rose State College The Center for Entrepreneurship, Southeastern Oklahoma State University

Funding Procurement	The Small Business Innovation Research (SBIR) Funding Programs administered by the Oklahoma Center for the Advancement of Science and Technology
General Technical Assistance	The Institute for Telecommunications, Oklahoma State University The Center for Urban and Regional Studies, The University of Oklahoma
International Trade	The Center for International Trade Development, Oklahoma State University The Office of Globalization, University of Central Oklahoma The International Language Center, Tulsa Community College
Networking and Partnerships	The Center for Business and Economic Development, The University of Oklahoma The Northeastern Oklahoma Manufacturers' Council OSU Technical Branch-Okmulgee
Research and Development	The Engineering Institute and Research Lab, The University of Oklahoma The Medical Laser Lab, Oklahoma State University The Health Research Program administered by the Oklahoma Center for the Advancement of Science and Technology
Rural Development	The Rural Enterprise Team, Oklahoma State University
Technology Transfer	The Oklahoma Center for Integrated Design and Manufacturing, Oklahoma State University The Office of Research Administration, The University of Oklahoma Health Sciences Center
Research Parks/Incubators	Swearingen Research Park The University of Oklahoma

The reliability of this research, however, is dependent upon the development of a survey instrument. Factors that could contribute to errors may include question wording

and content as well as vagueness in the survey instructions. In addition, limitation exists concerning the survey respondents. Although the survey instrument was mailed to presidents of all higher education institutions in Oklahoma, the task of responding to the survey was, in some cases, delegated to other institutional administrators. Considering these factors, however, the study has merit. First, the response rate was high among public institutions (21of 29). Second, the institutional administrators who responded appeared able to access the information about activities in which the institution was engaged. Finally, the study was designed toward economic development activities specific to Oklahoma.

Data Analysis

Data analysis included both content and quantitative analysis. Content analysis of pilot study results and a review of the literature were used to identify and define the parameters of the survey instrument. Descriptive data were provided through the narrative responses to open-ended questions. Content analysis was used to identify categories as well as to analyze verbatim listings of responses.

A quantitative analysis of the survey results was conducted to determine the extent of economic development activity and the influence of external forces and motivating factors. Frequency distributions for the closed-ended questions were tabulated per question and by type of institution. The following Oklahoma State Regents for Higher Education categorization of type of public institution was utilized:

Comprehensive University	University of Oklahoma Oklahoma State University
Regional I University	University of Central Oklahoma East Central University Northeastern State University

	Southeastern Oklahoma State University Southwestern Oklahoma State University Cameron University
Regional II University	Langston University Northwestern Oklahoma State University Oklahoma Panhandle State University University of Science and Arts of Oklahoma
Two Year Colleges, Rural	Carl Albert State College Connors State College Eastern Oklahoma State College Murray State College Northeastern Oklahoma A&M College Northern Oklahoma College Redlands Community College Rogers University, Claremore Seminole State College Western Oklahoma State College
Two Year Colleges, Urban	Oklahoma City Community College Rose State College Tulsa Community College
Technical Branches	OSU Technical Branch, OKC OSU Technical Branch, Okmulgee
Constituent Agencies	OU Health Science Center OSU College of Osteopathic Medicine

The purpose of this study was to measure responses from administrators by type of Oklahoma colleges and universities (independent variables), current economic development involvement, and motivations (dependent variables) and to compare the responses to earlier studies.

CHAPTER 4

PRESENTATION OF THE DATA

Introduction

The object of this study was to gather information on the past, present and anticipated future economic development activities of higher education institutions in Oklahoma (public and private), and to determine which external factors (social/cultural, political, economic, and technological) influenced the development process. The study also sought to discover if the institutions were developing strategic plans to enhance their anticipated future economic development activities. The study examined changes in academic policies and the relationship in increased economic development activity. Finally, the study identified the motivating factors for encouraging increased institutional involvement in economic development activities.

Characteristics of the Respondents

There are currently 44 institutions of higher education in Oklahoma. Twenty-nine are public institutions and 15 are private institutions. The Economic Development and Policy Change Survey was mailed to the presidents of all 44 institutions on July 24, 1998. Twenty-five institutions of higher education responded to the survey instrument for a response rate of 57%. Of the public institutions, 21 institutions responded for a response rate of 72%. Four of the private institutions responded for a response rate of 26%. All of the responses were usable and representative of the population surveyed.

Presidents represented 33.3% of the respondents of public institutions, Vice

Presidents for Academic Affairs represented 9.5% of the respondents, Vice Presidents for Business or Financial Affairs represented 4.8% of the respondents, and other vice Presidents or Deans represented the remaining 52.4%. Presidents represented 50% of the respondents of private institutions while other institutional staff responded to the remaining 50%. Eighty-four percent of the respondents were public institutions ($\underline{n} = 21$), and 16% were private institutions ($\underline{n} = 4$). Nine and one half percent of the respondents represented comprehensive universities, 23.8% represented regional I universities, 14.3% represented regional II universities, 28.6% represented two-year rural community colleges, 14.3% represented two-year urban community colleges, 4.8% represented technical branches, and 4.8% represented constituent agencies.

The researcher developed a coding system for the survey instrument and entered the data into SPSS for Windows™, a computerized software package for statistical analysis of data.

Research Question One

To what extent did institutions participate in selected economic development activities from 1988–1998? How are specific activities associated with the type of institution?

Respondents were asked to describe their institution's level of effort towards the thirteen economic development activities between 1988 and 1998. Respondents were asked to identify the level of effort given these activities using a Likert-type scale which included "not at all," "minimal effort," and "major effort." The ratings were coded with numeric values for purposes of analyzing the data with 1 signifying "not at all," 2 signifying "minimal effort," and 3 signifying "major effort."

The economic development activities in which Oklahoma's colleges and universities were engaged between 1998–1998 are summarized in Table 1 as they relate to effort. The

list of activities used to represent effort in economic development in this study was developed from the literature on university-industry interaction, from discussion with the staff at the Oklahoma State Regents for Higher Education and with several experts in the field of economic development at various institutions. Responses indicated variation among institutions, some very involved in virtually all specified activities, others involved in few, if any.

TABLE 1

Economic Development Activity Effort, 1988-1998

Public and Private Institutions (N = 25)

	Public and Private						
Activity	Not at all		Minimal effort		Major effort		Total
	f	%	f	%	f	%	%
Applied research	10	(40.0)	8	(32.0)	7	(28.0)	100
Business development	4	(16.0)	12	(48.0)	9	(36.0)	100
Copyrights, patents and trademarks	14	(56.0)	8	(32.0)	3	(12.0)	100
Data collection and dissemination	5	(20.0)	12	(48.0)	8	(32.0)	100
Education, training and management, workforce development			9	(36.0)	16	(64.0)	100
Funding procurement	9	(36.0)	7	(28.0)	8	(32.0)	100
General technical assistance	4	(16.0)	11	(44.0)	10	(40.0)	100
International trade	14	(6.0)	8	(32.0)	3	(12.0)	100
Networking and partnerships	5	(20.0)	5	(20.0)	15	(60.0)	100
Research and development	10	(40.0)	9	(36.0)	6	(24.0)	100

Public and Private							
Activity	Not at all		Minimal effort		Major effort		Total
	f	%	f	%	f	%	%
Rural development	8	(32.0)	12	(48.0)	5	(20.0)	100
Technology transfer	8	(32.0)	8	(32.0)	9	(36.0)	100
Research parks/incubators	14	(56.0)	9	(36.0)	2	(8.0)	100

Public institution's responses are summarized in Table 2.

TABLE 2

Economic Development Activity Effort, 1988-1998

Public Institutions (n = 21)

Public and Private							
Activity	Not at all		Minimal effort		Major effort		Total
	f	%	f	%	f	%	%
Applied research	7	(33.3)	7	(33.3)	7	(33.3)	100
Business development	2	(9.5)	10	(47.6)	9	(42.9)	100
Copyrights, patents and trademarks	11	(52.4)	7	(33.3)	3	(14.3)	100
Data collection and dissemination	3	(14.3)	10	(47.6)	8	(38.1)	100
Education, training and management, workforce development			6	(28.6)	15	(71.4)	100
Funding procurement	7	(33.3)	6	(28.6)	7	(33.3)	100
General technical assistance	2	(9.5)	10	(47.6)	9	(42.9)	100
International trade	11	(52.4)	7	(33.3)	3	(14.3)	100
Networking and partnerships	3	(14.3)	4	(19.0)	14	(66.7)	100
Research and development	8	(38.1)	7	(33.3)	6	(28.6)	100

Public and Private							
Activity	Not at all		Minimal effort		Major effort		Total
	f	%	f	%	f	%	%
Rural development	4	(19.0)	12	(57.1)	5	(23.8)	100
Technology transfer	6	(28.6)	8	(38.1)	7	(33.3)	100
Research parks/incubators	11	(52.4)	8	(38.1)	2	(9.5)	100

Table 3 summarizes and ranks responses to the 13 selected activities that define "effort." A numerical score was created for each activity of all public institutions. By calculating the mean of these activities, they were ranked in terms of involvement from high to low. Education, training and management, and workforce development were the economic development activities that public institutions ranked as the highest followed by networking and partnerships, business development, general technical assistance and data collection and dissemination. Activities least engaged in by public institutions were technology transfer, rural development, applied research, research and development, funding procurement, copyrights, patents and trademarks, international trade and research parks/incubators.

TABLE 3

Summary of Institutional Involvement in Economic Development Activities

For 13 Selected Activities: Public Institutions (n = 21):

Public Institutions				
			Frequency	
Activity	Mean	Std. Dev.	Minimum	Maximum
Education, training and management, workforce development	2.71	.46	1	3

Public Institutions				
			Frequency	
Activity	Mean	Std. Dev.	Minimum	Maximum
Networking and partnerships	2.52	.75	1	3
Business development	2.33	.66	1	3
General technical assistance	2.33	.66	1	3
Data collection and dissemination	2.24	.70	1	3
Technology transfer	2.05	.80	1	3
Rural development	2.05	.67	1	3
Applied research	2.00	.84	1	3
Research and development	1.90	.83	1	3
Funding procurement	1.90	.94	1	3
Copyrights, patents and trademarks, international trade	1.62	.74	1	3
Research parks/ incubators	1.57	.68	1	3

The data reported for each economic development activity is summarized by type of activity in terms of level of effort over the past decade . The type of public institution reportedly most often engaged in each type of economic development activity is also noted.

Applied Research

Of all the respondents, 40% indicated that, between 1988 and 1998, their institution's effort towards participating in applied research was non existent. Another 32% responded

that a minimal effort was given to this economic development activity. Only 28% of all public and private institutions indicated a major effort was directed toward this activity. Of the public institutions, an equal 33.3% was applied to each level of activity. The types of public institutions which indicated the strongest effort in applied research activities include the comprehensive institutions and constituent agencies.

Business Development

The majority, 48%, of all respondents, indicated minimal effort toward business development. A major effort was reported by 36% and only 16% reported no activity. A high percentage of public institutions reported minimal effort, 47.6%, and a major effort was indicated by 42.9%. Few public institutions, 9.5%, reported no activity. The type of public institutions which indicated the strongest effort in business development activities include the comprehensive institutions and two year urban institutions.

Copyrights, Patents and Trademarks

Only 12% of all institutions indicated a major effort for copyrights, patents and trademarks. The majority, 56%, showed no activity and 32% reported minimal effort. Public institutions reported 52.4 % did not participate, 33.3 % were involved at a minimal effort level and 14.3 % gave a major effort to this activity. The type of public institutions which indicated the strongest effort in copyrights, patents and trademarks were the comprehensive universities and constituent agencies.

Data Collection and Dissemination

Data collection and dissemination efforts ranked a minimal effort by 48% of all the respondents. A major effort was reported by 32% and 20% responded no effort at all. The public institutions responded by 38.1% of engaging in a major effort, 47.6% in a mininal

effort and only 14.3% in nothing at all. The type of public institutions which indicated the strongest effort in data collection and dissemination were the comprehensive universities, the regional II universities, and the technical branches.

Education, Training and Management, Workforce Development

The strongest activity reported by all respondents was in the area of education, training and management, and workforce development. A healthy 64% reported a major effort and 36% reported a minimal effort. Of the public institutions, over 71% reported a major effort and 28.6% indicated a minimal effort. The type of public institutions which reported the strongest effort in education, training and management and workforce development were the comprehensive universities, regional I universities, two-year rural institutions, two-year urban institutions, and technical branches.

Funding Procurement

A fairly even division of effort was reported for funding procurement. Of all respondents, 36% said no involvement, 28% reported a minimal effort and 32% reported a major effort. The public institutions were evenly split with 33.3 % indicating no involvement and 33.3% with a major effort. Slightly over 28% responded with a minimal effort. The type of public institutions which reported the strongest efforts in funding procurement were the comprehensive universities.

General Technical Assistance

By a large margin of all respondents, 84%, reported a minimal effort or major effort in the area of general technical assistance. Only 16% showed no activity. The public institutions indicated 42.9% participated in a major effort, and 47.6% in a minimal effort. Only 9.5% did not participate. The type of public institutions which reported the

strongest efforts in general technical assistance were the regional I universities, and the technical branches.

International Trade

Most institutions, 56%, did not participate in international trade. Only 32% reported a minimal effort, and even fewer, 12%, a major effort. The majority of public institutions, 52.5%, responded that they exercised no effort in the area of international trade, 33.3% of minimal effort and 14.3% of a major effort. None of the public institutions reported any strength in this area.

Networking and Partnerships

Total respondents, 60%, indicated that a major effort was given to networking and partnerships. Only 20% indicated a minimal effort and again only 20% indicated no effort. Of the public institutions, a strong 66.7% showed a major effort, and only 19% indicated a minimal effort while 14.3% reported exercising no effort The type of public institutions which reported the strongest efforts in the networking and partnerships were the regional II universities, two-year urban institutions, and technical branches.

Research and Development

The majority of public and private institutions, 40%, reported no involvement in research and development. Thirty-six percent indicated a minimal effort, and 24% showed a major effort. Of public institutions, 38.1% said they were not involved, 33.3% reported minimal effort and 28.6% indicated a major effort. The type of public institutions that reported the strongest efforts in research and development were the comprehensive universities and constituent agencies.

Rural Development

Most respondents, 48%, reported minimal effort regarding rural development. Many, 32%, indicated no effort and only 20% reported a major effort. Most public institutions, 57.1%, indicated a minimal effort, while 23.8% showed a major effort. Only 19% did not participate The type of public institutions which reported the strongest efforts in rural development were the regional II universities and the two-year rural institutions.

Technology Transfer

A consistent response was indicated for all institutions regarding technology transfer. Thirty-two percent reported no involvement, 32% reported minimal effort and 36% reported major effort. Of the public institutions, 28.6%, reported no effort, 38.1% reported minimal effort and 33.3% reported major effort. The type of public institutions that reported the strongest efforts regarding technology transfer were the technical branches and constituent agencies.

Research Parks/Incubators

Finally, most institutions, 56%, did not participate in research parks or incubator projects. Thirty-six percent reported a minimal effort, and only 8% expressed a major effort. Of the public institutions, 52.4% were not involved; 38.1 % reported a minimal effort; and 9.5 % indicated a major effort. Of the public institutions, only the constituent agencies reported a strong effort in this area of activity.

Tables 4–10 summarize and rank each economic development activity discussed above by type or public institution.

TABLE 4

Economic Development Activity Effort, 1988-1998, by Type of Public Institution:

Comprehensive University (n = 2)

	Comprehensive university			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Research and development	1	3	3.00	.00
Funding procurement	1	3	3.00	.00
Education, training and management, workforce development	1	3	3.00	.00
Data collection and dissemination	1	3	3.00	.00
Copyrights, patents and trademarks	1	3	3.00	.00
Business development	1	3	3.00	.00
Applied research	1	3	3.00	.00
Research parks/ incubators	1	3	2.50	.71
Technology transfer	1	3	2.50	.71
Rural development	1	3	2.50	.71
Networking and partnerships	1	3	2.50	.71
International trade	1	3	2.50	.71
General technical assistance	1	3	2.00	1.41

TABLE 5

Economic Development Activity Effort, 1988-1998, by Type of Public Institution:

Regional I University (n = 5)

	Regional university I			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
General technical assistance	1	3	2.80	.45
Education, training and management, work development	1	3	2.80	.45
Networking and partnerships	1	3	2.20	.84
Data collection and dissemination	1	3	2.20	.84
Business development	1	3	2.20	.84
Applied Research	1	3	2.20	.84
Technology Transfer	1	3	2.00	1.00
Research and development	1	3	2.00	1.00
Rural development	1	3	1.80	.45
Research parks/incubators	1	3	1.60	.55
International trade	1	3	1.60	.55
Copyrights, patents and trademarks	1	3	1.40	.55
Funding procurement	1	3	1.20	.84

TABLE 6

Economic Development Activity Effort, 1988-1998, by Type of Public Institution: Regional II University (n = 3)

	Regional university II			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Networking and partnerships	1	3	3.00	.00
Data collection and dissemination	1	3	2.67	.58
Rural development	1	3	2.33	.58
Research and development	1	3	2.33	.58
Business development	1	3	2.33	.58
Technology transfer	1	3	2.00	.00
General technical assistance	1	3	2.00	.00
Education, training, and management, workforce development	1	3	2.00	.00
Applied research	1	3	2.00	1.00
Funding procurement	1	3	1.67	1.15
Copyrights, patents and trademarks	1	3	1.67	.58
Research parks/incubators	1	3	1.00	.00
International trade	1	3	1.00	.00

TABLE 7

Economic Development Activity Effort, 1988-1998, by Type of Public Institution: Two-year Rural (n = 6)

Activity	Two-year rural Minimum	Maximum	Mean	Std. Dev.
Education, training and management, workforce development	1	3	2.83	.41
Networking and partnerships	1	3	2.50	.84
Rural development	1	3	2.33	.82
General technical assistance	1	3	2.33	.52
Business development	1	3	2.17	.75
Technology transfer	1	3	2.00	.89
Funding procurement	1	3	2.00	.89
Data collection and dissemination	1	3	1.83	.41
Research parks/incubators	1	3	1.50	.55
Research and development	1	3	1.50	.55
International trade	1	3	1.50	.84
Applied research	1	3	1.50	.84
Copyrights, patents and trademarks	1	3	1.17	.41

TABLE 8

Economic Development Activity Effort, 1988-1998, by Type of Public Institution
Two-year Urban (n = 3)

	Two-year rural			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Networking and partnerships	1	3	3.00	.00
Education, training and management, workforce development	1	3	3.00	.00
Business development	1	3	3.00	.00
Funding procurement	1	3	2.67	.58
International trade	1	3	2.33	.58
General technical assistance	1	3	2.33	.58
Data collection and dissemination	1	3	2.33	.58
Rural development	1	3	1.67	.58
Applied research	1	3	1.67	.58
Technology transfer	1	3	1.33	.58
Research and development	1	3	1.33	.58
Copyrights, patents and trademarks	1	3	1.33	.58
Research park/ incubators	1	3	1.00	.00

TABLE 9

Economic Development Activity Effort, 1988-1998, by Type of Public Institution
Technical Branch (n = 1)

	Technical branch			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Technology transfer	1	3	3.00	
Networking and partnerships	1	3	3.00	
General technical assistance	1	3	3.00	
Education, training and management, workforce development	1	3	3.00	
Data collection and dissemination	1	3	3.00	
Research parks/incubators	1	3	2.00	
Rural development	1	3	2.00	
Copyrights, patents and trademarks	1	3	2.00	
Business development	1	3	2.00	
Applied research	1	3	2.00	
Research and development	1	3	1.00	
International trade	1	3	1.00	
Funding procurement	1	3	1.00	

TABLE 10

Economic Development Activity Effort, 1988-1998, by Type of Public Institution
Constituent Agency (n = 1)

	Constituent agency			
Activity	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Research Parks/Incubators	1	3	3.00	
Technology transfer	1	3	3.00	

Constituent agency				
Activity	Minimum	Maximum	Mean	Std. Dev.
Research and development	1	3	3.00	
Copyrights, patents and trademarks	1	3	3.00	
Applied research	1	3	3.00	
Funding procurement	1	3	2.00	
Education, training and management, workforce development	1	3	2.00	
Rural development	1	3	1.00	
Networking and partnerships	1	3	1.00	
International trade	1	3	1.00	
General technical assistance	1	3	1.00	
Data collection and dissemination	1	3	1.00	
Business development	1	3	1.00	

Research Question Two

Which external factor(s) influenced institutional decisions to engage in selected economic development activities from 1988-1998?

Respondents were asked to identify which external factors influenced their institution to engage in the 13 economic development activities between 1988–1998. For each economic development activity, respondents were asked to check all external factors that applied. For data analysis purposes, numeric values, consisting of 1 signifying "yes" and 2 signifying "no," were assigned to responses. Table 11 provides a summary of external factor influence on the selected economic development activities between 1988-1998.

TABLE 11

External Factor Influence on Economic Development Activities: Public and Private
(N = 25)

Public and Private								
Activity	**Social/ cultural**		**Political**		**Economic**		**Technological**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Applied research	5	(20)	6	(24)	9	(36)	12	(48)
Business development	14	(56.0)	6	24)(	17	(68.0)	8	(32.0)
Copyrights, patents and trademarks	4	(16.0)	2	(8.0)	6	(24.0)	4	(16.0)
Data collection and dissemination	10	(40.0)	11	(44.0)	12	(48.0)	7	(28.0)
Education, training and management, workforce development	17	(68.0)	14	(56.0)	18	(72.0)	15	(60.0)
Funding procurement	8	(32.0)	6	(24.0)	11	(44.0)	5	(20.0)
General technical assistance	10	(40.0)	9	(36.0)	13	(52.0)	14	(56.0)
International trade	5	(20.0)	4	(16.0)	7	(28.0)	5	(20.0)
Networking and partnerships	12	(48.0)	13	(52.0)	16	(64.0)	11	(44.0)
Research and development	8	(32.0)	7	(28.0)	11	(44.0)	11	(44.0)
Rural development	11	(44.0)	12	(48.0)	12	(48.0)	9	(36.0)
Technology transfer	4	(16.0)	6	(24.0)	10	(40.0)	17	(68.0)
Research parks/incubators	4	(16.0)	3	(12.0)	7	(28.0)	6	(24.0)

Table 12 indicates public institutions' responses.

TABLE 12

External Factor Influence on Economic Development Activities:

Public Institutions (n = 21)

	Public							
External factor	**Social/ cultural**		**Political**		**Economic**		**Technological**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Applied research	5	(23.8)	6	(28.6)	9	(42.9)	11	(52.4)
Business development	13	(61.9)	6	(28.6)	17	(81.0)	7	(33.3)
Copyrights, patents and trademarks	3	(14.3)	2	(9.5)	6	(28.6)	4	(19.0)
Data collection and dissemination	9	(42.9)	11	(52.4)	12	(57.1)	6	(28.6)
Education, training and management, workforce development	15	(71.4)	14	(66.7)	17	(81.0)	15	(71.4)
Funding procurement	6	(28.6)	6	(28.6)	11	(52.4)	5	(23.8)
General technical assistance	9	(42.9)	9	(42.9)	13	(61.9)	13	(61.9)
International trade	4	(19.0)	4	(19.0)	6	(28.6)	4	(19.0)
Networking and partnerships	11	(52.4)	13	(61.9)	16	(76.2)	10	(47.6)
Research and development	7	(33.3)	7	(33.3)	11	(52.4)	10	(47.6)
Rural development	11	(52.4)	12	(57.1)	12	(57.1)	9	(42.9)
Technology transfer	4	(19.0)	6	(28.6)	10	(47.6)	15	(71.4)
Research parks/incubators	3	(14.3)	3	(14.3)	7	(33.3)	6	(28.6)

The data reported for each economic development activity is summarized by type of activity in terms of type of external factor(s) over the past decade.

Applied Research

Technological factors were the greatest influence on applied research activity. Of the total respondents, 48% indicated that over the ten year period, technological factors influenced their institution's decision to participate in applied research activities. The majority of public institutions, 52.4%, reported the influence of technological factors with economic factors influential as well by 42.9%.

Business Development

Business development activities were strongly influenced by both economic factors, 81%; by social/cultural factors, 60%; by public institutions. Both factors remained strong as reported by all institutions.

Copyrights, Patents and Trademarks

Low indications of influence was reported by all respondents for this activity. Twenty-eight percent of the public institutions reported that economic factors influenced their participation in copyrights, patents, and trademarks.

Data Collection and Dissemination

Public institutions reported social/cultural, political, and economic factors provided significant influence with 42.9%, 52.4%, and 57.1%, respectively.

Education, Training and Management, Workforce Development

Over 65% was shown by all factors to influence this type of economic development activity by public institutions. Economic factors were the greatest at 81% with social/ culture and technological factors both at 71.4%. Political factors were also an influence

with 66.7% reporting to be a factor

Funding Procurement

Economic factors were the greatest influence among public institutions, accumulating more than twice the value of any of the other three factors.

General Technical Assistance

All four factors were influential in public institution's participation. Economic and technological factors were both strong factors at 61.9% each. Social/cultural and political factors were each 42.9%.

International Trade

Slight levels of influence were reported by public institutions in all factors. Economic factors were the greatest at 28.6% while social/cultural, political and technological all were influenced by 19% each. Political factors were of no influence on private institutions on their decision to participate international trade or any other economic development activity.

Networking and Partnerships

All public institutions were influenced by over 50% from each factor. Economic factors were the strongest at 76.2%. Political factors were a close second by 61.9%.

Research and Development

Economic factors played the strongest influence on the decision to engage in research and development activities by public institutions at 52.4%. Technological influences were a second at 47.6%. Less influential were social/cultural factors and political factors, each at 33.3%.

Rural Development

All four factors were relatively uniform in their influence on rural development activities. Political and economic factors each received 57.1% and social/cultural and technological between 42–52 %.

Technology Transfer

Technological factors far outweighed any other factor at 71.4% of public institutions. Economic factors were second at 47.6

Research Parks/Incubators

Economic and technological factors were greatest among public institutions.

Research Question Three

To what extent has institutions strategically planned for selected economic development activities for 1998 and beyond?

In exploring this research question, respondents were asked to what extent their institution has strategically planned for each of the thirteen economic development activities specified for 1998 and beyond. For data analysis purposes respondents were asked to identify the level of planning given these activities using a Likert-type scale which included "not at all," "minimal effort," and "major effort." The ratings were coded with numeric values for purposes of analyzing the data with 1 signifying "not at all," 2 signifying "minimal effort," and 3 signifying "major effort." Indications of strategic planning for 1998 and beyond are summarized in Table 13.

TABLE 13

Strategic Planning Effort for the Future: Public and Private Institutions (N = 25)

	Public and Private					
Activity	**Not at all**		**Minimal effort**		**Major effort**	
	f	**%**	**f**	**%**	**f**	**%**
Applied research	9	(36.0)	6	(24.0)	9	(36.0)
Business development	2	(8.0)	5	(20.0)	15	(60.0)
Copyrights, patents and trademarks	10	(40.0)	11	(44.0)	2	(8.0)
Data collection and dissemination	5	(20.0)	4	(16.0)	14	(56.0)
Education, training and management, workforce development	2	(8.0)	2	(8.0)	19	(76.0)
Funding procurement	8	(32.0)	3	(12.0)	12	(48.0)
General technical assistance	3	(12.0)	7	(28.0)	12	(48.0)
International trade	9	(36.0)	8	(32.0)	6	(24.0)
Networking and partnerships	2	(8.0)	4	(16.0)	17	(68.0)
Research and development	6	(24.0)	11	(44.0)	7	(28.0)
Rural development	4	(16.0)	9	(36.0)	10	(40.0)
Technology transfer	5	(20.0)	8	(32.0)	11	(44.0)
Research parks/incubators	10	(40.0)	9	(36.0)	5	(20.0)

As shown in Table 14, public institutions planning efforts for the future are greatest in the areas of business development; data collection and dissemination; education, training and management, workforce development; and networking and partnerships.

TABLE 14

Strategic Planning Effort for the Future: Public Institutions (n = 21)

	Public and Private					
Activity	**Not at all**		**Minimal effort**		**Major effort**	
	f	**%**	**f**	**%**	**f**	**%**
Applied research	7	(33.3)	4	(19.0)	9	(42.9)
Business development	2	(9.5)	4	(19.0)	14	(66.7)
Copyrights, patents and trademarks	8	(38.1)	9	(42.9)	2	(9.5)
Data collection and dissemination	3	(14.3)	4	(19.0)	12	(57.1)
Education, training and management, workforce development			2	(9.5)	17	(81.0)
Funding procurement	6	(28.6)	3	(14.3)	10	(47.6)
General technical assistance	1	(4.8)	7	(33.3)	10	(47.6)
International trade	7	(33.3)	6	(28.6)	(6)	(28.6)
Networking and partnerships			2	(9.5)	17	(81.0)
Research and development	4	(19.0)	9	(42.9)	7	(33.3)
Rural development	1	(4.8)	8	(38.1)	10	(47.6)
Technology transfer	3	(14.3)	8	(38.1)	9	(42.9)
Research parks/incubators	7	(33.3)	8	(38.1)	5	(23.8)

Research Question Four

Which external factors influenced institutional decisions to develop strategic plans for selected economic development activities?

Respondents were asked to identify which external factors influenced their institution's decision to develop a strategic plan for the thirteen economic development activities. For data analysis purposes, numeric values were assigned to responses consisting of 1 signifying "yes" and 2 signifying "no." External factor influences on strategic planning are summarized in Table 15 for public and private institutions.

TABLE 15

External Factor Influence on Strategic Planning: Public and Private Institutions (N = 25)

	Public and Private							
Activity	Social/ cultural		Political		Economic		Technological	
	f	%	f	%	f	%	f	%
Applied research	8	(32.0)	5	(20.0)	11	(44.0)	9	(36.0)
Business development	14	56.0)	13	(52.0)	19	(76.0)	13	(52.0)
Copyrights, patents and trademarks	3	(12.0)	3	(12.0)	5	(20.0)	5	(20.0)
Data collection and dissemination	11	(44.0)	11	(44.0)	13	(52.0)	10	(40.0)
Education, training and management, workforce development	18	(72.0)	16	(64.0)	18	(72.0)	13	(52.0)
Funding procurement	6	(24.0)	8	(32.0)	10	(40.0)	7	(28.0)
General technical assistance	9	(36.0)	10	(40.0)	14	(56.0)	15	(60.0)
International trade	3	(12.0)	4	(16.0)	4	(16.0)	4	(16.0)

Public and Private								
Activity	Social/ cultural		Political		Economic		Technological	
	f	%	f	%	f	%	f	%
Networking and partner-ships	13	(52.0)	15	(60.0)	18	(72.0)	15	(60.0)
Research and development	7	(28.0)	10	(40.0)	12	(48.0)	11	(44.0)
Rural development	9	(36.0)	12	(48.0)	11	(44.0)	12	(48.0)
Technology transfer	5	(20.0)	10	(40.0)	11	(44.0)	17	(68.0)
Research parks/incubators	2	(8.0)	5	(20.0)	8	(32.0)	9	(36.0)

External influences on strategic planning among public institutions are greatest in the activities of business development; education, training and management, workforce development; and networking and partnerships as indicated in Table 16.

TABLE 16

External Factor Influence on Strategic Planning: Public Institutions (n = 21)

Public and Private								
Activity	Social/ cultural		Political		Economic		Technological	
	f	%	f	%	f	%	f	%
Applied research	7	(33.3)	5	(23.8)	11	(52.4)	8	(38.1)
Business development	13	(61.9)	13	(61.9)	18	(85.7)	13	(61.9)
Copyrights, patents and trademarks	2	(9.5)	3	(14.3)	5	(23.8)	5	(23.8)
Data collection and dissemination	10	(47.6)	11	(52.4)	13	(61.9)	9	(42.9)
Education, training and management, workforce development	16	(76.2)	16	(76.2)	18	(85.7)	13	(61.9)
Funding procurement	6	(28.6)	8	(38.1)	9	(42.9)	6	(28.6)

Public and Private								
Activity	Social/ cultural		Political		Economic		Technological	
	f	%	f	%	f	%	f	%
General technical assistance	9	(42.9)	10	(47.6)	14	(66.7)	13	(61.9)
International trade	2	(9.5)	4	(19.0)	4	(19.0)	4	(19.0)
Networking and partner-ships	13	(61.9)	15	(71.4)	17	(81.00	14	(66.7)
Research and development	7	(33.3)	10	(47.6)	12	(57.1)	10	(47.6)
Rural development	9	(42.9)	12	(57.1)	11	(52.4)	11	(52.4)
Technology transfer	5	(23.8)	10	(47.6)	11	(52.4)	16	(76.2)
Research parks/incubators	2	(9.5)	5	(23.8)	8	(38.1)	8	(38.1)

In addition, respondents were asked how often each of the external factors influenced their institution's decisions to pursue economic development activities that are innovative and somewhat entrepreneurial. Respondents were asked to identify the frequency of these factors using a Likert-type scale that included "never," "occasionally" and "often." The ratings were coded with numeric values for purposes of analyzing the data with 1 signifying "never," 2 signifying "occasionally," and 3 signifying "often." Frequency of the external factors is summarized in Tables 17 for both public and private institutions.

TABLE 17

External Factors Influence on Innovative and Entrepreneurial Economic Development Activities: Public and Private Institutions (N = 25)

Public and Private							
External Factors	Never		Occasionally		Often		Total
	f	%	f	%	f	%	%
Social/Cultural	3	(12)	12	(48)	9	(36)	(100)
Economic	2	(8)	6	(24)	17	(68)	(100)

Public and Private							
External Factors	**Never**		**Occasionally**		**Often**		**Total**
	f	**%**	**f**	**%**	**f**	**%**	**%**
Technological	3	(12)	7	(28)	15	(60)	(100)
Political	4	(16)	16	(64)	5	(20)	(100)

Economic and Technological factors have a greater influence than political or social/cultural factors on the development of innovative and entrepreneurial activities among public institutions as indicated in Table 18.

TABLE 18

External Factors Influence on Innovative and Entrepreneurial Economic Development Activities: Public Institutions (n = 21)

External Factors	**Never**		**Occasionally**		**Often**		**Total**
	f	**%**	**f**	**%**	**f**	**%**	**%**
Social/Cultural	1	(4.8)	11	(52.4)	8	(38.1)	(100)
Economic			6	(28.6)	15	(71.4)	(100)
Technological	1	(4.8)	7	(33.3)	13	(61.9)	(100)
Political			16	(76.2)	5	(23.8)	(100)

Research Question Five

What economic development activities have public higher education institutions in Oklahoma been engaged in the past, present and plan to be in the future? How are specific activities associated with the type of institution?

This research question was explored by asking respondents to identify specific economic development activities in which their institutions participated in the past (prior to 1994), the present (1994–1998) or plan to be in the future (beyond 1998). For data

analysis purposes, a numeric value was assigned to responses consisting of 1 signifying "yes" and 2 signifying "no."

Public institutions are summarized in Table 19.

TABLE 19

Specific Economic Development Activity Involvement: Public Institutions (n = 21)

	Public					
Activity	Past (prior to 1994)		Present (1994-1998)		Future (beyond 1998)	
	f	%	f	%	f	%
Human resource development	17	(81.0)	20	(95.2)	20	(95.2)
Economic research and analysis	13	(61.9)	12	(57.1)	14	(66.7)
Capacity building	15	(71.4)	16	(76.2)	17	(81.0)
Technical assistance	15	(71.4)	18	(85.7)	18	(85.7)
Research	9	(42.9)	9	(42.9)	12	(57.1)
Technology transfer	10	(47.6)	13	(61.9)	16	(76.2)
New business development	9	(42.9)	9	(42.9)	16	(76.2)

The data reported for each economic development activity is summarized by type of activity and by type of public institution.

Human Resource Development

Human resource development activities by public institutions have increased from 81% to 95% from the past, prior to 1944, to the present. Planning remains the same for this activity for the future at 95.2%. The amount of human resource development activities appears to remain fairly constant from the past to the present and for the future

among the comprehensive institutions, two-year rural, technical branches, and constituent agencies. A slight decrease in activity was reported by the regional I universities and two-year urban institutions while a slight increase was seen by the regional II institutions.

TABLE 20

Involvement in Human Resource Development Activity by Type of Public Institutions (n = 21)

	Human resource development		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	11.8%	10.0%	10.0%
2 (Regional I university) f - 5	23.5	20.0	20.0
3 (Regional II university) f - 3	11.8	15.0	15.0
4 (Two-year rural) f - 6	29.4	30.0	30.0
5 (Two-year urban) f - 3	17.6	15.0	15.0
6 (Technical branch) f - 1		5.0	5.0
7 (Constituent agencies) f - 1	5.9	5.0	5.0
Total	81.0%	95.2%	95.2%

Economic Research and Analysis

Economic research and analysis activities are reported to be increasing by the public institutions. In the past, 61.9% reported involvement and 66.7% report plans to be in the future. Minimal increases or decreases are generally reported for all types of public institutions.

TABLE 21

Involvement in Economic Research and Analysis Activity by Type of Public Institution (n = 21)

	Economic research and analysis		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	15.4%	16.7%	14.3%
2 (Regional I university) f - 5	15.4	16.7	21.4
3 (Regional II university) f - 3	23.1	16.7	21.4
4 (Two-year rural) f - 6	23.1	25.0	21.4
5 (Two-year urban) f - 3	15.4	16.7	14.3
6 (Technical branch) f - 1	7.7	8.3	7.1
7 (Constituent agencies) f - 1			
Total	61.9%	57.1%	66.7%

Capacity Building

Capacity building activities are reported to be slightly increasing for public institutions from 71.4% in the past to an anticipated 81% for the future. Regional II universities report the greatest increase in activity from 6.7% in the past to 17.6% for the future. All other types of institutions report a slight decrease in these activities.

TABLE 22

Involvement in Capacity Building Activity by Type of Public Institution (n = 21)

	Capacity building		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	13.3%	12.5%	11.8%
2 (Regional I university) f - 5	20.0	18.8	17.6
3 (Regional II university) f - 3	6.7	12.5	17.6
4 (Two-year rural) f - 6	33.3	31.3	29.4
5 (Two-year urban) f - 3	20.0	18.8	17.6
6 (Technical branch) f - 1	6.7	6.3	5.9
7 (Constituent agencies) f - 1			
Total	71.4%	76.2%	81.0%

Technical Assistance

In the future technical assistance activities will hold at their current level of involvement, 85.7%, by public institutions. Technical assistance activities were reported to be increased slightly by regional II institutions, two-year rural institutions and two-year urban institutions. Slight decreases are anticipated by the comprehensive institutions, regional I universities, and technical branches.

TABLE 23

Involvement in Technical Assistance Activity by Type of Public Institution (n = 21)

	Technical assistance		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	13.3%	11.1%	11.1%
2 (Regional I university) f - 5	26.7	22.2	22.2
3 (Regional II university) f - 3	13.3	16.7	16.7
4 (Two-year rural) f - 6	26.7	27.8	27.8
5 (Two-year urban) f - 3	13.3	16.7	16.7
6 (Technical branch) f - 1	6.7	5.6	5.6
7 (Constituent agencies) f - 1			

Technical assistance			
Type	Past (prior to 1994)	Present (1994-1998)	Future (beyond 1998)
Total	71.4%	85.7%	85.7%

Research

Public institutions reported a 42.9% response to activities in the past and in the present. A significant increase is anticipated for the future, growing to 57.1%. Regional I universities, two-year rural institutions and technical branches plan to increase activities. Slight decreases are seen by the other types of public institutions.

TABLE 24

Involvement in Research Activity by Type of Public Institution (n = 21)

Research			
Type	Past (prior to 1994)	Present (1994-1998)	Future (beyond 1998)
1 (Comprehensive university) f - 2	22.2%	22.2%	16.7%
2 (Regional I university) f - 5	11.1	11.1	16.7
3 (Regional II university) f - 3	22.2	22.2	16.7
4 (Two-year rural) f - 6	22.2	22.2	25.0
5 (Two-year urban) f - 3	11.1	11.1	8.3
6 (Technical branch) f - 1			8.3

	Research		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
7 (Constituent agencies) f - 1	11.1	11.1	8.3
Total	42.9%	42.9%	57.1%

Technology Transfer

Technology transfer activities have seen a consistent increase in commitment as reported by public institutions. A level of 47.6% was reported for the past. Present activities are engaged in by 61.9% of the institutions, and 76.2% plan to be engaged in these activities in the future. Increases in activities are seen by regional II institutions, two-year rural institutions and two-year urban institutions. Slight decreases were reported by the comprehensive universities, regional I universities, technical branches and constituent agencies.

TABLE 25

Involvement in Technology Transfer Specific Economic by Type of Public Institution (n = 21)

	Technology transfer		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	20.0%	15.4%	12.5%
2 (Regional I university) f - 5	20.0	15.4	12.5
3 (Regional II university) f - 3	10.0	15.4	18.8

Technology transfer			
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
4 (Two-year rural) f - 6	20.0	23.1	31.3
5 (Two-year urban) f - 3	10.0	15.4	12.5
6 (Technical branch) f - 1	10.0	7.7	6.3
7 (Constituent agencies) f - 1	10.0	7.7	6.3
Total	47.6%	61.9%	76.2%

New Business Development

New business development activities for public institutions remained the same in the past as the present, both at 42.9%. An increase to 76.2% is planned for the future. Significant increases in activities were reported for the future by the regional II universities and two-year rural institutions. Slight increases are anticipated by the comprehensive universities and two-year urban institutions. Decreases in activity are reported by the regional I universities, technical branches and constituent agencies.

TABLE 26

Involvement in New Business Development by Type of Public Institution (n = 21)

	New business development		
Type	**Past (prior to 1994)**	**Present (1994-1998)**	**Future (beyond 1998)**
1 (Comprehensive university) f - 2	11.1%	22.2%	12.5%
2 (Regional I university) f - 5	33.3	33.3	25.0
3 (Regional II university) f - 3	11.1	11.1	18.8
4 (Two-year rural) f - 6	11.1	11.1	18.8
5 (Two-year urban) f - 3	11.1	11.1	12.5
6 (Technical branch f - 1	11.1		6.3
7 (Constituent agencies) f - 1	11.1	11.1	6.3
Total	42.9%	42.9%	76.2%

Research Question Six

What types of businesses are being served by the economic development activities of institutions of higher education in Oklahoma?

The types of businesses being served by the economic development activities of institutions are reported in Table 27. Manufacturing, wholesale/retail and government/education were the recipients of most of the public institutions' economic development efforts.

TABLE 27

Type of Business Served by Economic Development Activities in 1998:

Public and Private Institutions

	Percent of type of business served by institutions	
Type of Business	**Public and Private (N = 25)**	**Public (n = 21)**
Agriculture	6.68	7.95
Manufacturing	15.40	18.33
Construction	2.84	3.38
Health Services	9.92	11.76
Other Services	11.28	10.10
Wholesale/Retail Trade	12.00	14.29
Finance/insurance/real estate	7.48	8.90
Transportation/communications/ utilities	8.24	9.33
Government/education	18.24	15.95
Total	100%	100%

The number of employers served in fiscal year 1998 by these activities are summarized in Table 28. The largest percentage of public institutions served over 200 employers in fiscal year 1998.

TABLE 28

Private Sector Employers Service in 1998: Public and Private Institutions

Number of employers	Percent of institutions: Public and Private (N = 25)		Public (n = 21)	
	f	%	f	%
None	1	(4.0)		
1 - 9	4	(16.0)	3	(14.3)
10 - 24	6	(24.0)	5	(23.8)
25 - 49	2	(8.0)	2	(9.5)
50 - 99	2	(8.0)	1	(4.8)
100 - 199	2	(8.0)	2	(9.5)
200+	7	(28.0)	7	(33.3)

The number of employees impacted directly or indirectly by the employers served is reported in Table 29.

TABLE 29

Number of Employees Impacted: Public and Private Institutions

Number of employees	Percent of institutions: Public and private (N = 25)		Public (n = 21)	
	f	%	f	%
None	1	4.0		
1 - 99	3	12.0	2	(9.5)
100 - 499	6	24.0	5	(23.8)
500 - 999	4	16.0	4	(19.0)
1,000 - 4,999	5	20.0	4	(19.0)
5,000 - 9,999				

Number of employees	Percent of institutions: Public and private (N = 25) f	%	Public (n = 21) f	%
10,000 - 14,999				
15,000 - 19,999				
20,000 - 24,999				
25,000+	5	(20.0)	5	(23.8)

Revenue generated for the institutions by these activities are reported in Table 30.

TABLE 30

Gross Revenue Generated in 1998: Public and Private Institutions (N = 25)

Gross revenue	Percent of institutions: Public and Private (N = 25) f	%	Public (n = 21) f	%
None	3	(12.0)	2	(9.5)
$1-49,000	2	(8.0)	2	(9.5)
$50,000 - 99,999	4	(16.0)	3	(14.3)
$100,000 - 499,999	4	(16.0)	2	(19.0)
$500,000 - 999,999	5	(20.0)	3	(14.3)
$1 -1.49 million	2	(8.0)	2	(9.5)
$5 - 9.9 million				
$10+ million	4	(16.0)	4	(19.0)

Research Question Seven

What are reported to be the motivating factors responsible for encouraging (or discouraging) increased institutional involvement in economic development activity among public institutions?

When asked to indicate the level of institutional involvement in economic development over the preceding ten years, 90.5% of the respondents of public institutions (n = 21) reported involvement to be increasing.

The survey requested the respondents to rate the degree of influence that each of the 36 motivational factors had upon discussions and/or decisions with regard to increasing economic development activity at their institutions within the past ten years. A mean influence score was calculated as the mean of the 21 respondent ratings for each of the 36 motivational factors, with 1 signifying "no influence" and 5 signifying "great influence."

Respondents also circled an arrow adjacent to each of the 36 motivational factors indicating whether they perceived that the individual factor encouraged (scored as +1), discouraged (scored as –1), or was neutral (scored as 0) with regard to consideration of increasing their institution's involvement in economic development activity. A factor encouragement score was calculated as the sum of the 21 respondents' ratings for each individual factor.

As summarized in Table 31, institutions reported the extent to which factors influenced institutions' decisions regarding economic development involvement. Factors such as point of view of the president, of business leaders, of state legislators/ government; having a strategic plan; wanting to improve public relations and image; transmitting knowledge through nontraditional teaching; increasing state appropriations;

meeting public service obligations; generating new knowledge; and increasing corporate involvement appear to be the most influential. Factors related to recruitment of students, increasing faculty publishing, and augmenting faculty salaries were seen to have little influence on decisions related to the level of the institutions' involvement in economic development.

The degree to which each of the 36 factors encouraged increasing an institutions' economic development involvement also varied greatly as indicated by the encouragement scores ranging from a high of 21 to a low of -1. Those factors perceived as more influential were generally also seen as supportive of increased involvement.

TABLE 31

Motivational Factors Influencing Economic Development Involvement: Public Institutions (n = 21)

			Public		
Motivational factors	**Mean influence score**	**Encouragement score**	**Frequency**		
			Encouraging	**Discouraging**	**Neutral**
Points of view of institutional presidents	4.62	21	21		
Point of view of business leaders	4.00	21	21		
Point of view of state leg./govt.	4.00	19	20	1	
Strategic, long-term planning process	3.81	19	19		2

Public

Motivational factors	Mean influence score	Encouragement score	Frequency		
			Encouraging	Discouraging	Neutral
Improving public relations and image	3.76	20	20		1
Transmission of knowledge through nontraditional teaching (distance education, conference, etc.	3.76	17	17		4
Increasing state appropriations to the institution	3.67	19	19		2
Meeting public service obligations	3.62	19	19		2
Generating new knowledge and aiding curriculum development	3.62	18			3
Increasing corporate involvement and/or gifts to the institution	3.57	20	18		1

Public

Motivational factors	Mean influence score	Encour-agement score	Frequency		
			Encour-aging	Discour-aging	Neutral
Assisting start-up business and/or providing technical assistance to established companies	3.48	17	17		4
Founding purposes, charter of mission of the institution	3.38	15	15		6
Point of view of the board of trustees/ regents	3.38	17	17		4
Point of view of the local elected officials/gov-ernment	3.33	18	18		3
Enhancing faculty development	3.29	18	18		3
Better use of real property	3.19	19	19		6
Improving research and instructional equipment and other instructional support	3.14	15	15		6

Public

Motivational factors	Mean influence score	Encour-agement score	Frequency		
			Encouraging	Discour-aging	Neutral
Point of view of faculty	3.14	11	11		10
Attracting federally supported research	3.05	15	15		6
Recruiting, retraining faculty	3.05	15	15		6
Transfer of technology, discovery in commerce	2.90	15	15		6
Accommo-dating faculty entrepre-neurial activity	2.90	12	12		9
Recruiting noncredit students	2.76	13	13		8
Fund raising among alumni and other individuals	2.76	13	13		8
Point of view of alumni	2.71	9	9		12
Increasing industry-sponsored research	2.67	13	13		8

Public

Motivational factors	Mean influence score	Encour-agement score	Frequency		
			Encouraging	Discour-aging	Neutral
Academic freedom of inquiry and open exchange of information	2.62	7	7		14
Ability of faculty to augment their base salaries	2.52	10	10		11
Increasing faculty publishing activity	2.48	8	8		13
Proprietary rights, inventions, discoveries	2.43	10	10		11
Recruiting undergradu-ate students	2.38	9	9		12
Tax exempt status of the institution	2.00	6	6		15
Recruiting graduate students	1.95	6	7		13
Revenue generation through equity participating in commercial ventures, related direct investment	1.90	7	8	1	12

Public					
Motivational factors	**Mean influence score**	**Encour-agement score**	**Frequency**		
			Encouraging	**Discour-aging**	**Neutral**
Potential liabilities of commerciali-zation of research	1.76	-1	2	3	16

Research Question Eight

What, if any, change has occurred among selected academic policies associated with increasing institutional involvement in economic development activity?

Respondents were asked to indicate the extent to which their institutions had been or are currently involved in selected activities defined as (a) creation of a patent and licensing office, (b) addition of staff in a patent and licensing office, (c) development of a public relations campaign to inform possible licensees of inventions available for licensing by the institution, (d) efforts to make faculty more aware of the commercial applications of any inventions they developed, (e) use of an outside patent firm to seek license arrangements or (f) creation of an outside entity to undertake development and technology transfer of inventions such as non-profit research centers or for-profit corporations. Respondents were also asked to indicate if their institution had made any changes in selected academic policies defined as patents, consulting, conflict of interest, and conflict of commitment and extra compensation.

For purposes of analysis, an Economic Development Involvement (EDI) Score was calculated as a measure of institutional involvement in economic development activities. The EDI score for each institution was determined by the sum of responses given for the 13 selected economic development activities detailed in the survey. The ratings were

coded with numeric values for purposes of creation of the EDI score with 1 signifying "not at all," 2 signifying "minimal effort," and 3 signifying "major effort." Table 32 includes in its left-hand column the EDI scored for each of the public institutions (39 signifying high involvement to 15 signifying low involvement). In addition, each institution was coded by type into the following groups: (a) Type 1 = comprehensive university, (b) Type 2 = regional I university, (c) Type 3 = regional II university, (d) Type 4 = 2-year rural institution, (e) Type 5 = 2-year urban institution, (f) Type 6 = technical branch, (g) Type 7 = constituent agency.

As Table 32 indicates, no significant relationship is found between the level of economic development activity and the involvement or changes among selected academic policies. In addition, there appears to be no relationship between the level of economic development activity and type of institution, with the exception of the comprehensive universities, which do have a greater overall level of activity.

TABLE 32

Economic Development Activity and Academic Policy Change: Public Institutions (n = 21)

Institution listed in order of economic development involvement score[a]	Type of Institution[b]	Involvement of Current Activities: Patent & licensing offices	Addition of staff	Public relations	Commercial application	Outside firm	New entity	Changed Policies: Patents	Consulting	Conflict of interest	Conflict of commitment	Extra compensation
39	1	x	x	x	x		x	x		x	x	
35	4											
34	2							x	x	x	x	x
32	2							x				x
32	1	x	x	x	x		x	x	x	x	x	x
30	5											
29	3											
29	4				x	x	x		x	x		x
28	6							x	x			
28	5											
27	3											
25	7	x	x		x	x	x		x	x		x
25	2											
25	4											
25	4											
23	5											x
22	3				x							
22	4											
20	2						x					
19	2								x			x
15	4											

[a]Calculated as the sum of involvement ratings (1, not involved; 2, minimal effort; 3, major effort) in 13 selected economic development activities.

[b]Type 1 = comprehensive university; type 2 = regional 1 university; type 3 = regional 2 university; type 4 = two-year rural; type 5 = two-year urban; type 6 = technical branch; type 7 = constituent agency.

Research Question Nine

What are the respondents' anticipated economic development activities for the future? In the opinion of each respondent, what is the role of higher education, if any, in economic development? What factors encourage or discourage involvement in economic development activities?

This research question was explored by first asking respondents what they believe to be their institution's most important economic development activities for the future? An open-ended question was used to obtain this information. The researcher analyzed the responses from all public institutions and used the following categories to group the responses. Each response was identified and grouped into following categories: (a) human resource development, (b) economic research and analysis, (c) capacity building, (d) technical assistance, (e) research, (f) technology transfer, (g) new business development.

Human resource development ranked overwhelmingly the highest with 18 responses. Capacity building ranked second with eight responses. Respondents equally identified technical assistance, research and technology transfer with six responses each. Least identified activities for the future were new business development with three responses and economic research and analysis with two responses.

This research question was further explored by asking respondents the open-ended question "What is the role of higher education, if any, in economic development?" While the responses were varied in wording, generally speaking the content was similar and often interrelated. All of the public institutions reported having a role in economic development. A large majority of the respondents stated the major role was to provide

employers with an educated workforce, fulfill the mission of the institution, provide leadership, build community partnerships, conduct research and share technology, assist with business development and share faculty expertise with the business community.

Finally, as noted in research question seven, an attempt was made to identify the motivating factors responsible for encouraging or discouraging increased institutional involvement in economic development activities among public institutions. An additional aim was to identify perceptions of the most persuasive or compelling factors in encouraging a greater level of involvement in economic development activities during the past ten years and which the respondents believed to be the most persuasive or compelling in discouraging a greater level of involvement. The respondents were asked to identify these factors in a more open-ended response format with or without reference to the list of 36 factors previously noted. The forced choice format limited the range of factors cited as significant in responding to research question seven. The responses to the open-ended format are listed as follows for public institutions. The factors described as encouraging closely parallel the individual factors rated as most encouraging as identified in question seven and in Table 31.

Respondent 1

Encouraging

A. Adoption and nurturing concept of interactive university—one that extends itself into the economic, societal, and cultural fibers of the community it serves, interacts with it, and becomes part of it. As part of community, the institution wants to provide better jobs for graduates than have been available.

B. Growth of technology- and knowledge-based industry in southwest Oklahoma.

C. Emphasis by OSRHE and the legislature on higher education's role in economic development

Discouraging

A. Paltry funding for initiatives

B. Oklahoma's culture of not believing in itself—thinking we have to settle for something less than quality economic opportunity

C. Continued PR success of votechs with little substance in making truly significant progress

Respondent 2

Encouraging

A. National trends in community college developments recognizing to inherent links in community and economic development

B. The visionary leadership of our President

C. The visionary leadership of the area's state congressmen

Discouraging

A. Funding sources

B. The business and industry communities' lack of interest in supporting public sector involvement

C. The faculty's lack of involvement

Respondent 3

Encouraging

A. An aggressive continuing education program

B. Business faculty's desire to "consult"

C. System-wide encouragement and Presidential leadership to engage in economic development

Discouraging

A. Economic development was viewed as a second or third level mission concern

B. Existing funding base barely enables the university to serve its historic student population at an adequate level

C. Failure to state-appropriated higher education monies to be targeted for economic development

Respondent 4

Encouraging

A. Greater facility occupancy/usage

B. Building up of campus

C. Greater exposure to public

Discouraging

A. Money

B. Time

C. Manpower

Respondent 5

Encouraging

A. Potential enrollment and revenue increases

B. Re-enrollment/continuing education, community development

C. Allows institution to stay current, possible corporate support benefits

Discouraging

A. To much institutional and state "red tape" to be as responsive and flexible as we could be

B. Lack of incentives (financial, etc.)

C. Limited resources (human, fiscal etc.) and time

Respondent 6

Encouraging

A. State government initiatives that have redefined the tax base and expanded the economy, yielding an increased funding base and greater support for Oklahoma higher education

B. The positive influence of the OSRHE policies that encourage economic development activities

Discouraging

A. Continuing socio-economic and psychology barriers between public higher education and the Oklahoma business communities

Respondent 7

Encouraging

A. Recognition by politicians, industrial leaders, and opinion makers that higher education indeed plays a significant role in the economic development activities in Oklahoma

Discouraging

A. The concept that economic development is the exclusive domain of vocational and technical education

Respondent 8

Encouraging

A. Legislative actions

B. University's mission

C. University's vision

Discouraging

A. Lack of seed money

B. Lack of resources for release time for faculty and staff

C. Apathy and difficulty in explaining importance to external leadership

Respondent 9

Encouraging

A. Commitment of Board

B. Commitment of President

C. Local Economy

Discouraging

A. Lack of funds

B. Communication with Business

C. Internal Awareness of faculty and staff

Respondent 10

Encouraging

A. General public awareness of the need to diversify Oklahoma's business and industrial tax base to lift us toward the national average income and to have more strategic partnerships to fund university-based economic development

B. The explosion of technology and new knowledge has changed the structure of the national economy. The success of many universities has encouraged all to use their intellectual properties to benefit their states' public policy.

C. The non-partisan statewide consensus among Governor and legislators has expressly manifested that state higher education research and technology transfer is essential to Oklahoma.

Discouraging

A. Possible failure of SQ 680 and 681

B. Current constitutional prohibition against corporate university collaboration

C. The level of state appropriations specifically designated for research

Respondent 11

Encouraging

A. Development of a strategic plan that clearly identified the mission of the institution and provided expected outcomes for economic development

B. Expectations of as well as significant support from employers

C. Public policy changes that recognize the need for a highly educated workforce in order to compete in a global economy

Discouraging

A. Legislature and State Regents do not fund economic development activities beyond those that generate credit hours.

B. Lack of a meaningful partnership between higher education and the vo-tech system.

C. Failure of OCAST and OAME to perform as expected. The money for these two

agencies would be much better utilized it if were allocated directly to institution of higher education.

Respondent 12

Encouraging

A. Introduction of distance learning, IETV, multimedia programming training and classes

B. Opening of federal funding sources to two-year colleges, i.e. NSF U.S. Department of Justice and National Industrial Associations

C. Statistical reporting of the need value and employee earning/reports of persons who continue their education (lifelong learners)

Discouraging

A. Institutional funding

B. Instructional teaching load at 2-year colleges

C. Oklahoma Vocational Technical System ability, i.e. TIPS program to provide no cost employee training

Respondent 13

Encouraging

A. Community interest

Discouraging

B. Lack of funding

Respondent 14

Encouraging

A. Encouragement from business and industry

B. Work with advisory committees

C. Work with state legislators

Discouraging

A. No state funding for specific activities

B. Danger of duplicating services of local Economic Development Council and organizations whose mission it is to provide such services

C. No funding for faculty to develop

Respondent 15

Encouraging

A. Need to encourage and strengthen entrepreneurship

B. Need to improve the per capita income of the people in this region (area of the state) to enhance their well being

C. We are uniquely situated to work with various entities in the region to enhance the economic development of the region.

Discouraging

A. Lack of funding from the state of Oklahoma to accomplish our primary purposes

B. Economic development has not been a high priority among our various priorities. Furthermore, there has been no incentive to pursue it.

C. Lack of expertise (until recently) in academic departments that are most likely to be involved in economic development.

Respondent 16

Encouraging

A. Establishment of economic development and business research centers

B. Publication of general business index to monitor and assess economic activity in the region

C. Development of Manufacturing Alliance Center

Discouraging

NONE

Respondent 17

Encouraging

A. Belief of president and business community that this was an important role for the college

B. Strong support by the college regents for these activities

C. For the metropolitan area to adjust from an oil economy base to a more diversified economy, the college was seen as an important vehicle to make this change.

Discouraging

A. There is a natural resistance to change on the part of some faculty and staff

B. State funding patterns have encouraged the status quo

C. Many state leaders have a lack of understanding and consequently support of community colleges in economic development

Respondent 18

Encouraging

A. The Universities core mission of education and training spurs economic development

B. The faculty's desire to generate new ideas and new knowledge can be honed through technology transfer into entrepreneurial enterprises or more simply, patents and copyrights.

C. Revenue generation. The college of continuing education engages in a great number of technical training and education programs in order to generate revenue to be self-sustaining.

Discouraging

A. Perceived conflicts of interest that previously have been complemented with restrictive policies that hinder technology transfer

B. Arguments offered by some who would say that a university should not engage in economic development for the sake of economic development, but rather, the university should remain pure and not recognize economic interest in the pursuit of knowledge.

C. State constitution prevents equity positions.

Respondent 19

Encouraging

A. Financial constraints have encouraged more aggressive actions to ferret out revenue-generating activities. Being forced to become more entrepreneurial.

B. Recent legislation to focus on allowing state supported institutions to own equity in their start-up companies and faculty to own equity in their inventions

C. Assist with recruiting and retaining "super star" researchers if the institution has an ongoing technology transfer operation with a proven track record of spin off companies

Discouraging

A. State laws which prohibit equity ownership and demand no conflict of interest

B. Traditional mind set of university attorneys to resist any entrepreneurial or slightly

progressive cutting edge activities proposed

Respondent 20

Encouraging

A. An increasingly competitive global economic environment has created greater pressure on higher education to provide more specific and direct services in support of the effort to make the state and nation more competitive and to remain competitive. The technology-based availability of data and information and its intelligent and innovative use worldwide is providing both a spur to this competition as well as a compelling reason for demanding that higher education play a more well defined role in assisting society's use of its (data and information) rapidly expanding availability.

B. The rising cost of higher education and a public belief in its importance to personal well being has provided major concern about continuing access to its benefits because of rising costs. The upshot has been to produce an unprecedented demand that higher education demonstrate the quality and relevance of its product (the accountability demand). In turn this has tied higher education more closely to the question of the relationship between its costs and its immediate post graduate value (defined in economic terms).

C. As a corollary, and as an additional cause for "B," higher education has been historically cavalier about the issue of systems (instructional and curriculum) design as well as obstinate in tying design to a process of evaluating systems effectiveness. So long as individual institutions retained a monopoly on the delivery of education services in their respective service regions these traditional attitudes continued to

prevail. For all practical purposes electronically based distance education alternatives have destroyed this monopoly to include the argument that credentialling should be a function of the job and career marketplace, not the purview of the historic academy (argued now to be out of touch with the "real" needs of society and economy).

Discouraging

A. Geographic isolation of colleges and universities and high degree of historic, self-centered institutional autonomy in matters relating to academic programs and curricular offerings

B. Lack of adequate available data and information resources that would allow individual institutions to make significant contributions in the realm of economic development. Technology and distance education will have a profound impact in altering this condition.

C. Public misconceptions and misunderstandings concerning the distinction between education and training. Confusing the two has resulted in the expectation that the former should have the same payoff as the latter when in fact it doesn't. The public's confusion nonetheless promotes unfair and debilitating criticism of education when its payoff is not similar to that of training. Public criticism in turn has generated significant defensiveness and unresponsiveness on the part of the academy as well as a significant and debilitating suspicion of public demands that higher education be more responsive to economic development needs.

Summary

Many responses exemplify the reality of the disconnect that higher education drives economic growth and prosperity, yet investment and wealth are necessary to maintain an acceptable level of funding for higher education. A final theme expressed indicates a desire for colleges and universities, vocational technical schools and companies to stop short of taking each others' forms and functions and seek instead to do what each can do best and cooperate with the other to complement respective purposes and natural functions.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter provides a summary of the study, its findings, conclusions, and recommendations for application and further research.

The purpose of this study was to gather and present empirical data to better understand and to inform decision makers and researchers about the level and nature of involvement in economic development activity among academic institutions in Oklahoma, both public and private, and to describe factors influencing this involvement. The study sought to a) identify the economic development activities of institutions over the past decade, b) determine which external factors had influenced the decisions to participate in the activities, c) determine if institutions had strategically planned for any involvement for the future and what external factors might have played a role in such decisions, d) examine how has economic development activities changed over time, e) identify what type of businesses are being served f) identify what a factors motivate or encourage institutions to become involved in economic development activities and finally g) learn from institutional leaders what they perceive the role of higher education and economic development to be and what their institutional plans for the future include.

The research questions were:

1. To what extent did institutions participate in selected economic development activities from 1988–1998?

2. Which external factor(s) influenced decisions to engage in selected economic development activities from 1988–1998?
3. To what extent have institutions strategically planned for selected economic development activities for 1998 and beyond?
4. Which external factors influenced institutional decisions to develop strategic plans for selected economic development activities?
5. What economic development activities have higher education institutions in Oklahoma been engaged in the past, present and plan to be in the future? How are specific activities associated with the type of institution?
6. What types of businesses are being served by the economic development activities of institutions of higher education in Oklahoma?
7. What are reported to be the "motivating" factors responsible for encouraging (or discouraging) increased institutional involvement in economic development activity among public institutions?
8. What, if any, change has occurred among selected academic policies associated with increasing institutional involvement in economic development activity?
9. In the opinion of the respondents, what is the role of higher education, if any, in economic development? What factors encourage or discourage involvement in economic development activities? What are the respondents anticipated economic development activities for the future?

To address these research questions, the Economic Development and Policy Change Survey was developed. The survey consisted of closed-ended questions with a Likert-type scale to measure responses related to economic development activities, level of

activity, planning, external factor influences, extent of changes in academic policies, and degree of influence for motivating factors. Open-ended questions were asked to assess the respondent's perception of the role of higher education institutions in economic development, encouraging or discouraging factors and likely activities for the future.

The entire population of presidents (n = 44) representing all public and private institutions in Oklahoma were targeted for the study. Twenty-five institutions of higher education responded to the survey instrument for a response rate of 57%. Of the public institutions, 21 institutions responded for a response rate of 72%. Four of the private institutions responded for a response rate of 26%. All of the responses were useable.

Summary of the Findings

The first research question related the extent institutions participated in selected economic development activities over a ten-year period. The data were separated for public and private institutions as well as by type of public institution for comparison purposes. Education, Training and Management and Workforce Development were the economic development activities that public institutions, as a whole, most participated in over the past decade followed by Networking and Partnerships, Business Development, General Technical Assistance and Data Collection and Dissemination. Activities least engaged in by public institutions, as a whole, were Technology Transfer, Rural Development, Applied Research, Research and Development, Funding Procurement, Copyrights, Patents and Trademarks, International Trade and Research Parks/Incubators.

The second research question explored external factors that influenced public and private institutional decisions to engage in economic development activities over a ten-year period. Private institutions reported not being influenced by political or economic

factors and only slightly influenced by technological or social/cultural factors. Public institutions reported economic factors strongly influenced new business development, education, training and management and workforce development as well as networking and partnerships. Political factors were the strongest among public institutions regarding education, training and management and workforce development. Technological factors influenced participation in technology transfer activities and education training and management, and workforce development. Social/Cultural factors were reported by public institutions to influence their decisions to participate in business development and education, training and management, and workforce development.

Research question three examined public and private institutions strategic planning efforts for economic development activities for the future. Public institutions planning efforts for the future are greatest in the areas of business development; data collection and dissemination; education, training and management, workforce development; and networking and partnerships. Private institutions planning efforts for the future are the greatest in the areas of data collection and dissemination; education, training and management, workforce development; funding procurement; general technical assistance; and technology transfer.

Research question four explored external factors influencing institutional decisions to development strategic plans. External influences on strategic planning among public institutions are greatest in the activities of business development; education, training and management, workforce development; and networking and partnerships. There appears to be minimal influence of external influences on the strategic planning efforts of private institutions. Economic and Technological factors have a greater influence than political

or social/cultural factors on the development of innovative and entrepreneurial activities among public institutions. Again, little to no influence is reported by the private institutions, especially political factors.

Research question five examined changes regarding participation in economic development activities over time. Among public institutions, all identified types of economic development activities are reported to be increasing. The greatest increases in type of activity for all public institutions are seen in the areas of technology transfer and new business development.

Research question six identified the types of businesses being served in Oklahoma by institutions of higher education. Manufacturing, wholesale/retail and government/ education were the recipients of most of the public institutions' activities. Government/ education was the largest type entity served by private institutions. These institutions are serving hundreds of employers, impacting thousands of employees and generating millions of dollars.

Over 90% of public institutions (n = 21)reported economic development activities to be increasing. Research question seven identified the "motivating" factors that influenced increased institutional involvement among public institutions. Factors such as point of view of the president, of business leaders, of state/legislators/government, having a strategic plan, wanting to improve public relations and image, transmitting knowledge through nontraditional teaching, increasing state appropriations, meeting public service obligations, generating new knowledge, and increasing corporate involvement appear to be the most influential. Factors related to recruitment of students, increasing faculty

publishing, augmenting faculty salaries were seen to have little influence on decisions related to the level of the institution's involvement in economic development.

Research question eight sought to identify changes in internal academic policies with increases in institutional involvement in economic development activities. While all public institutions are increasing their economic development activities, no significant relationship was found between the level of economic development activity and the involvement or changes among selected academic policies. In addition, there appears to be no relationship between the level of economic development activity and the type of institution, with the exception of the comprehensive universities, which do have a greater level of activity.

The ninth research question asked the respondents what they believed to be their institution's most important economic development activities for the future. Human Resource Development ranked overwhelmingly the highest. Capacity Building ranked second, followed by Technical Assistance, Research and Technology Transfer. Least identified activities for the future were New Business Development and Economic Research and Analysis. The research question also explored the respondent's perception of the role of higher education in economic development. All of the public institutions reported having a role in economic development. A large majority of the respondents stated the major role was to provide employers with an educated workforce, fulfill the mission of the institution, provide leadership, build community partnerships, conduct research and share technology, assist with business development and share faculty expertise with the business community. Finally, the research question identified the perceptions of the most persuasive or compelling factors in both encouraging and

discouraging a greater level of involvement in economic development activities during the past ten years. The factors described as encouraging closely parallel the individual factors rated as most encouraging as identified in question seven. Discouraging factors include lack of funding and resources, along with competition with the vocational technical schools.

Conclusions

Based on the findings of this study and comparisons with research cited in chapter two, the following conclusions are drawn:

1. This study of Oklahoma institutions of higher education suggests that public institutions (n = 21) are increasingly involved in economic development activities. As reported, over 90% noted increasing institutional activity in economic development over the preceding ten years. These findings suggest that institutions will decide upon the nature and level of their involvement in economic development activities in the context of a complex array of external and motivating factors. Additional study in this area, in particular with regard to the purported linkage between increased economic development involvement and expanded funding, would be of assistance to leaders contemplating more extensive commitment of their institutions' resources to economic development initiatives. A better understanding of the negative costs of enhanced activity in economic development is needed as well as purported benefits from proposed changes in internal academic policies and procedures. Results of this study should be considered as preliminary and used as a guide for future in-depth studies of selected institutions and economic development activities.

2. The variety of ways Oklahoma public colleges and universities are participating in economic development, the different roles they are developing, differing internal policies that have been changed, and the varying successes they have achieved, makes it clear that effective involvement in economic development does not happen in any organized or systematic fashion within the Oklahoma state system of higher education. Equally important, is the fact there appears to be no relationship between the level of economic development activity and the type of public institution, with the possible exception of the comprehensive universities. This is contrary to much of the literature, which suggests different types of institutions participate in different types of activities. (AASCU, 1986; Cote, 1993). Colleges and universities in Oklahoma have been seeking on their own to determine if their institutions have areas of specialization that can contribute to economic development and explore potential industry-university relationships to secure resources for the implementation of these activities. The literature suggests various prerequisites for an institution's successful role in economic development in terms of knowing each institutions supportive factors and major barriers (AASCU, 1986). Findings of this study provide an initial level of information regarding identification of institutions current activities, supportive and motivating factors, external influences and perceived barriers to making institutional involvement more effective.

3. Colleges and universities in Oklahoma are operating within their own economic environments. A similar study of economic development activities of higher education institutions in the Commonwealth of Virginia (Wigginton,1996) parallels the economic development activities and external influences of public institutions in

Oklahoma found in this study. A similar study of colleges and universities in other states where higher education institution's involvement in economic development is widely recognized could be of benefit. In addition, a follow-up study could determine if there are regional economic development environment differences that better explain the institutional economic development activities of selected institutions or whether other factors are present. Such a study could better provide insight into the types of activities colleges and universities choose to be engaged in.

4. This study identified the "motivating" factors responsible for encouraging increased institutional involvement in economic development activities among public institutions. The results closely mirror similar national studies of four year institutions (AASCU, 1986) and land grant institutions (Cote, 1993). While institutional involvement in economic development activities is increasing in Oklahoma , albeit in a variety of ways, the factors motivating this activity are not seen as different in Oklahoma than in the rest of the country.

5. The literature suggests a strong correlation between level of economic development activity and change among selected academic policies (Cote, 1993; AASCU 1986). The findings of this study found no significant relationship. Institutions in Oklahoma may not be associating increases in economic development activity with initiating changes in related faculty or other internal policies but are, instead, dealing with individual issues in isolated ways. State Questions 680 and 681 on the November ballot may signify a change in this pattern of institutional behavior.

6. According to this study, the single most important key to successful institutional involvement in economic development is leadership. Entrepreneurial leadership by

the institutional president is particularly important closely followed by the leadership of the business community and state government. The causes for such intensified leadership may be varied. This study identified external economic and technological factors as having the greatest influence on innovative and entrepreneurial activities of public institutions. Given this finding, it is increasingly important for higher education institutions to build better relationships, working partnerships and improved communication with each other, business and industry leaders, and state government.

Recommendations

Additional research and activities are needed to better understand the interactions between higher education activities and the impact on the economy in Oklahoma. The following suggestions are made as a result of the conclusions drawn from this study:

1. The goals of public higher education institutional involvement in economic development activities must be clearly defined in terms of statewide economic goals, regional economic goals and institutional goals by the leadership of institutions in higher education, the business community, and state government. A determination must be made to align the current economic development activities of institutions and the economic objectives and needs of the state and various regions, avoiding, as much as possible, distributive politics and policies.
2. An examination of institutional internal policies and procedures should be made to identify barriers in meeting stated institutional, regional and state economic development goals. Identification of the negative as well as positive costs associated with changes in internal policies and procedures should be identified.

3. The relationship between the presence of a degree-granting institution of higher education and the level of per capita personal income by county should be quantified by type of institution, public or private; level of institution, two-year, four-year, or comprehensive; and location of institution, urban or rural.

4. The economic return of economic development activities engaged in by higher education institutions should be quantified by type of economic development activity.

5. Institutional resources committed to engage in each economic development activity should be identified by type of investment—instruction, research or public service. Economic rate of return, positive and negative, should be measured and quantified for each type.

6. Recognizing the need for the development of uniform data collection and reporting techniques, a task force composed of representatives from the Oklahoma State Regents for Higher Education, the Oklahoma Tax Commission, the Oklahoma Center for the Advancement of Science and Technology and the Oklahoma Department of Commerce should be established.

REFERENCES

1. Adelman, Clifford. (1988, Spring). To compete or not to compete: What higher education can do while everyone else sorts it out. Educational Record, 69 (2), 32–37.

2. Alfred, R.L (1980). Socioeconomic impact of two-year colleges. Los Angeles: ERIC Clearinghouse for Junior College Information. (ERIC Document Reproduction Service No. ED 181 983)

3. Alfred, R.L., & Weissman, J. (1988). Public image and the university. Washington, DC: ERIC Clearinghouse on Higher Education. (ERIC Document Reproduction Service No. ED 301 145)

4. American Association of State Colleges and Universities. (1986). The Higher Education -Economic Development Connection. Emerging Roles for Public Colleges and Universities in a Changing Economy. Washington, DC: Author.

5. American Association of State Colleges and Universities. (1988). Allies for Enterprise. Highlights of the 1987-88 National Conference on Higher Education and Economic Development.

6. American Association of State Colleges and Universities. (1989). Directory of Economic Development Programs at State Colleges and Universities.

7. American Council on Education, Washington, DC, Division of Policy Analysis and Research. (1968). What is the Service Sector/ Enterpreneurship and Higher Education Lessons for Colleges, Universities, and Industry: ASHE-ERIC Highere Education Report, No.: Washington, DC: Association of the Study of Higher Education, 1988.

8. Anders, Gary C. (1992, Winter). The Changing Role of the Public University in Local Economic Development. Economic Development Review, 8(1).

9. Ashworth, K.H. (1994). Performance-based funding in higher education: The Texas case study. Change, 26.

10. Baer, W. S. (1980). Strengthening University-Industry Interactions. Santa Monica, CA. Rand Corporation.

11. Baldwin, Donald R. (1988, Fall). Academia's New Role in Technology Transfer and Economic Development. Research Management Review, 2 (2).

12. Beachler, J. A. (1985). Higher Education and Economic Development: A Relationship. Inquiry No. 030-85-034). Harrisburg, PA: Pennsylvania Legislative Office for Research Liaison. (ERIC Document Reproduction Service No. ED 255 152).

13. Bernstein, M.H. (1986). Higher Education and the State: New Linkages for Economic Development. Washington, DC: National Institute for Work and Learning.

14. Beyers, W., Johnsen, E., & Stranahan, H. (1987, Winter). Education and Economic Development. Economic Development Commentary, 14–17.

15. Blanton, William. (1987) Technology Transfer: Three Ways to Make It Happen. Appalacia. 20(2).

16. Bloch, W. (1986) Basic Research: The Key to Economic Competitiveness. Washington, DC, U. S. National Science Foundation. (ERIC Document Reproduction Service No. ED 271–316).

17. Bluestone, Barry. (1987, Fall). Reviving America's Standard of Living: The Role of the State. Economic Development Commentary.

18. Bluestone, Barry. "States May Be Making a Healthy Profit on Their Public Colleges and Universities." Chronicle of Higher Education. October 6, 1993, A52.

19. Blumenstyk, Goldie. (1989, December 13). States Use Cut-rate Tuition as an Economic Development Tool. Chronicle of Higher Education.

20. Bok, Derek. Beyond the Ivory Tower, Social Responsibility of the Modern University. Boston: Harvard University Press, 1982.

21. Bovee, Courtland L., Thill, John V., Wood, Marian Burk, and Doval, George P. (1993). Management, McGraw-Hill, Inc., New York.

22. Bowen, Howard R. Investment in Learning. Jossey-Bass. 1977.

23. Bowen, Howard R. The Costs of Higher Education. Jossey-Bass, 1980.

24. Boyer, Ernest L. (1992). Scholarship Reconsidered: Priorities of the Professoriate, The Carnegie Foundation for the Advancement of Teaching, California/Princeton Fulfillment Services, Ewing, NJ.

25. Boyle, M. Ross. (1989, Spring). Research and Development Facilities—a Specialized Market for Economic Developers. Economic Development Review, 7.

26. Brand, Myles (1993). The Challenge to Change: Reforming Higher Education, Educational Record, Fall, 7–13.

27. Breslin, J. (1986). State Initiatives to Promote Technological Innovation and Economic Growth: Postsecondary Research Report. Annapolis, MD: Maryland Board for Higher Education. . (ERIC Document Reproduction Service No. ED 270 047).

28. Brody, Herb. (1985, January). States Vie for a Slice of the Pie. High Technology.

29. Caffrey, John and Herbert H. Isaacs. Estimating the Impact of a College or University on the Local Economy. Washington, DC: American Council on Education, 1971.

30. Cantlon, J. (1985, May). The Role of a Land-grant University in Economic Development. [Paper presented at Symposium on Business/Academic Partnership in the Economic Development of Maui. University of Hawaii, Honolulu. Maui Economic Development Board. (ERIC Document Reproduction Service No. ED 269 997).

31. Chandler, John W. (1990). Higher Education In the 1990s, Liberal Education, Vol. 76, No. 2, March/April, 14–17.

32. Childs, Sally A. (1989). The Role of Lake Superior State University in Promoting Development in the Eastern Upper Peninsula: A survey of Attitudes and Ideas of Key Officials and Business People. Lake Superior State University, Center for Social Research.

33. Chmura, T. (1987, Fall). The Higher Education-Economic Development Connection. Economic Development Commentary.

34. Clark, M. (1986). Revitalizing State Economies: A review of State Economic Development Policies and Programs. Washington, DC; National Governors' Association.

35. Clark, M., & Dobson, E. (1989). Promoting technological excellence: The role of state and federal extensions activities. Washington, DC: National Governors' Association.

36. Clark, M.J. (1993). The economic impact of San Juan College on San Juan County New Mexico. Farmington, NM: San Juan College; Office of Research, Grant Development, and Planning. (ERIC Document Reproduction Service No. ED 354 035)

37. Cisneros, Henry G. (1995). The University and the Urban Challenge. (Rev. Ed.). Housing and Urban Development.

38. Citizens' Commission on the Future of Oklahoma Higher Education, October, 1997. Oklahoma State Regents for Higher Education.

39. Clark, E. J. (1992, August). The Role of Colleges and Universities in the Stimulation of Regional Research and Service. [Paper presented at the 17th annual conference of the Society for College and University Planning, Buffalo, NY.]. (ERIC Document Reproduction Service No. ED 235-731).

40. Clarke, M. (1985) Revitalizing State Economies: A Review of State Economic Development Policies and Programs. Washington, DC: National Governors' Association.

41. Colorado Commission on Higher Education. (1992, September). Master Plan Background Paper. As a State, What Level of Participation in Postsecondary Education is Necessary to Assure a Just and Economically Successful Society? Denver, CO.

42. Cote, Lawrence S., & Mary. (1993, Jan.-Feb.). Economic Development Activity Among Land-grant Institutions. Journal of Higher Education. 64.

43. Crosson, P. (1986). Encouraging Faculty Involvement in University Economic Development Programs. Issues in Higher Education and Economic Development. Washington, DC.: AASCU.

44. Dibiasio, D.A. (1986, February). Higher Education under study: A comparative analysis of six statewide reports. Paper presented at the annual meeting of the Association for the Study of Higher Education, San Antonio, TX (ERIC Document Reproduction Service No. ED 268 894).

45. Dukakis, Michael S. (1984, Spring). The Massachusetts Idea. National Forum: Phi Kappa Phi Journal. 64.

46. Education Commission of the States. (1998). Transforming postsecondary education for the 21st century: Views of the Governors. Washington, DC: Author.

47. Engleking, Susan. (1992, Winter). Brains and Jobs: The Role of Universities in Economic Development Industrial Recruitment. Economic Development Review, 10.

48. Fairweather, James S. (1990). The University's Role in Economic Development: Lessons for Academic Leaders. Journal of the Society of Research Administrators, 22.

49. Fairweather, James S. (1989, July-August). New Uses for the University. Educational Record, 70.

50. Fairweather, James S. (1989). Academic Research and Instruction. Journal of Higher Education, Vol 60, No.4.

51. Flynn, P.M. (1986). Technological change, the "training cycle," and economic development. Technology, regions, and policy. pp. 282-308. Totowa, NJ: Rowan & Littlefield.

52. Fitzpatrick, J.A., Burkhalter, B.B., Hethcox, J.H. & Wilmouth, J.N. Validation of the Higher Education Economic Development Survey. Evaluation Review.

53. Forster, Bruce, A. (1989, Fall). Unskilled Labor Migration and Capital Mobility: A Diagrammatic Exposition. Journal of Economic Education, 20.

54. General Accounting Office. (1983). The Federal Role in Bolstering University-Industry Cooperation. Washington, DC. (ERIC Document Reproduction Service No. ED 247-746).

55. Glenny, L.A. (1985). State coordination of higher education: The modern concept. Denver, CO: State Higher Education Executive Officers Association. (ERIC Document Reproduction Service No. ED 270 070).

56. Goldstein, Harvey, A. (1989-90). Estimating the Regional Economic Impact of Universities: An Application of Input-Output Analysis. Planning for Higher Education, 18:1. Community, Technical, and Junior College Journal 61.

57. Gonzalez, Tom. (1991, Feb.–Mar.). The Sensible Choice: High Skills and Community Colleges.

58. Grant Thornton, (1987). 8th Annual General Manufacturing Climate Study. Chicago: Author.

59. Hansen, M. (1988). Economic Development and Regional Herogeneity: A Reconsideration of Regional Policy for the United States. Economic Development Quarterly, 2(2).

60. Hansen, N. (1988). Economic and regional heterogeneity: A reconsideration of regional policy for the United States. Economic Development Quarterly.

61. Harris, Edward. (1983). A Plan for Economic Development in the State of Illinois--An Educator's Perspective.

62. Harris, Edward. (1984). Management Model for Economic Development. Springfield, IL: Illinois Development Council.

63. Heathcox, J. Henley. (1990). Validation of Higher Education Economic Development Survey Instrument with State University and Land-grant Institutions Research Administrators. [unpublished doctoral diss.]

64. Higgerson, Mary Lou. (1988, Spring). Higher Education in Transition: A Special Challenge for Continuing Education. Continuing Higher Education Review, 52 (2).

65. Horton, Nancy and Andersen, Charles (1994). Linking the Economy to the Academy: Parallel Trends, Research Briefs, Vol. 5, No. 4, 1994. A division of Policy Analysis and Research, American Council on Education.

66. Hoy, J. & Bernstein, M. (1982). Financing higher education. Boston: Auburn House.

67. Hudson, Barclay M. "Regional Economic Effects of Higher Education Institutions." Chap. in Socio-Economic Planning Science. United Kingdom: Pergamon Press, Vol 8. 1974.

68. Hughers, K.S., Alston, F.K., & Bayne, K. (June, 1988) Beyond Education: The economic importance of institutions in their community. KPMG Peat Marwick Management Issues. 1–5.

69. Inter-University Council of Ohio. "An Economic Impact Statement, Ohio's Education Portfolio." Columbus: 1992.

70. Jaschik, Scott. (1987, November). University Business Ventures Often Dominated by Professors and Officials Who Pursue Their Own Interests, Report Charges. Chronicle of Higher Education, 34.

71. Jeacock, Robert L. (1983). The Impact of Malapina College on the Local Economy.

72. John, D. (1987). Shifting Responsibilities: Federalism in Economic Development. Washington, DC: National Governor's Association.

73. Johnson, L. G. (1984). The High-technology Connection: Academic Industrial Cooperation for Economic Growth. (ASRHE Report No. 6). (ERIC Document Reproduction Service No. ED 255–130).

74. Jones, B., & Vedlitz, A. (1968). Higher Education Policies and Economic Growth in the American States. Economic Development Quarterly, 2(11).

75. Killian, Molly, & Parker, Timothy. (1991). Higher Education No Panacea for Weak Rural Economies. Rural Development Perspectives, 16.

76. Kerr, Clark (1994). Troubled Times for American Higher Education: The 1990s and Beyond, State University of New York Press, Albany.

77. Kerr, Clark (1982). The Uses of the UniversityHarvard University Press, Cambridge, Massachusetts, London, England.

78. Kott, Joseph. (1988). Regional Economic Impact of Institutions of Higher Education. Planning for Higher Education, 16(14).

79. Larson, Thomas D. (1989, Summer - Fall). New Uses for the University. Educational Record, 70(3-4).

80. Layzell, Daniel T. and Lyddon,Jan W. (1990). Budgeting for Higher Education at the State Level: Enigma, Paradox, and Ritual, ASHE-ERIC Higher Education Report No. 4 Washington, DC: The George Washington University, School of Education and Human Development.

81. Leslie, Larry. (1986). Regional Economic Impact of Institutions of Higher Education. Planning for Higher Education, 16(4).

82. Leslie, Larry L., and Paul Brinkman. The Economic Value of Higher Education. New York: American Council of Education, Macmillan, 1988.

83. Leslie, L.L., & Brinkman, P.T. (1993). The economic value of higher education. Phoenix, AZ: Orynx.

84. Leslie, Larry L. and Sheila A. Slaughter. "Higher Education and Regional Development." In Higher Education and Regional Growth. Boston: Kluwer Academic Publishers, 1992.

85. Linnell, R. H. (1982). Dollars and Scholars. Los Angeles, CA.: University of Southern California Press.

86. Logan, L. (1984). AASCUA Institutional and Industry: Partners in Progress. Washington, DC, U. S. American Association of State Colleges and Universities. (ERIC Document Reproduction Service No. ED 256-261).

87. Lynton, Earnest A. (1982, November–December). The Economic Impact of Higher Education. Journal of Higher Education, 54(6).

88. Lynton, E. A., & Elman, S. E. (1987). New Priorities for the University. San Francisco, CA: Jossey-Bass.

89. McComas, James D. (1992). Students: At the Center, A Higher Education Map for the 1990s, edited by Gene A. Budig, American Council on Education and Macmillan Publishing Company, New York.

90. McMillan, Lin, & Mangan, Katherine S. (1989, March 22). Profits and Perils in Real Estate. Chronicle of Higher Education, 35(4).

91. Malecki, E. J (1987, October). Hype or Hyperbole: High Tech and Economic Development. Technology Review.

92. Maidique, Modesto A. (1988, Fall). Universities: A Focal Point for Economic Development. National Forum: Phi Kappa Phi Journal, 68(4).

93. Mansfield, Edwin. (1982). Education, R and D Productivity Growth.

94. Matthews, J., & Norgaard, R. (1984). Managing the partnership between higher education and industry. National Center for Higher Education Management Systems.

95. Melchiori, G.S. (1984). Research on university-industry linkages: The state of the art. Paper presented at the 24th annual forum of the Association for Institutional Research. Forth Worth, TX.

96. Miller, H.G. & Clark, E.J. (1983). Planning and managing technology programs; A challenge to higher education. Paper presented at the 18th annual meeting of the Society for College and University Planning, New Orleans, LA.

97. National Association of State Universities and Land-Grant Colleges. (1997). Value Added; The Economic Impact of Public Universities. Washington, DC: Author.

98. National Science Foundation. (1982). University-industry research relationships; Myths, realities, and potentials. Washington, DC: Author.

99. Northeast-Midwest Institute. (1988) Education Incorporated: School-Business Cooperation for Economic Growth. Westport, CT. Quorum Books.

100. Osborne, D. (1987). Economic Competitiveness: The States Take the Lead. Washington, DC. Economic Policy Institute.

101. Ostar, Allan W. (1991). Partnerships Between the Interactive University and Its Constituencies, Economic Development Review, Winter, 56–57.

102. Pearce II, John A. and Robinson, Jr., Richard B. (1989). Management, Random House, New York, N.Y.

103. Pearson John. (1989). Technical and Management Assistance Through Research Universities. The Michigan Example. Economic Development Review, 7(2).

104. Peters, L. S., & Fusfeld, H. I.. (1993). Current U.S. University/Industry Research Connections. University-Industry Research Relationships: Selected Studies, National Science Foundation.

105. Rolzinski, C. (1986). The Power of the People in Community Economic Development. Washington, D C, U. S.: AASCU.

106. Rose, David C. (1993, April). The Economics of American Higher Education. Southern Economic Journal 59(4).

107. Rosen, Mark I. (1985). The University of Wisconsin-Madison and the Local and State Economies: A Second Look.

108. Rosenberg, Ronald. (1985, January). What Companies Look For. High Technology .

109. Schmadt, J., & Wilson, R. (1988). State science and technology policies: An assessment. Economic Development Quarterly.

110. Schultz, Theodore William. Investment in Human Capital: The Role of Education and of Research. New York: Free Press, 1970.

111. Sheppard, R. J. (1986, September). Research and Development and the Role of the Urban University in Stsrategic Economic Development Planning. [paper presented at the International Urban Universities Conference, Winnepeg, Maintoba, Canada. (ERIC Documentation Reproduction Service No. ED 277–799).

112. Slaughter, S. (1990). The Higher Learning and High Technology: Dynamics of Higher Education Policy Formulation. Albany, N.Y.: State University of New York Press.

113. Southern Regional Education Board. (1994). Changing States: Higher Education and the Public Good. Atlanta, GA: Author.

114. SRI International. (1986). Public Policy Center. The Higher Education-Economic Development Connection: Emerging Roles for Public Colleges and Universities in a Changing Economy. Washington, DC: U. S. American Association of State Colleges and Universities.

115. Smith, T., (1987). Drabenstott & Gibson. The Role of Universities in Economic Development. Economic Review.

116. Stankiewicz, R. (1986) Academics and Entrepreneurs: Developing University-Industry Relations. New York, N. Y.: St. Martin's Press, Inc.

117. The Maryland State Board for Higher Education. (1996). State Initiatives to Promote Innovation and Economic Growth. Author.

118. State Regents Award $3.2 Million in Economic Development Grants. (1998, July 9). The Oklahoma State Regents for Higher Education News Release.

119. Steward, Thomas J. (1989, Spring). The Economic Impact of a Historically Black College upon Its Local Community. Journal of Negro Education, 58(2).

120. Stokes, Kevin. (1996). The Local Impact of Higher Education. Paper presented at the Annual Forum of the Association for Institutional Research, Albuquerque, New Mexico, May 5-8, 1996.

121. Susman, N. Bradley. (1990, Winter). The Role of the Technical University in Area Economic Development: A Review and Appraisal. Economic Development Review.

122. Thornbrugh, D. (1988, August). The State's Role in an Era of Economic Transition: The Pennsylvania Experience. Economic Development Quarterly, 2(2).

123. Tornatyzky, L.G. (1983). Research or innovation; Stretching the limits of the discipline. Paper presented at the 91st annual convention of the American Psychological Association, Anaheim, CA.

124. Tulsa World. (1998, May, 19). p. B10.

125. Udell, Gerald G. (1990, March-April). Academe and the Goose that Lays Its Golden Egg. Business Horizons, 33(2).

126. Veblen, Thorstein. The Higher Learning In America. New York: Hill and Wang, 1957.

127. Watkins, C. B. (1958a). Programs for Innovative Technology Research in State Strategies for Economic Development. Washington, DC: National Governors' Association, Center for Policy Research.

128. Watkins, C. B. (1958b). Programs for Innovative Technology Research in State Strategies for Economic Development. Washington, DC: National Governors' Association, Center for Policy Research.

129. Watson, Joseph A., & McGinn, M. J. (1987, November). Higher Education in Support of Regional Economic and Industrial Development. International Journal of Institutional Management in Higher Education, 11(3).

130. Wigginton, Karen W. (1996): The Role of Higher Education in Economic Development: An Assessment of the Economic Development Activities of Higher Education Institutions in the Commonwealth of Virginia. (Doctoral Dissertation, University of Virginia, 1996).

131. Wolff, Robert Paul. The Ideal of the University. Boston: Beacon Press, 1969.

132. Wood, William C., & Winter, Paul A. (1988, Fall). Getting from Here to There: Helpful Technical Assistance from a University. Economic Development Review, 6(3).

APPENDIXES

APPENDIX A

List of the Population

Oklahoma Institutions of Higher Education

Comprehensive Institutions

Oklahoma State University
107 Whitehurst Hall
Stillwater, OK 74078

The University of Oklahoma
600 Parrington Oval
Norman, OK 73019

The University of Oklahoma
Health Science Center
P. O. Box 26901
Oklahoma City, OK 73126

Oklahoma State University College of Osteopathic Medicine
1111 West 17th Street
Tulsa, Ok 74107

Regional or Senior State Universities

East Central University
1100 Each 14th Street
Ada, OK 74820

Northeastern State University
600 North Grand Avenue
Tahlequah, OK 74464

Northwestern Oklahoma State University
709 Oklahoma Boulevard
Alva, OK 73171

Southeastern Oklahoma State University
Station A
Durant, OK 74701

Southwestern Oklahoma State University
100 Campus Drive
Weatherford, OK 73096

University of Central Oklahoma
100 North University Drive
Edmond, OK 73034

Cameron University
200 SW C Avenue
Lawton, OK 73505

Langston University
P. O. Box 907
Langston, OK 73050

Oklahoma Panhandle State University
Box 430
Goodwell, OK 73939

University of Science and Arts of Oklahoma
P. O. Box 82345
Chickasha, OK 73018

State Junior Colleges

Carl Albert State College
1507 South McKenna
Poteau, OK 74933

Conners State College
Warner, OK 74469

Eastern Oklahoma State College
1301 West Main
Wilburton, OK 74578

Murray State College
1100 South Murray Street
Tishomingo, OK 73460

Northeastern Oklahoma A&M College
200 I Street NE
Miami, OK 74354

Northern Oklahoma College
1220 East Grand
Tonkawa, OK 74653

Oklahoma City Community College
7777 South May Ave.
Oklahoma City, OK 73159

Redlands Community College
P. O. Box 370
El Reno, OK 73036

Rose State College
6420 SE 15th Street
Midwest City, OK 73110

Seminole State College
P. O. Box 351
Seminole, OK 74868

Tulsa Community College
6111 East Skelly Drive #200
Tulsa, OK 74135

Western Oklahoma State College
2891 North Main
Altus, OK 73521

Rogers University
Claremore Campus
1720 W. Will Rogers Blvd.
Claremore, OK 74017

Oklahoma State University Oklahoma City Technical Branch
900 North Portland
Oklahoma City, OK 73107

Oklahoma State University Okmulgee Technical Branch
1801 East 4th Street
Okmulgee, OK 74447

Private Universities and Colleges

Bartlesville Wesleyan College
2201 Silver Lake Road
Bartlesville, OK 74006

Mid-America Bible College
3500 SW 119th Street
Oklahoma City, OK 73170

Oklahoma Baptist University
500 West University Drive
Shawnee, OK 74801

Oklahoma Christian University of Science and Arts
P. O. Box 11000
Oklahoma City, OK 73136

Oklahoma City University
2501 North Blackwelder
Oklahoma City, OK 73106

Oral Roberts University
7777 South Lewis Avenue
Tulsa, OK 74171

Phillips University
100 South University Avenue
University Station
Enid, OK 73701

Southern Nazarene University
6729 NW 39th Expressway
Bethany, OK 73008

Southwestern College of Christian Ministries
P. O. Box 340
Bethany, OK 73009

The University of Tulsa
600 S. College
Tulsa, OK 74104

Private Junior Colleges

Bacone College
2299 Bacone Road
Muskogee, OK 74403

Hillsdale Free Will Baptist College
P. O. Box 72153
Moore, OK 73153

St. Gregory's College
1900 W. MacArthur Drive
Shawnee, OK 74801

Proprietary Institutions

National Education Center
Spartan School of Aeronautics Campus
P. O. Box 582833
Tulsa, OK 74158

APPENDIX B

ECONOMIC DEVELOPMENT AND POLICY CHANGE

A Survey of Oklahoma Institutions of Higher Education

Economic Development and Policy Change

This survey is being conducted as part of a study to better understand how and why institutions of higher education are becoming involved in economic development.

This survey requests you to indicate: 1) the extent to which your institution has been involved in economic development activities, and your plans for involvement in the future; 2) the effect that external and internal factors have on the decisions about whether to engage in such activities; 3) whether your institution has developed strategic plans related to economic development programming; and 4) what impact this involvement is having on changes in institutional internal policies.

Instructions:

Please respond to each question. In some instances more than one response can be given to a question. If you wish to comment on any questions or qualify your answers, please use the space in the margins or attach a separate sheet of paper. Your comments will be read and taken into account. Thank you in advance for your participation in this survey.

Please use the following definitions of the external forces when responding to the survey.

Social/Cultural forces-"The values, attitudes, needs and demographic characteristics of the societies in which the organization operates." (Bovee, Thill, Wood, and Bovel, 1993, p. 77) For example, social classes, geographical locations, etc.

Economic forces-the "...availability or scarcity of resources and the general economic trends that affect the organization." (Bovee, Thill, Wood, and Bovel, 1993, p. 76)

Technological forces-"The knowledge, techniques, and activities that lead to profound changes in products or process." (Bovee, Thill, Wood, and Bovel, 1993, p. 76)

Political forces-local, state and federal policies, laws, and regulations that affect institutions.

1. If you are NOT the President of your institution, what is your job title?

   - ❑ Vice President for Student Affairs
   - ❑ Vice President for Academic Affairs
   - ❑ Vice President for Institutional Advancement
   - ❑ Vice President for Business or Financial Affairs
   - ❑ Dean or Vice-President of_____
   - ❑ Faculty
   - ❑ Other (Please Specify) _____

2. Based on the 'Carnegie Classification,' what is your institution's classification?

   - ❑ RES I (Research University I) or ❑ RES II (Research University II)
   - ❑ DOC I (Doctoral University I) or ❑ DOC II (Doctoral University II)
   - ❑ MAI (Master's (comprehensive) University or College I) *or*
   - ❑ MAII (Master's (comprehensive) University or College II)
   - ❑ BAI Baccalaureate (Liberal Arts) College I *or*
   - ❑ BAII Baccalaureate (Liberal Arts) College II
   - ❑ AA Associate of Arts College
   - ❑ AAS Branch Two Year Technical
   - ❑ Religion-Theological Seminary, Bible College, or other institution offering degrees in religion
   - ❑ Medical-Medical School and Medical Center
   - ❑ Engineering-School of Engineering and Technology
   - ❑ Other (Please Specify) _____

3. What is the total student population (professional and graduate, undergraduate) at your institution? (FTE)

   No. of Graduate and Professional (FTE): _____

   No. of Undergraduate (FTE): _____

4. Please specify and name whether your institution is public or private.

   ❑ Public ❑ Private _____ Institution (Name)

5. What is the total annual operating budget of your institution for FY 98?

   $_____

6. What percent of your annual operating budget for FY 98 is directed toward economic development activities?

   _____%

7. What is the total amount of external funding for research or other economic development related activities at your institution?

   $_____

8. What percent of external funding for research is industry sponsored? (research costs underwritten by industry through grants, contracts or gifts)

   _____%

9. To what extent did your institution participate in the following economic development activities from 1988-1998? Please use the last column to indicate if your institution strategically planned for these activities.

ACTIVITY	Not at all	Minimal Effort	Major Effort	Strategic Plan
1. Applied Research				
2. Business Development				
3. Copyrights, Patents and Trademarks				
4. Data Collection and Dissemination				
5. Education, Training & Management, Workforce Development				
6. Funding Procurement				
7. General Technical Assistance				
8. International Trade				
9. Networking and Partnerships				
10. Research and Development				
11. Rural Development				
12. Technology Transfer				
13. Research Parks/Incubators				
14. Other (please describe)				

10. Which external factor(s) influenced your institution's decision to engage in each of the following economic development activities from 1988-1998? Please check all that apply.

ACTIVITY	Social Culture	Political	Economic	Technological	N/A
1. Applied Research					
2. Business Development					
3. Copyrights, Patents and Trademarks					
4. Data Collection and Dissemination					
5. Education, Training & Management, Workforce Development					
6. Funding Procurement					
7. General Technical Assistance					
8. International Trade					
9. Networking and Partnerships					
10. Research and Development					
11. Rural Development					
12. Technology Transfer					
13. Research Parks/Incubators					
14. Other (please describe)					

11. To what extent has your institution strategically planned for the following economic development activities <u>for 1998 and beyond</u>?

ACTIVITY	Not at all	Minimal Effort	Major Effort	Strategic Plan
1. Applied Research				
2. Business Development				
3. Copyrights, Patents and				

ACTIVITY	Not at all	Minimal Effort	Major Effort	Strategic Plan
Trademarks				
4. Data Collection and Dissemination				
5. Education, Training & Management, Workforce Development				
6. Funding Procurement				
7. General Technical Assistance				
8. International Trade				
9. Networking and Partnerships				
10. Research and Development				
11. Rural Development				
12. Technology Transfer				
13. Research Parks/Incubators				
14. Other (please describe)				

12. Which external factor(s) influenced your institution's decision to develop a strategic plan for the following economic development activities? Please check all that apply.

ACTIVITY	Social Culture	Political	Economic	Technological	N/A
1. Applied Research					
2. Business Development					
3. Copyrights, Patents and Trademarks					

ACTIVITY	Social Culture	Political	Economic	Technological	N/A
4. Data Collection and Dissemination					
5. Education, Training & Management, Workforce Development					
6. Funding Procurement					
7. General Technical Assistance					
8. International Trade					
9. Networking and Partnerships					
10. Research and Development					
11. Rural Development					
12. Technology Transfer					
13. Research Parks/Incubators					
14. Other (please describe)					

13. How often do each of the following external factors influence your institution's decisions to pursue economic development activities that are innovative and somewhat entrepreneurial?

External Factors	Never	Occasionally	Often
Social/Cultural			
Economic			
Technological			
Political			

14. What are your institution's current economic development activities? (Please attatch a list or brief description.)

15. How many private sector employers did your institution serve in FY 98?

- ❑ NONE
- ❑ 1-9
- ❑ 10-24
- ❑ 25-49
- ❑ 50-99
- ❑ 100-199
- ❑ 200+

16. Of the employees marked above, how many employees were impacted, either directly or indirectly?

- ❑ NONE
- ❑ 1-99
- ❑ 100-499
- ❑ 500-999
- ❑ 1,000-4,999
- ❑ 5,000-9,999
- ❑ 10,000-14,999
- ❑ 15,000-19,999
- ❑ 20,000-24,999
- ❑ 25,000+

17. What was the total amount of gross revenue generated by such activities in FY98?

- ❑ NONE
- ❑ $1-49,000
- ❑ $50,000-99,999
- ❑ $100,000-499,999
- ❑ $500,000-999,999
- ❑ $1-1.49 million
- ❑ $5-9.9 million
- ❑ $10+million

18. By percentage, what was the primary category or type of business for those businesses who were served by the economic development activities of your institution during FY 98? *(Total should be 100 percent.)*

Agriculture _____

Manufacturing _____

Construction _____

Health Services _____

Other Services _____

Wholesale/retail trade _____

Finance/insurance/real estate _____

Transportation/communications/utilities _____

Government, including education _____

_____ (Total = 100%)

19. Please list your five largest clients in FY 98.

1)
2)
3)
4)
5)

20. Based on the checklist of activities below, please identify activities in which your institution has been engaged in the past, present or plan to be in the future.

Economic Objective	**College and University Roles**	**Past (Prior to 1994)**	**Present (1994-1998)**	**Future (Beyond 1998)**
Human Resource Development	New education programs Continuing education Professional development Distance education			
Economic research and analysis	Economic data gathering Economic base analysis Industry analysis Strategy development			
Capacity building	Training Technical assistance Building partnerships			
Technical assistance	Small bus. dev. centers Productivity centers Industrial extension Faculty consulting			
Research	Centers of excellence Research consortia Cooperative research Industrial affiliates			

Economic Objective	College and University Roles	Past (Prior to 1994)	Present (1994-1998)	Future (Beyond 1998)
Technology transfer	Tech. Transfer program Shared equip/facilities Faculty consulting Sabbaticals			
New business development	Incubators Research park Financing program Enterpreneurship			

21. What do you believe to be your institution's most important economic development activities for the future? Please list the activities in order of importance.

    1.

    2.

    3.

    Why?

22. What is the role of higher education, if any, in economic development?

    Why?

Please indicate the extent to which your institution has been or is currently involved in each of the following activities.

1. means NOT AT ALL INVOLVED
2. means VERY INVOLVED

23. Creation of a patent and licensing office.

    1. ❑ 2. ❑

24. Addition of staff in an existing patent and licensing office.

1. ❑ 2. ❑

25. Development of a public relations campaign to inform possible licensees of inventions available for licensing by the University.

1. ❑ 2. ❑

26. Efforts to make faculty more aware of the commercial applications of any inventions developed in their laboratories.

1. ❑ 2. ❑

27. Use of an outside patent management firm to evaluate inventions and seek license arrangements.

1. ❑ 2. ❑

28. Creation of a new entity outside the research structure of the institution to undertake development and technology transfer of inventions (a non-profit research center, for-profit corporation, etc.)

1. ❑ 2. ❑

In response to the various developments mentioned above, some institutions have made changes in selected academic personnel policies. Has your institution recently (in the last 5 years) developed new policies or changed existing policies in any of the following areas?

29. Patents:

❑ 1. NO
❑ 2. YES
(If yes) what year? _____
❑ 3. POLICY IS CURRENTLY UNDER CONSIDERATION

30. Faculty consulting:

❑ 1. NO
❑ 2. YES
(If yes) what year? _____
3. POLICY IS CURRENTLY UNDER CONSIDERATION

31. Conflict of interest:

- ❑ 1. NO
- ❑ 2. YES
  (If yes) what year? _____
- ❑ 3. POLICY IS CURRENTLY UNDER CONSIDERATION

32. Conflict of commitment:

- ❑ 1. NO
- ❑ 2. YES
  (If yes) what year? _____
- ❑ 3. POLICY IS CURRENTLY UNDER CONSIDERATION

33. Extra compensation:

- ❑ 1. NO
- ❑ 2. YES
  (If yes) what year? _____
- ❑ 3. POLICY IS CURRENTLY UNDER CONSIDERATION

34. Does your institution currently hold any patents?

- ❑ 1. NO
- ❑ 2. YES

35. Does your institution conduct the kind of research that is likely to result in any patents?

- ❑ 1. NO
- ❑ 2. YES

Instructions

A variety of factors are associated with institutions becoming involved in economic development. To what extent have these factors (a) influenced related discussions and/or decisions and (b) encouraged, discouraged or were neutral with regard to considering increasing economic development at your institution within the past ten (10) years?

Point of View

	(a)	(b)
1.	Means no influence	↑means encouraged increased economic development activity
2.	Means slight influence	↓ means discouraged increased economic development activity
3.	Means some influence	→ means neutral concerning economic development activity
4.	Means moderate influence	
5.	Means great influence	

	(circle number) (a)	(circle arrow) (b)
36. Point of view of board of trustees/ regents	1 2 3 4 5	↑ ↓ →
37. Point of view of local elected officials/government	1 2 3 4 5	↑ ↓ →
38. Point of view of state legislators/ government	1 2 3 4 5	↑ ↓ →
38. Point of view of federal legislators/ government	1 2 3 4 5	↑ ↓ →
39. Point of view of business leaders	1 2 3 4 5	↑ ↓ →
40. Point of view of alumni	1 2 3 4 5	↑ ↓ →
41. Point of view of faculty	1 2 3 4 5	↑ ↓ →

42. Point of view of institution president	1 2 3 4 5	↑	↓ →

Faculty and Students

	(a)	(b)
1.	Means no influence	↑ means encouraged increased economic development activity
2.	Means slight influence	↓ means discouraged increased economic development activity
3.	Means some influence	→ means neutral concerning economic development activity
4.	Means moderate influence	
5.	Means great influence	

	(circle number) (a)	(circle arrow) (b)
43. Recruiting, retaining faculty	1 2 3 4 5	↑ ↓ →
44. Ability of faculty to augment their base salaries	1 2 3 4 5	↑ ↓ →
45. Enhancing faculty development	1 2 3 4 5	↑ ↓ →
46. Increasing faculty publishing activity	1 2 3 4 5	↑ ↓ →
47. Accommodating faculty entrepreneurial activity	1 2 3 4 5	↑ ↓ →
48. Recruiting graduate students	1 2 3 4 5	↑ ↓ →
49. Recruiting undergraduate Students	1 2 3 4 5	↑ ↓ →
50. Recruiting noncredit students	1 2 3 4 5	↑ ↓ →
51. Improving research and instructional equipment and other instructional support	1 2 3 4 5	↑ ↓ →

Faculty and Students
(continued)

	(a)	(b)
1.	Means no influence	↑means encouraged increased economic development activity
2.	Means slight influence	↓ means discouraged increased economic development activity
3.	Means some influence	→ means neutral concerning economic development activity
4.	Means moderate influence	
5.	Means great influence	

	(circle number) (b)	(circle arrow) (b)
52. Generating new knowledge and aiding curriculum development	1 2 3 4 5	↑ ↓ →
53. Academic freedom, freedom of inquiry, and open exchange of information	1 2 3 4 5	↑ ↓ →
54. Transmission of knowledge through nontraditional teaching (distance education, conferences, etc.)	1 2 3 4 5	↑ ↓ →

External and Other

	(a)	(b)
1.	Means no influence	↑means encouraged increased economic development activity
2.	Means slight influence	↓ means discouraged increased economic development activity
3.	Means some influence	→ means neutral concerning economic development activity
4.	Means moderate influence	
5.	Means great influence	

	(circle number) (a)	(circle arrow) (b)
55. Assisting start-up business and/or providing technical assistance to established companies	1 2 3 4 5	↑ ↓ →
56. Improving public relations and image	1 2 3 4 5	↑ ↓ →
57. Founding purposes, charter or mission of the institution	1 2 3 4 5	↑ ↓ →
58. Better use of real property (land and facilities)	1 2 3 4 5	↑ ↓ →
59. Proprietary rights, inventions, discoveries	1 2 3 4 5	↑ ↓ →
60. Meeting public service obligations	1 2 3 4 5	↑ ↓ →
61. Increasing industry-sponsored research	1 2 3 4 5	↑ ↓ →
62. Increasing corporate involvement and/or gifts to the institution	1 2 3 4 5	↑ ↓ →
63. Revenue generation through equity participating in commercial ventures, related direct investment	1 2 3 4 5	↑ ↓ →

External and Other
(continued)

	(a)	(b)
1.	Means no influence	↑means encouraged increased economic development activity
2.	Means slight influence	↓ means discouraged increased economic development activity
3.	Means some influence	→ means neutral concerning economic development activity
4.	Means moderate influence	
5.	Means great influence	

	(circle number) (b)	(circle arrow) (b)
64. Fund raising among alumni and other individuals	1 2 3 4 5	↑ ↓ →
65. Tax exempt status of the institution	1 2 3 4 5	↑ ↓ →
66. Increasing state appropriations to the institution	1 2 3 4 5	↑ ↓ →
67. Attracting federally supported research	1 2 3 4 5	↑ ↓ →
68. A strategic, long-term planning process	1 2 3 4 5	↑ ↓ →
69. Potential liabilities of commercialization of research	1 2 3 4 5	↑ ↓ →
70. Transfer of technology, discovery in commerce	1 2 3 4 5	↑ ↓ →

71. List briefly, with or without reference to the above list, the three (3) factors which you believe to be the most persuasive or compelling in encouraging a greater level of involvement in economic development activities at your institution during the past ten (10) years AND list the three (3) factors which you believe to be the most persuasive or compelling in discouraging a greater level of involvement.

Encouraging:

A.

B.

C.

Discouraging:

A.

B.

C.

72. During the past ten (10) years, how would you generally characterize the level of economic development activity at your institution? (please circle number)

1. INCREASING
2. STABLE
3. DECREASING
4. OTHER (please specify)

73. Would you like to tell me anything else about the involvement of your institution in economic development and/or changes, which have occurred in institutional policies? If so, please use this space for that purpose. Also, please make any comments that you think may be helpful in future efforts to understand the relationship between involvement in economic development as well as related activities and changes in internal policies. This information will be much appreciated here or in a separate letter.

APPENDIX C

Cover Letter

DATE

FIELD (First Name) FIELD (Last Name) FIELD (Title)
FIELD (Institution)
FIELD (Address)
FIELD (City), FIELD (State) FIELD (zip)

Dear FIELD (Salutation) FIELD (Last Name):

I am requesting your participation in a study concerning the involvement of colleges and universities in Oklahoma in economic development activities. The purpose of the enclosed survey is to gather data on past, present, and anticipated future economic development activities of all institutions. I am also attempting to determine the external factors influencing institutional decisions regarding such activities and whether the activities are based on strategic planning.

Your institutional participation is important since the survey focuses on an entire population of institutions, and the validity of the results depends on obtaining a high response rate. A postage-paid response envelope is enclosed for your convenience.

Your responses will be held in strict confidence and will not be reported on an identifiable basis.

Thank you in advance for our participation.

Sincerely,

C. A. Taylor

APPENDIX D

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 07-06-98 **IRB #:ED-98-136**

Proposal Title: ECONOMIC DEVELOPMENT AND POLICY CHANGE

Principal Investigator(s): Martin Burlingame, Carolyn Taylor

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:
Comment: Is it necessary to enter question #74 into the database? Could an ID number be used/assigned instead of entering the information in question #74 into the database? Please consider forming your computer database without question #74 and using an ID number instead.

Signature: Thomas C. Collins Date: July 6, 1998

Interim Chair of Institutional Review Board
cc: Carolyn Taylor

VITA

Carolyn Anne Taylor

Candidate for the Degree of

Doctor of Education

Thesis: ECONOMIC DEVELOPMENT AND POLICY CHANGE: AN ASSESSMENT OF THE ECONOMIC DEVELOPMENT ACTIVITIES OF HIGHER EDUCATION IN OKLAHOMA

Major: Higher Education
Emphasis: Political Science Teaching

Biographical:

Education: Graduated from Norman High School in Norman, Oklahoma, in May 1975; received Bachelor of Arts degree in History from The University of Oklahoma in May 1979; received Master of Arts degree in Political Science from The University of Oklahoma in May 1992. Completed the requirements for the Doctor of Education degree at Oklahoma State University in May 1999.

Experience: Taught secondary school and university courses from 1980 to the present at the following institutions: Norman High School, The University of Oklahoma, Oklahoma Baptist University and Rogers State University. Served in the Oklahoma House of Representatives from 1984 to 1992. Currently employed at Rogers State University.