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DISSERTATION

LEGISLATIVE PERCEPTIONS OF THE ECONOMIC IMPACT OF CASPER COLLEGE ON THE STATE OF WYOMING, NATRONA COUNTY, AND ITS STUDENTS: AN EXAMINATION OF THE REALITY OF THOSE PERCEPTIONS

Submitted by

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In partial fulfillment of the requirements for

the degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Summer, 2001

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY F. E. "SKIP" GILLUM ENTITLED LEGISLATIVE PERCEPTIONS OF THE ECONOMIC IMPACT OF CASPER COLLEGE ON THE STATE OF WYOMING, NATRONA COUNTY, AND ITS STUDENTS: AN EXAMINATION OF THE REALITY OF THOSE PERCEPTIONS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Advisor

Department Head

ABSTRACT OF DISSERTATION

LEGISLATIVE PERCEPTIONS OF THE ECONOMIC IMPACT OF CASPER COLLEGE ON THE STATE OF WYOMING, NATRONA COUNTY, AND ITS STUDENTS: AN EXAMINATION OF THE REALITY OF THOSE PERCEPTIONS

As legislators grapple with funding decisions about state supported programs in difficult financial times, they look to business models that provide data about the positive impacts those programs have on their communities and the state. As the demands for tax dollars become more competitive, it appears that programs with the greatest potential to positively impact the economy will be most favorably received and protected by state policy makers. A prerequisite to gaining legislative support for future higher education funding requests is for colleges to develop data to document the impacts that their schools have on the economies with which they interact.

The first purpose of this study was to qualitatively document the perceptions of the Natrona County delegation to the Wyoming State Legislature concerning Casper College's interaction with the earning power of its

students and with the state and local economies. The second purpose was to quantitatively document the interactions of Casper College with the same three economies. The third purpose was to compare the qualitative data with the quantitative data to determine any differences. Finally, the study determined the ratio of taxpayer and student support to the economy.

The findings indicate that Casper College not only has a positive impact on the state and county economies, but also on the earning power of its students who complete either a certificate or associate degree program of study. Additionally, the findings indicate that the perceptions of the legislators indicate that the college has positive impacts on all three economies. However, their perceptions are anecdotal in nature and appear to be based more on a desire to believe than on solid evidence. They, like most people, want to believe in something as obvious as the value of education. Unfortunately, they were not capable of providing any quantitative data to support their beliefs.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Background/Overview

For at least the last decade, local and state governments have spent considerable time and money on efforts to attract new businesses. This governmental action has been justified on the premise that attracting new businesses has a positive economic impact on the community and the state. Even in times of tight budgets states have continued to see value in their economic development efforts, sometimes at the expense of other governmentally supported programs and services including higher education in general and community colleges in particular. Any decrease in funding for higher education may be counterproductive to economic development efforts as pointed out in the 1985 Carnegie Foundation report emphasizing that colleges and universities have a critical role to play in keeping this country competitive economically (Newman, 1985).

The economic health of this great nation is definitely dependent upon the collective ability of the

individual states to encourage and support private sector innovation and competitiveness. Simultaneously, local governments also play a critical role in both the economies of the states and the nation. This is because they provide the basic support services of education, infrastructure, and local tax levies which are essential to the functioning of the private sector (Zeiss, 1986). According to Nathan (1986), governors today seem to be not only willing, but sometimes even anxious, to support higher education because it is seen as a vital resource to the private sector business community. He argued that they are sometimes even willing to work for increased funding for education if colleges can demonstrate that the increased funding will have a positive impact on the economy as well as students. However, the support of the governor alone on this issue will not result in increased funding levels, as all budget bills must first go through the legislative process before they reach the governor's desk.

As legislators grapple with funding decisions about state supported programs in difficult financial times, they look to business models that provide data about the positive impacts those programs have on their communities

and the state. In Wyoming, this type of accountability is becoming intricately intertwined with the process of defending funding requests. It appears programs with the greatest potential to positively impact the economy will be most favorably received and protected by state policy makers. Therefore, a prerequisite to gaining this legislative support for additional funding is for college administrators to develop actual data that indicate the impacts that their schools have on both their local and state economies. It also would be helpful to develop information indicating the impact that attending college has on the earning power of students. Additionally administrators also must have a thorough understanding of how those economic impact data compare to the perceptions their state legislative delegation holds concerning the economic impact of the school on the two economies and on the earning power of its students.

Non-restricted funding for Wyoming's community colleges is comprised of revenue from three primary sources: a county mill levy and motor vehicle tax; student tuition and other institutional sources of funding including fees and revenue from contracts for services; and a general appropriation from the state. The percentage mix of these funding sources for the

Wyoming system of community colleges for fiscal year 2000 was 58 percent state, 17.5 percent local, and 24.5 percent institutional while those percentages at Casper College were 65 percent, 13.7 percent, and 21.3 percent respectively (WCCC Budget Authority, 1999-2000). These percentages confirm that the state is the primary source of funding for community colleges in Wyoming.

The state-funded portion of college budgets originates from biennial general fund appropriations closely tied to a statewide sales tax, severance taxes on mineral production, and interest on state investments: three highly volatile sources of funding. The majority of the local portion of the funds comes from a mill levy (4 mills minimum-10 mills maximum), the amount of which is based on the assessed valuation of property, also an unstable source of funding due to the fluctuation of mineral prices which influence the value of Wyoming land.

In recent budget sessions for the State of Wyoming, elected officials have grappled with the problem of decreasing funds. At the same time, requests by governmental agencies have continued to increase. The result has been closer scrutiny of those agencies requesting funding. A major concern of community college

administrators and trustees alike is that members of the legislature do not fully understand and appreciate the economic value that community colleges bring to their service areas and to the state. Unfortunately, the state's community college leaders have not provided meaningful data to these policy makers quantifying the impacts their institutions have on the state in general and their local communities in particular. The end result may well be an overly conservative legislature when it comes to funding community colleges while aggressively funding untried economic development plans.

The challenge facing community college leadership in Wyoming is to provide accurate research data concerning the economic impact that community colleges have on their local service areas and their state. Additionally, it is imperative to determine how these data compare to the perceptions held by legislative officials. Finally, a process of education must be developed to disseminate these research data in ways demonstrating the value of the colleges when compared to the expenditures necessary to operate them. This would result in a better informed legislature concerning the economic value of Wyoming's community colleges. Consequently, they may be more willing to financially support the colleges at the

expense of other programs that have less impact or are unproven, especially in difficult financial times.

Statement of the Problem

Economic impact studies are of substantial value to community college administrators and faculty because they provide comprehensive data for political purposes. Without them, endeavors to achieve greater local and state appropriations will be handicapped by the lack of tangible and reliable information on the measurable economic returns to be expected from the dollars invested in community colleges (Ryan, 1985).

Caffrey and Isaacs (1971) compiled the first real guide for conducting local economic impact analyses of colleges and universities. Their work was intended to be a common-sense guide to assist interested persons in determining the cost/benefit ratio of an institution of higher education to a local community. Since their seminal work, many institutions of higher education have undertaken such studies, as have several individual researchers. Though this research guide was intended for colleges and universities in general much of its early application was undertaken specifically by community colleges.

The early studies that followed in the 1970s and

1980s tended to apply parts of the Caffrey and Isaacs model to particular community colleges or community college systems (Selgas, 1973; Andrew & Wellsfry, 1977; Bess, 1980; Turiciano, 1980; Kinnick, 1982; Brookdale Community College, 1983; Romano & Herbert, 1985; and Kiser, 1988). The intent of these studies appears primarily to have been for public relations purposes. They seem to have been undertaken to improve the image of the individual college within its local community. This was done by showing the community the contribution that the college made to the local economy.

In the 1990s economic impact studies were expanded to also identify the positive economic impacts colleges had on regions outside their specific service areas, including the entire state. This is seen in the study of El Paso Community College conducted by Andrews and Lillibridge (1990); the Economic Impact Study by Oakland Community College (1992) of Farmington, Michigan; and the study of Arizona's community colleges reported by Rubi (1995). Johnson (1994) approached his economic impact study from a slightly different perspective when he determined the impact of a higher education institution on multiple Texas counties. Researchers have also attempted to compare the economic impact of community

colleges in two different states to determine if they are similar (Singleton, 1994). Again, most of this work appears to have been undertaken for public relations purposes (i.e., improvement of the school's image) and not to enhance the likelihood of funding.

Rouse (1992) moved away from the Caffrey and Isaacs (1971) economic impact model to a human capital approach that looked at individual economic benefits attributable to the educational process. Namely she looked at the returns to the individual after gaining the education, and the gains to the community by having a better-educated citizenry. Beckmann (1996) took a similar course in his dissertation when he examined the net economic impact of Colorado vocational education programs. He looked at wages earned by the student after participation in a vocational education program.

In recent years, a few researchers have undertaken economic impact studies for purposes of educating legislatures about the benefit of community colleges to their local areas (Zeiss, 1986; Caswell, 1988; Leslie & Brinkman, 1988; Brann & Baldwin, 1997). Saleh (1988) approached this same issue from a different perspective. His work examined the impact that state budget reductions

for community colleges would have on the local economies of those institutions.

To date, no studies have been reported that compare economic impact data derived from models similar to those used in the literature and inspired by Caffrey and Isaacs (1971) with the perceptions of local legislators. Additionally, no previous studies have combined the short-term business impact study with the longer-term human capital improvement approach and then compared those data with legislator perceptions. As state policy makers are focusing more on institutional and program accountability, these additional data could prove beneficial in the process of educating local citizens as well as members of state legislatures about the economic and human capital value of community colleges. The development and dissemination of this type of data will help college administrators better influence those persons in control of the initial flow of state funds to the colleges. The results of this study will also assist Casper College in addressing the accountability issues with which Wyoming community colleges are struggling at the system level.

Purpose of the Study

The purpose of this study is four fold. First,

using economic impact models similar to those developed by Caffrey and Isaacs (1971) and modified by Ryan (1983) and others, the short-term economic impact of Casper College on the local and state economy will be determined. Next, a human capital model using wage-record data will be used to determine the impact that completion of a program of study at Casper College has on students' earning power. Third, in-depth interviews of Natrona County's state legislative delegation will be conducted to determine their perceptions of the economic value of Casper College to its service area and the state, as well as the effect that program completion at Casper College has on the earning power of its students. Finally, the data gained from the legislator interviews will be compared to the data obtained from the short-term and long-term models to determine if the perceptions held by Natrona County legislators are supported/verified by the models.

Research Questions

The specific research questions to be addressed in this study are:

1. As measured by the economic impact analysis model, does Casper College impact the

state's economy equal to or greater than the legislative appropriation for the College?

2. As measured by legislator perception, does Casper College impact the state's economy equal to or greater than the legislative appropriation for the College?
3. Is there a difference between the economic impact of Casper College on the state as measured by the economic impact model compared to the legislator perception method?
4. As measured by the economic impact analysis model, does Casper College impact the county's economy equal to or greater than the total county tax levy for the College?
5. As measured by legislator perception, does Casper College impact the county's economy equal to or greater than the total county tax levy for the College?
6. Is there a difference between the economic impact of Casper College on the county's economy as measured by the impact analysis model compared to the legislative perception method?

7. As measured by Wyoming wage records data, is there an impact on earning power for Casper College students equal to or greater than their costs for attending college?
8. As measured by legislator perception, is there an impact on earning power for Casper College students equal to or greater than their tuition costs for attending college?
9. Is there a difference between the impact on earning power of Casper College students as measured by wage record data compared to the legislative perception method?

Definitions of Terms

For purposes of this study, the following definitions will apply:

Business volume impacts—the gross amount of monetary infusion into a specific economy which is generated by an institution or organization.

Certificate—an academic credential awarded to a student who completes a prescribed course of study in a career or technical field consisting of one year of concentrated study in the discipline.

Completers–those students who successfully complete the requirements of one of the degree or certificate programs offered at Casper College.

Degree recipient–those students who successfully complete the requirements for the Associate of Arts, Associate of Science, Associate of Business, Associate of Applied Science, and Associate of Fine Arts degree.

Economic impacts–either business volume impacts, employment impacts or human capital impacts.

Economic impact analysis–a study which provides data concerning the financial contributions that an institution or organization has on its community and state.

Employment impacts–the number of jobs created as a result of expenditures attributed to an institution or organization.

Graduates-interchangeable with completers. Those students who successfully complete the requirements of one of the degree or certificate programs offered at Casper College.

Human capital impacts–the effect that education or training by an institution or organization has on the earning power of individuals.

Local economy—the economy located in the geographic location of a particular institution or organization. For purposes of this research it will be the economy of Natrona County, Wyoming.

Ratio of taxpayer support to economy—the mathematical computation utilized to show the return on investment for both the local and state funding of Casper College.

State economy—the economy of a specific state. For purposes of this research it will be the economy of the State of Wyoming.

Study Limitations and Delimitations

It should be recognized that there are many other short-term variables of an economic impact study that can be measured in addition to those reported in this study. Those that are used in this study were chosen because of their similarity to those components that were reported in previous attempts to measure the economic impact that a community college has on the economy of its state and local community.

Likewise, there are other variables that could be measured concerning long-term impact besides the impact that attending college has on earning power. This element was chosen because it is of interest for economic

development purposes and because it is measured in dollars it is consistent with the measures of the short-term variables. Additionally, in measuring the impact Casper College has on the earning power of its students, this study does not attempt to account for "forgone wages" as discussed by Honeyman, Wattenbarger, and Westbrook (1996). Likewise, it does not attempt to address the issue of the appropriate discount rate when determining return on investment as outlined by Garms (1977).

While the qualitative research approach is suited for measuring legislator perceptions for this study due to the small number of legislators who make up the group to be interviewed, it imposes certain possible limitations inherent in the design. Because this project is intended to answer questions about one Wyoming community college, generalization of the findings to other Wyoming schools may be limited. The very nature of the qualitative interview as a research tool, however, will provide a detailed and rich description of the process that could be replicated for the other six colleges in Wyoming.

The success of this study is dependent on the

willingness of the elected officials representing Natrona County in the state legislature to be thoroughly interviewed about their understanding and perceptions of the economic impact Casper College has on its local community, the economy of the entire state, and on the earning power of its students. This will also be influenced by the truthfulness of those individuals interviewed.

This study does not attempt to measure the social contributions that might be made by Casper College for its students, community, or state. Though this type of information might provide a more complete picture of the overall impact that a college has on its community, state and students it was not developed here because it appeared to be beyond the scope of examining the economic value of a college.

Likewise, there was no attempt in this study to quantify the impact that attendance at a community college has on citizenship. Many college missions indicate that part of their mission is to make better citizens of their students. This author felt that an economic impact study was not the best platform to include data of this type.

Any study of this nature will only provide estimates

of the real economic impact that a community college will have on its community and state. The models that will be used to arrive at these estimates will attempt to show a reasonable and defensible impact of Casper College as an economic entity. As a consequence, the resulting estimates will be conservative in nature and thus will not be an attempt to arrive at an optimum estimate of the college's economic value.

Significance of the Study

Through this dissertation an in-depth economic impact analysis will be conducted for Casper College. This will be the first time in the history of the college that these type of data have been developed and disseminated about how the college interacts with the economies of the state, the county, and its students. Schuyler (1997) called for an expansion of the research in this area and this study will do that.

In addition to the results of this study adding to the body of research that measures the short-term economic impact of specific community colleges, it will also combine those data with a long-term impact source. These figures will be developed through State of Wyoming wage records and will indicate the impact that completing a program of study at Casper College has on individual

earning power. This is something that was advocated by Gritz (1983) when he acknowledged a need to measure the change in the economic value of human resources caused by a community college's education and training activities.

This study will develop data for the first time that identifies the perceptions of state policy makers concerning both the short-term economic impact of Casper College on its community and state, and the long-term impact that the college has on the earning power of its students. After developing these legislator perception data, this study will advance the research even further by comparing these perception data to the data generated by the models. The results of these comparisons will identify any discrepancies among the data sources and can be used in developing strategies to educate the legislature about the economic value that Casper College is to its students, community, and state.

The end result of this study will be a documented process that can be replicated by or for the other community colleges in the Wyoming Community College System. The resulting information can ultimately be used to better influence budget decisions of Wyoming's policy makers, especially in hard economic times when difficult choices in what level to provide funding to competing

programs must be made. It will also provide information for local citizens concerning the economic value their community college brings to the local economy. This could prove extremely beneficial if colleges are contemplating seeking additional local funding in the form of either increases in mill levies or local bond issues.

Finally, this study will provide another accountability measure for Casper College. This one will provide documentation of its measurable economic outcomes, thus providing information in a format with which business leaders and legislators are familiar.

CHAPTER 2

REVIEW OF THE LITERATURE

Background

In examining the impact that a community college has on the economy of its community and state, a foundational principle must be acknowledged immediately. The primary mission of any community college is to educate students in an attempt to prepare them for the journey they will pursue throughout their lives. This education includes remediation, preparing students to transfer to baccalaureate institutions in pursuit of their career path, and job-training efforts intended to educate students to immediately enter the world of work (Lorenzo, 1994). Through this broad mission community colleges have long been advocating the concept of life-long learning by attracting students of all ages and educational backgrounds in an attempt to increase both educational opportunity and access.

The decade of the nineties saw community colleges direct more of their attention to that aspect of their mission that addresses the development of the workforce.

This aspect of the community college mission is intricately intertwined with the economy of a state though it may be difficult to document. Gray and Herr (1998) acknowledged this fact in their book entitled Workforce Education.

> Among all the riches a nation may possess, its people—its human resources, its human capital—is the most important. The value of this human resource depends not on size, however, but on the occupational and intellectual skills its members possess. At least in this regard history is clear: A large unskilled population is a detriment to national economic growth and to a higher standard of living. For this reason most developed industrialized nations have established systems of workforce education, and most underdeveloped nations seek to develop such a system as a prerequisite to improving their economy.
>
> The nexus between workforce education and skilled workforce, and economic development is one reason for federal and state support of programs such as post secondary and technical education and employment and training programs. (p. 41)

There are no guarantees of prosperity in our society, but education appears to provide the most hope for individuals today. Education allows individuals to move up the employment ladder, filling those jobs with higher status and pay. It allows them to have careers rather than jobs (Grubb, 1996). This is true even at the sub-baccalaureate level. Grubb reported that an associate degree or certificate increases the chances of

having a technical position while decreasing the chances of working in the unskilled fields.

Grubb advocated that community colleges do not only have an impact on the earning power of their students, but they also make major contributions to their communities by training the workforce of the twenty-first century. He was so convinced of this fact that he developed a model that saw a symbiotic relationship between education and the workplace. His concept of "ladders of opportunity" allowed workers to enter and exit the education system as needed to upgrade their employment skills. He saw programs that allowed people to be trained in a field, leave education to work in that field, return to the education system to enhance work skills only to return back to the job. Each return to the education arena was seen as being analogous to climbing a ladder which ultimately culminated in the attainment of the baccalaureate degree (getting to the top).

As we approached the new century higher education in general, and community colleges in particular found themselves at a point of intense reexamination from both internal and external sources. Some taxpayers and legislators were asking difficult questions that touched

on all aspects of the community college mission. Should taxpayers pay twice for educational preparation? What is the value of job-specific training in a world where job skills become obsolete in a matter of a few years? How should the transfer curriculum be designed to meet the increasingly divergent transfer requirements of senior institutions? Each of these questions was being (and continue to be) pondered within the context of dwindling resources (Lorenzo, 1994). As a result legislatures began to seek greater means of accountability as prerequisites to maintaining funding levels. One such type of accountability measure was the economic impact study conducted to document the degree to which particular colleges impacted their various economies.

Development of a Short-Term Impact Model for Colleges and Universities

Caffrey and Isaacs (1971), commissioned by the American Council on Education, compiled the first published research outlining a method for conducting an economic impact analysis study by higher education institutions. The model they reported was actually developed by Morton Marcus and Paul Stern with the critical assistance of Marvin Hoffenberg (Caffrey & Isaacs, 1971). It subsequently made a prolonged impact,

as witnessed by the number of institutions and researchers who cite it in their research (Brann & Baldwin, 1997; Lillibridge, 1995; Johnson County Community College 1995; Johnson, 1994; Oakland Community College, 1992; Andrews & Lillibridge, 1990; Saleh, 1988; Leslie & Brinkman, 1988; Zeiss, 1986; Gritz, 1983).

The Caffrey and Isaacs model is quite complex, attempting to provide data for seventy-eight measurable variables through forty different linear cash flow formulas as it works to estimate the economic impact of a college or university on its local economy. It divides economic impact into three primary areas: impacts on local businesses, impacts on local governments, and impacts on local individuals. The models identify who is spending, how much is being spent, what is being bought, and where the spending occurs. The models result in underestimates, and Caffrey and Isaacs concluded that it is better to underestimate than overestimate impacts.

The models are intended to show the sum of all income generated in the economy by the existence of the college or university. The direct and indirect incomes to the local economy are measured by cash flows to households, businesses, and governments because of the expenditures of the college or university as well as its

employees, students, and visitors. The end result is a guide for estimating the number of jobs attributed to the presence of the college or university. It enhances these numbers by calculating second round purchases and jobs through the use of multipliers.

The Caffrey and Isaacs model requires the use of time consuming and costly survey techniques to collect much of the economic data necessary for the calculations. Also a concern to many of the model's detractors was the fact that the model reported by Caffrey and Isaacs was developed for four-year colleges and universities, and as such much of the sought after data are not applicable to community colleges.

When Caffrey and Isaacs's groundbreaking guide to economic impact analysis was introduced, many institutional researchers followed it like a road map. It dominated research design in this area throughout the 1970s and into the 1980s. Researchers in the 1980s began to move away from strict adherence to the original model and began to pick and choose various equations of the model to answer their economic impact questions. Others began to modify Caffrey and Isaacs's work to offer alternatives to the complex model (Schuyler, 1997).

Refining the Model to Apply to Community Colleges

In her dissertation Joan Kaltenbach (1979) concluded that there were two reasons for simplifying the Caffrey and Isaacs model. She noted that many of the formulas were not appropriate for community colleges. She also indicated that the costs associated with implementing the full model were beyond the resources of many community colleges. In her study Kaltenbach initially used only select formulas in the Caffrey and Isaacs model and then compared those results of her scaled down work to results obtained by using their entire model. Her findings with the scaled down model were found to be very similar to those obtained from the full model. Also, her work did not involve the use of costly interviews. Instead she utilized data easily obtained from existing college records. The product of her efforts was a more compact series of formulas that made annual updates much easier.

Ryan (1983) compiled the Handbook for Conducting a Study of the Economic Impact of a Community College after working with the Research and Planning Committee Council of the County Colleges of New Jersey. It was presented as a shortcut model to assist the state's community colleges in conducting economic impact studies. He

advocated for college administrators to conduct such studies by clearly identifying their many purposes.

> An economic impact study should enable a community college to improve its position with its funding source. Community college relations are documented. Political leaders are made aware of the tax burden eased and tax revenues generated. Faculty and staff become more aware of their contribution to the economy. Taxpayers see that their outlay does not just disappear and college administrators have a useful tool in making decisions about the future direction and priorities of their institutions. (p. 2)

Ryan's research tool can be described as a modification to Caffrey and Isaacs's work. It consists of only ten different data sources which require only twenty different calculations. Ryan's research design, like Kaltenbach's (1979), was an obvious attempt to alter Caffrey and Isaacs's work in ways that not only made it more applicable to community colleges but also easier to apply. In addition to omitting several factors Ryan's shortcut model also eliminates the need for extensive and time-consuming survey research, replacing this information with secondary data from the college and from state and federal sources (Schuyler, 1997).

Johnson (1994) offered a justification for this move away from survey data when he indicated that:

> Surveys are subject to question about the accuracy of reported responses. To alleviate

> these concerns, economists and others who conduct these studies increasingly rely on aggregate statistical economic data such as census data. It should be noted that the minimization of reliance on survey data gathered from the institution does not necessarily mean that survey techniques were not used at some time in the data gathering process. After all, even census data that is considered to be an accurate average representation of many societal characteristics is initially gathered by using surveys. The aggregate data reported in census and many other reports such as the Bureau of Labor's consumer expenditure reports typically represent averages for mass groups and are generally assumed to be less susceptible to response errors. (p. 43)

In 1989 the Two-Year Committee of the Eastern Association of College and University Business Officers (EACUBO) developed a Lotus 1-2-3 computer model for manipulating the data collected through implementation of the Ryan model. This computer program was developed in response to a perceived need by the organization to assist community colleges, as well as four-year institutions, with the preparation of economic impact studies intended to determine and communicate the impact that their institutions have upon the counties and the states in which they are located (EACUBO, 1989).

Andrews and Lillibridge (1990) and Lillibridge (1995) successfully utilized this model in preparing economic impact studies for El Paso Community College and

New Mexico State University at Alamogordo. It is worthy of noting that the New Mexico study was undertaken in response to a state legislative request. The end result of both studies was a three-part report consisting of countywide data for the college, statewide data for the college and countywide results of the economic impact study. Like the other models used to estimate economic impact, the EACUBO version of the Ryan model used in the El Paso and New Mexico studies provided conservative data that underestimated the actual economic impact of the colleges. Unlike the other published models it greatly simplified the collection of data (Lillibridge, 1995).

Though his work has not reached the same level of acceptance as the Caffrey and Isaacs model it is one of the most popular today. This is born out in the number of individuals who have either used this model or heavily relied on the author's work when conducting economic impact studies (Saleh, 1988; EACUBO, 1989; Andrews & Lillibridge, 1990; Singleton, 1994; Johnson, 1994; Johnson County Community College, 1995; Lillibridge, 1995; Stokes, 1998).

Brann and Baldwin (1997) took yet another approach to measuring economic impact with their work at Miami-Dade Community College. Using the concept of economic

impact utilized by Elliott, Levine and Meisel (1988) they attempted to provide a simple and useful method for estimating both the gross and net impact that a community college has on its local and state economies. For purposes of the Miami-Dade impact study they described the concept of net impact as:

> the attempt to measure the contribution of the college to the local economy, minus the impact of the college expenditures which originated from local sources. In other words, net impact attempts to measure the additional economic activity generated by the college, above and beyond the level of economic activity which would have occurred in its absence. (p. 1)

These two researchers were quick to acknowledge that the larger the geographic area encompassed by the study the larger the impact will be. This fact comes into play when audiences attempt to compare various economic impact studies. Therefore, the researcher must clarify for the audience the geographic area covered by the analysis, the major categories of spending included in the analysis, and the scope of the analysis (Brann & Baldwin, 1997). Though this approach is the most recent change in method, it does not appear to be influencing other studies at this time.

The Multiplier

For data collection purposes the Miami-Dade study

utilizes a model developed by the U. S. Department of Commerce which estimates economic impact by multiplying industry expenditures by the multipliers associated with each industry. Gross impact, net impact, and the impact of resources originating locally are estimated separately, in order to provide more information for planning, decision-making, and meaningful comparisons (Brann & Baldwin, 1997).

A concept that is common to most of the economic base models previously discussed is the construct known as the multiplier (Caffrey & Isaacs, 1971; Ryan, 1983; Zeiss, 1986; Saleh, 1988; Andrews & Lillibridge, 1990; Oakland Community College, 1992; Johnson County Community College, 1994; Lillibridge, 1995). The multiplier is applied to college-related expenditures and is used to reflect the total amount of wealth generated by those expenditures (Leslie & Brinkman, 1988). As discussed in the Oakland Community College study (1992), the multiplier works in the following way.

> For each dollar of initial spending in the...economy, a proportion is spent again within the area for further goods and services. The remainder is removed from the economy in the form of savings, taxes and spending on goods and services outside the county. A second round of expenditures then occurs with a proportion again being recycled within the

> county's economy. This process continues with diminishing increments at each stage. (p. 3)

Caffrey and Isaacs's explanation of this concept initially set the standard for measuring the multiplier effect and has been referenced in most economic impact surveys that have been conducted. In their seminal work, Caffrey and Isaacs explained the concept as follows:

> Approximately 35 cents of a dollar spent in local business establishments by community residents is returned to the spenders as income. The balance, approximately 65 cents, is spent by local business establishments for materials and supplies from other local enterprises (including local taxes) or for goods and services produced outside the community (including nonlocal taxes). But this is only the first round of transactions. The income accruing to local residents from this initial round is partially respent in the local business community. (Some is saved; some is paid out in taxes and fees to federal, state and local governments; and some is spent outside the community.) Again, on the average, 35 cents of the dollar spent locally is returned in the form of income. This recycling process continues with diminishing increments at each stage. Eventually, income received by local residents from the initial dollar spent totals approximately 66 cents. The ratio of total income, 66 cents, to the initial income received, 35 cents, is almost two to one, 1.9:1.0.
>
> 1.9 is called the income multiplier since it measures the multiple impact of an initial income stimulus. The concept is useful in demonstrating the various repercussions of direct stimuli such as the described consumer spending and income. (p. 44)

Multipliers are used to estimate the indirect effects of two major components of the economic system: the direct expenditures toward products and income accrued from wages and salaries paid as a result of those direct expenditures. This phenomenon can easily account for half of the total economic impact of an institution. It becomes obvious that it is for this reason that it is included in most economic impact studies that track cash flow (Schuyler, 1997).

Long-term Economic Impact Studies

A different approach to measuring the impact of community colleges on their local and state economy has focused on what is referred to as human capital investment. Under this approach the researcher views the money, time and effort that an individual or government spends on education as an investment in human capital. Whether or not this is an effective investment is a matter of defining exactly what is expected as a return on the investment (Rubi, 1995). The State Board of Directors for the Community Colleges of Arizona measured that state's return on its investment in community colleges using this method. They provided data that documented average wage rates of individuals who have various distinct levels of education ranging from less

than a high school degree to obtaining a doctorate. They also create an argument that provides evidence that community colleges are responsible for large numbers of students who continue education beyond the community college. This argument is used by them to attribute part of the value of the bachelor's degree to the community colleges.

Does the increase in average income justify the cost of school for the student who obtains an associate degree? Does the increase in average income signify increased revenues for the state that offset the original cost to the state? The answers to these two questions will determine whether there is a return on investment for the state's part in paying for a person's community college education, and for the individual's investment (Rubi, 1995).

The Community College of Philadelphia incorporated this approach in its economic impact analysis. It used the data generated in an attempt to show long-term return on investment, something the other methods do not usually address. In combining human capital investment with a scaled down version of the traditional short-term analysis Grosset, Hawk, Irwin, and Obitz (1995) were able to conclude that:

> .....human development is one of the most important aspects of the Community College of Philadelphia's mission and the human capital returns on investment in a higher education at CCP are many. Successful participation in CCP's educational programs results in individuals who are more employable, capable of greater productivity, advance more rapidly in their chosen careers, are more inclined to improve their capacities through continuing education, and are likely to have higher earnings over a working lifetime. (p. 15)

David Bullard (1999) described the process involved in estimating wage differentials based on education and other variables. In his treatise he traces the economic theory of wage differentials from Adam Smith through the present time. In this process he identifies the various variables that can be considered when differentiating wages of workers. He also explores the use of regression analysis to predict the wages a person will likely earn based on those variables (age, gender, level of education, occupation, industry, race, and region of the country). At the conclusion of the article he points out that the level of education a worker has attained is a positive and significant predictor of earned income.

Mundhenk (2000) discussed the feasibility of utilizing unemployment insurance data to document the success of community colleges in providing a trained workforce to their communities and states. His work came

on the heals of a roundtable of representatives of several states, the federal government and the American Association of Community Colleges organized to discuss the current status of utilizing such records. Though the author did not specifically discuss the ability of such records to determine earning power of individuals based on level of education several of the schools involved in the roundtable were in the early stages of such efforts.

In attempting to measure the human capital impact of education it is important to identify exactly what will be included when determining the actual cost of the education. Students enrolled in higher education today obviously incur costs associated with tuition and fees, room and board, and books and supplies. However, the largest cost of higher education is what economists refer to as opportunity costs involving what they call forgone earnings (Honeyman et al. 1996).

> In other words, opportunity costs or forgone earnings represent the income that the average student could have earned had he or she been employed. This total of forgone earnings is an important consideration for college students who may give up substantial income while attending school….Calculation of earnings that students forgo while in school is highly problematic, and estimates of earnings forgone are, at best, reasonable approximations. (p. 32)

Additional complexities of measuring human capital impacts are pointed out by Garms (1977). He discusses the fact that economists have been able to provide evidence that indicates the return on investment in education is substantial. He also provides evidence indicating that the actual figures are not as great as many people believe. This is due to the concept of the present day value of money to be invested compared to its future value when benefiting from the earlier investment. This idea takes into consideration that money has time value, and therefore the concept of current earning power really needs to be thoroughly examined when trying to quantify future earnings attributed to the initial investment in education. To appropriately adjust current dollars to reflect their value in the future requires the application of the discount rate as calculated by economists to compute the present value of money. The higher the discount rate, the greater value one puts on present day money compared with money in the future. This can be likened to financing a house over thirty years at a specific interest rate. The actual cost of the house at the time it is paid off will be noticeably more than the initial price. According to Garms (1977) it is this discrepancy in the value of money between the

two time periods under scrutiny that must be taken into consideration when quantifying the value that education holds for its students in relation to future earning power is determined.

Summary Research

Several authors have devoted time to academically examine the value of economic impact studies in general. One such scholarly work is the article written by Elliott, Levine, and Meisel (1988). This treatise emphasizes the value of economic impact studies to higher education and summarizes the changes in method since the 1971 work of Caffrey and Isaacs. These authors also discuss the effectiveness of using alternative survey methods to develop the personal expenditure data used for these type of studies. They conclude their work by identifying a need for future researchers to move in ways that will incorporate the economic development aspect of the community college mission into attempts at determining the college's impact on a region.

Another valuable resource presenting a general discussion of the use of economic impact analysis in higher education was published by the American Council on Education and authored by Leslie and Brinkman (1988). In this work the authors analyze and evaluate the methods

used in more than twenty-five impact studies. They include specific suggestions for methods to use when estimating economic impact and on selecting appropriate multipliers.

Dean (1991) also presented an article outlining the common approaches used for estimating economic impact by higher education institutions. The article describes the basic elements, methods, advantages, and disadvantages of conducting an economic impact study. He cites four reasons for conducting these studies: to lobby state legislators for funding; to answer concerns about the institutions impact on local public services; to assist in fighting economic crises; and to satisfy curiosity.

Stokes (1998) offered one of the most comprehensive overviews of the various ways to examine the local economic impact of higher education. His work identifies two major types of studies, the expenditure impact study and the knowledge impact study. He further identifies several categories in each type of study, including what he coins the ACE studies (those spawned by the Caffrey and Isaacs report) and the human capital studies (those that show the relationship between education and earning power). Stokes concludes by advocating for future

economic studies to be based on multiple criteria for a broader, more accurate picture of the true impact of the college.

CHAPTER 3

METHOD

Research Approach

This dissertation utilized both quantitative and qualitative methods in answering the research questions. The study is also descriptive and comparative in nature as it presents those data sets. Two distinctly different types of data were developed from different sources.

Initially, Ryan's (1983) modification of the Caffrey and Isaacs model was utilized to quantitatively determine the short-term economic impact of Casper College on Natrona County and the State of Wyoming. For purposes of this study, the actual budget for the 1999-2000 fiscal year was utilized. Next, utilizing wage record statistics about Casper College program completers gathered through the Wyoming Department of Employment, data was utilized to quantitatively determine what long-term economic impact Casper College has on the earning power of its degree and certificate holders. These data are descriptively presented in chapter four of this study.

Next, in-depth qualitative interviews were conducted with the individuals who comprise the Natrona County state legislative delegation to determine their individual and collective perceptions of the short-term economic impact that Casper College has on Natrona County and the State of Wyoming. The interviews also developed information to determine legislator perceptions of the long-term impact that Casper College has on the earning power of its program completers. These perceptions are also descriptively presented in chapter four.

After these data have been developed and presented, the legislative perception data were compared to the data generated from the short-tem economic impact model. These results were also openly discussed in chapter four. Additionally, the legislative perception data was also compared to the long-term wage record impact data. Likewise, these results are thoroughly discussed in chapter four.

Identifying Casper College's Impact on the Economy of Natrona County and the State of Wyoming

Data concerning the impact of Casper College on the economy of Natrona County and the State of Wyoming was developed utilizing the impact analysis model modified by

Jeremiah Ryan (1983, 1985). This particular tool has been widely accepted as accurate and reliable for quantifying the impacts that a community college has on its local and state economy (Two-year College Committee of the Eastern Association of College and University Business Officers, 1989; Andrews & Lillibridge, 1990; Lillibridge, 1995).

In determining the impact on local and state economies, the Ryan (1983, 1985) adaptation of the Caffrey and Isaacs economic impact analysis model generates information concerning a variety of distinct areas.

1. Total college expenditures
2. Percentage of college expenditures spent in county
3. Percentage of college expenditures spent in state
4. Total number of college employees
5. College employees who live in county
6. College employees who live in state
7. Total disposable income available to college employees
8. Total number of full-time students
9. Total number of part-time students
10. Average annual college related expenditures by full-time students
11. Average annual college related expenditures by part-time students (p. 10-11)

As recommended by Ryan (1983, 1985) the sources for this information will come from a variety of existing documents and reports compiled by the college and state

or federal agencies (the data sources for the above required information corresponds with the same numbers).

1. End of fiscal year audit
2. Actual calculation of all in county Purchases
3. Actual calculation of all in state purchases
4. Student activities records
5. Payroll records
6. Address information on payroll records
7. Address information on payroll records
8. College business records
9. Wyoming Community College Commission enrollment audit
10. Wyoming Community College Commission enrollment audit
11. Financial aid calculations
12. Financial aid calculations (p. 10-11)

A variety of calculations are required to ultimately complete the estimation of economic impact analysis (the formula is presented in Chapter 4). These calculations will identify impacts on both the local (Natrona County) economy and the state (Wyoming) economy. These figures are compared to both the state appropriation and the county tax levy indicating the ratio of taxpayer support to economy for both the state and county.

Identifying Casper College's Impact on the Earning Power of Its Students

Information concerning the earning power of students who graduate from Casper College or complete one of its certificate programs was developed through State of

Wyoming wage records. The population of study for this portion of the research project consisted of only those students who successfully complete one of the one-year certificates or obtain one of the associate degrees that Casper College is authorized to award. This population does not include those students who leave the college prior to achieving the status of program completer or graduate. Some of the students who become graduates or program completers at Casper College may have previously attended other institutions of higher education but they must have obtained the status of graduate or completer of a recognized Casper College program to be part of the population that was studied and compared to non-Casper College completers.

Wage records are reported in Wyoming to assist employers and government agencies in evaluating the average wage for the various employment fields and the number of jobs in various employment categories. Ultimately, they are used to assist in attracting business and industry to the region.

Data indicating the impact that education has on the earning power of Casper College graduates was obtained from the Wyoming Department of Employment, Research and Planning Division. Casper College has implemented a

memorandum of understanding with the Department of Employment that will result in the development of data indicating the impact that completing a Casper College program of study has on the earning power of its students. Though controversial because all students will be tracked after leaving college via their social security number, the joint endeavor is primarily aimed at those students enrolled in the various occupational programs that the college offers. The purpose of this research partnership is to develop student outcomes data that will help improve the effectiveness of the career and technical programs that the college offers. Additionally, these data will be used for reporting purposes required by the Workforce Investment Act. The Wyoming Department of Employment will use the data that are developed to assess its work force development efforts and will encourage other colleges to also establish such joint endeavors.

The data are obtained by matching wages and social security numbers of completers each year. The students who are located in the wage records of the state will be tracked over subsequent reporting periods and wage differentials will be identified between workers who attended Casper College and those who did not. Ultimately

the wages for these two groups will be compared to the individual averages to show the impact that investing in higher education at Casper College had on the earning power of those students.

This system will allow for identifying the earning power of the student prior to attending college, while attending college and after leaving the school. The Casper College cohort was compared to the non-college workforce so as to show the actual wages earned while attending school (forgone wages) and the impact on earnings after leaving school. The earnings are reported quarterly so figures show how long it takes students to surpass the earning power of non-college workers

A pilot run on available data to test this process was conducted in the fall of 1999 with a cohort of students who graduated in 1996. The results indicated that after entering the employment field of their study, Casper College students averaged higher wages after the third quarter of employment than the average for non-Casper College graduates in the same industry. Additionally, it indicated that the salary of the College's graduates increased at a greater pace than their non-college colleagues.

Identifying Legislator Perceptions About the Impact that Casper College has on the Economy of Natrona County, the Economy of the State of Wyoming, and on the Earning Power of Its Students

The process of developing legislator perceptions was dependent on interviews of the twelve individuals elected from Natrona County to serve in the Wyoming Legislature. These twelve individuals constitute the entire Natrona County delegation. Because of the small numbers involved the elected officials were treated as one group. Though this resulted in the inability to differentiate between the perceptions of senate and house members and the perceptions of democrats and republicans, it insured confidentiality, and made it difficult, if not impossible to identify individual perceptions.

Each interview was designed to develop the same type of data that are generated by the economic impact analysis models and the wage differential model. By the fact that the data developed from the models would be applied to the revenue sources from each contributor (state, local, and student) to indicate return on investment, each interview also included questions designed to determine the perception of the legislators on those subjects.

The interviews of each legislator were transcribed to preserve the rich discussions, allowing for better coding and subsequent analysis.

Researcher's Point of View

In qualitative research, the researcher is the primary data collection instrument and therefore it is important that (s)he discuss issues that could influence the outcomes of the study (Snyder, 1998). As a professional educator who has spent twenty-nine years in higher education I have developed a deep interest in the role community colleges play in society. This interest encompasses issues including mission, finance, legislative relations, assessment, and accountability. The in-depth economic impact study that this study is concerned with will complement each of these issues and will allow me to advance my knowledge base and understanding of each. My interests have focused on these issues of late not only because of my graduate coursework, but also because of the evolution of my higher education career and my increased desire to become a community college president.

Over the last two years this researcher has become more involved in the economic development endeavors of the City of Casper and the State of Wyoming. As a result

I have become more conscious of the economic impact that potential businesses have on the economies of the county and state. This same type of information about existing businesses in general and higher education institutions in particular should be developed to assist decision makers in formulating policy concerning funding matters.

In the qualitative portion of this research endeavor I will work hard to maintain my neutrality and objectivity as I interview the members of the legislature and evaluate the subsequent data that emerges. I do not intend to do anything that would favor one perspective over any other. My purpose in conducting this study is to accurately report the perception data and then compare it to the data developed through the economic impact analysis model and the wage record data.

Data Analysis Plan

The data developed from the economic impact model indicates the minimum dollar impact that Casper College has on its local and state economy as derived from spending patterns of the institution, its employees, and students. These figures were enhanced by the application of the multiplier effect that takes into account the rolling over of those dollars in the local and state economy. The resulting figure identified a minimum

impact that the college has on the economy from those sources.

Additionally state wage records were used to show the impact that higher education at Casper College has on the wage earnings of its former students. These figures were compared to the costs that the average student spends on tuition and fees while attending school. Though foregone earnings were not specifically considered the model used provided an average earning before college, while in college, and earnings after college to more accurately reflect the true impact that attending Casper College has on earning power.

Data developed from the interviews was evaluated with HyperRESEARCH, an appropriate qualitative research software package for this type of study. The resulting findings were ultimately presented in a way that the results could be compared to the model generated data for both impact on local and state economies and on student earning power.

CHAPTER 4

RESULTS AND FINDINGS

Introduction

This study took a multiphase approach to examining the research questions. First, perceptual data were obtained through a series of personal interviews of the entire Natrona County delegation to the fifty-sixth Wyoming State Legislature. Second, College student records were merged with State of Wyoming wage records to determine to what degree education impacts earning power. Third, College financial data were evaluated through the use of the economic impact analysis model used by Ryan (1983, 1985) to determine the financial impact the College has on the local and state economies. Finally, legislator perception data were compared to the wage record data and the economic impact analysis model data to determine the validity of the perceptions that one Wyoming county's state legislators hold regarding these questions.

On average the state provides about 60 percent of the funding for the community colleges in Wyoming. It is

for this reason that the perceptions of the Natrona County state legislative delegation are important, as this group of individuals plays a significant role in determining the funding level for the community colleges in Wyoming. If there is a major difference between their perceptions about the impact of the College on the various economies, College officials should engage in an effort to educate the delegation about the true value of the College to both the local area and the State of Wyoming. This education effort should be undertaken regardless of the results of the research because the decision makers of the state have a need to better understand those agencies they fund.

Natrona County has a twelve-member delegation serving in the Wyoming Legislature. Eight serve in the State House of Representatives and four serve in the State Senate. The house members are elected for two-year terms while senators serve four-year terms. Individual state legislative tenure ranged from newly elected to eighteen years. The mean tenure is 8.08 years, while the median is 8 years. The delegation is comprised of nine men and three women.

Interviews were conducted between November 30, 2000, and January 31, 2001. This interview schedule represents

that period of time immediately after the general election and (except for the interview of one senator) prior to the start of the legislative session. This time frame was desirable because it would allow for the current legislative delegation to be identified by the voters, and it would be early enough for them not to have had their perceptions influenced by the lobbying associated with the typical legislative session.

All interviews were transcribed verbatim and a quality-reliability check indicated that the transcripts were reflective of the interviews and thus were reliable. All legislators were asked a series of questions that sought to identify and record their perceptions about the various ways that Casper College interacts with a variety of economies. The analysis of the data proceeded as discussed by Creswell (1994, 1998) for phenomenological data analysis. Each of the transcripts was subjected to the process of reduction in an attempt to identify themes while searching for possible meanings. HyperRESEARCH was used to assist in coding the interviews and revealing the patterns that were present.

Impact on Future Earning Ability

Does completion of a course of study at Casper College have a positive impact on one's earning power?

This question is often asked and the answers that are offered usually coincide with individual perceptions.

Legislator perceptions. For purposes of this part of the study, there were two areas of primary interest. Legislators were asked whether they believed that attending Casper College made a difference in the ability of a student to get a job. They also were asked to discuss their thoughts concerning the relationship between attending Casper College and increased earning potential (the return on the student's investment in college).

The analysis of the coded data indicated five different general types of perceptions concerning the benefit that attending Casper College has on students' ability to obtain a better job and enhance their earning power. The categories of legislator beliefs were easily classified as follows:

- Clear and Convincing Benefit—The legislator was not hesitant in acknowledging that there was a definite benefit.
- Graduated Benefit—The legislator indicated that there was a benefit but it may be influenced by variables such as program and length of study.

- Qualified Benefit—Legislators were able to see benefits for some people but not necessarily an equal one for all who attend.
- Improved Job Skills—The legislator believed that Casper College provided an avenue for students to improve their job skills and either get a job or advance in their current position.
- Small Investment—The legislator believed that the cost of attending college in Wyoming was small making it easier for students to realize a return on their investment.

Legislators often held perceptions that could be placed in more than one of the categories. Only three legislators had a clear perception that was categorized in one category only and none of the legislators held perceptions that crossed the entire spectrum of categories. Table 1 indicates the type of benefit identified and the number of legislators who held that perception.

Table 1

Categories and Frequencies of Legislator Perceptions

Legislator	Perceptions				
	Clear And Convincing Benefit	Graduated Benefit	Qualified Benefit	Improved Job Skills	Small Investment
One	X				
Two	X	X		X	X
Three	X		X	X	
Four				X	
Five		X	X	X	X
Six	X				
Seven	X	X			
Eight	X	X			
Nine	X			X	
Ten		X	X		X
Eleven	X	X			
Twelve	X		X		X

Though nine legislators held perceptions that could be classified as clear and convincing about the role that education plays in the ability to enhance one's earning capacity, not one of them offered an estimate as to how much that difference might be. Their unwillingness to volunteer statements about the amount of difference that attending college might make in the earning potential of a person seems to be based more on the long held truism that "if someone goes to college it will obviously result in the ability to obtain a better paying job than those individuals who do not attend college." Their statements appear to be based more on feelings than

facts. Table 2 presents the legislators' perceptions that recognized a clear and convincing benefit to attending college relative to later earning power. Sometimes more than one statement of a particular legislator could be classified as indicating a clear and convincing belief in the benefit of college.

Table 2

Legislator Perceptions: Clear and Convincing Benefit

Legislator	Perceptions
One	Absolutely.
Two	Absolutely.
Two	There is no question about that.
Three	I feel strongly it improves your opportunity to make more money and it improves your chances of getting a job.
Six	Of course it does.
Six	Yes, that certainly is true.
Seven	It's a big elevation.
Eight	I think there certainly is, because if you get an associate's degree it's going to help you get a job that pays more money.
Eight	I certainly think that's money well spent.
Nine	It definitely impacts them.
Nine	That in return means a better salary for those people than they would have had.
Eleven	I think it is very clear.
Twelve	I believe it to be a good deal.

Six legislators provided responses indicative of a belief in a graduated benefit to attending college. They indicated that earning power was likely impacted by attending college but that the longer a student attended the more likely there would be a positive impact. One legislator acknowledged that program selection in college also played a role in enhancing one's wages. It is interesting to note that one of the legislators who had previously indicated a clear and convincing benefit went on to recognize that there was a general expectation that education was related to better paying jobs. The only legislator to offer a specific percentage that attending college impacts earning ability is among this group. Table 3 presents the legislators' perceptions that there was a graduated benefit.

Table 3

Legislator Perceptions: Graduated Benefit

Legislator	Perceptions
Two	I think that there is the general expectation that when a student goes to college they are going to have a better paying job.
Five	But ultimately, we hope to be able to provide a little bit better for our families by way of enhanced salary or improved working salaries and conditions, which again makes us a success in life and so therefore education is equated with success in life.
Seven	I'd say we would be comparing a high school graduate's income against an associate's degree or even in some cases bachelor's degree, and in some cases even higher degrees.
Seven	I would guess you are on the order of 10% or greater for each on of those steps.
Seven	Each step completed in your higher education would lead to nominal, say 10% increase in earning potential
Eight	But, any time you can enhance your education by an extra year of two or three or four or six or whatever or even go for a doctorate, its certainly going to enhance your earning ability.
Ten	Obviously, the higher they go up in their education the better their earning capacity is going to be.
Eleven	I have a thing set up that shows the progression in the nursing area, where the CNA people get a dollar or two above the minimum wage, add another couple dollars, almost up to the state average wage, for the people that are LPN's and then for the one's that get an RN training you're going up fifteen or twenty dollars an hour probably.
Eleven	And that kind of progression holds for a whole lot of different occupations that in this day and age somebody, particularly somebody just starting out with just a high school degree is likely to not do very well until they acquire some skills that you get at Casper College.

The fewest number of legislators provided discussions that could be labeled as being in the qualified benefit category. Individuals in this group seemed to indicate that there might be a monetary benefit to attending college, but they offered some type of qualification for their position. This appeared to be the true stereotypic politician speaking. They were reticent to take a position against something as obvious as the value of higher education, but they also wanted to provide themselves some room to negotiate if the perceived benefit actually does not prove to be real. This is the group that couches its answers in terms like "as a general rule" and "stands a better chance." They talked as though they wanted to believe, but they wanted to be cautious just in case the study provided different information for Casper College. Table 4 presents the legislators' perceptions that there was a qualified benefit to college relative to after college earnings.

Table 4

Legislator Perceptions: Qualified Benefits

Legislator	Perceptions
Three	As a general rule, they would make more money.
Three	They would also stand a better chance of getting employment.
Three	It would increase their chance of getting a ob over someone that didn't have the education.
Three	Yea, if you can get a better job.
Three	Some are probably benefiting a lot more than others depending on what course they take and what the demand is for that at the time.
Five	Even the non-brightest student realizes that a student loan, a very small student loan, is repayable within a very short time frame should he become successful in his educational endeavor at Casper College or wherever.
Ten	From what I hear it's got to be one of the better deals.
Twelve	I do not know exactly how much they're paying, but I believe it to be a good deal.

Five legislators discussed their perceptions of Casper College's role in providing opportunities for improving job skills. Some spoke of specific programs that they were aware of either because of media coverage or first hand knowledge as business owners. They clearly discussed the impact that the college has with dislocated

workers and in training employees for new businesses. These data are presented in Table 5.

Table 5

Legislator Perceptions: Improved Job Skills

Legislator	Perceptions
Two	I think that the college makes a terrific impact on returning students, who have been dislocated from their jobs.
Two	They see they're not going to get any further without additional education, or displaced homemakers for instance who maybe haven't been in the market place but need to be in the market place, and the way they can get there is through additional education.
Three	So, there are things even if you get a job that are not directly related to your degree sometimes you know, sometimes that degree still helps you get the job.
Four	Specialized training as we mentioned with Becker and Boise Cascade and there's also the crafts area where you can get into diesel mechanics and welding and then some of the specialty skills like nursing and the technology lab for how you help handicapped people survive at home or survive better at home. Those types of educational things are really good for students.
Five	A student who insists on his right to go enhance his educational abilities is essentially either looking to improve his or her capabilities in the job that they are currently in or they choose to seek another career.
Nine	They come out in an area or a field where they can go into the workplace and be an asset to the company from the get-go, rather than trying to train them from day one up to where they need to be at the time they walk out of the college.
Nine	It means a better product for our company or for any other company because you've got someone that's already trained and available that you don't have to bring through all the steps to get them where they are a productive individual, to make you some money, to further your business.

The final legislator perception that could be identified was concerned with the obvious benefit that was available to students because of the low cost associated with attending Casper College. Table 6 provides legislators' perceptions on a small investment for the benefit.

Table 6

Legislator Perceptions: Small Investment

Legislator	Perceptions
Two	I think statistically, it costs way more to educate a student than tuition applies.
Five	With Wyoming tuitions being as low as they are, the raw cost of education to an entry-level student at a community college in Wyoming is seriously undervalued.
Ten	Having that opportunity to do it at probably one of the lowest cost levels in the country would have to make it available to a greater percentage of the students, and particularly local students.
Ten	They're paying roughly 17% of the total cost.
Twelve	I believe (the cost) to be a good deal when compared with other higher education institutions.

Interpretation of the perceptions. The Natrona County state legislative delegation's perceptions are

indicative of beliefs that are valid on their face and as such, people often believe there is no need to ask for hard data to support them. It appears that the people charged with making funding decisions believe, or want to believe, that people who attend college will be rewarded with better paying jobs that allow for a higher standard of living. This makes selling the costs of higher education easier for them. Their perceptions were primarily anecdotal in nature and were not supported with any type of hard data except for an estimate of a 10 percent increase in income for each level of education achieved. This qualitative information is crying for quantitative data to evaluate the foundation on which these beliefs are held.

Wage record data. In recent years a small number of colleges have been engaged in attempts to obtain more reliable information concerning what students earn after they graduate by using wage record data to see the actual impact that attending college has on earning power (Mundhenk, 2000). In 1999 Casper College entered into a memorandum of understanding (MOU) with the Research Department of the Wyoming Department of Employment to share data about graduates of Casper College. The primary purpose of the collaboration was to develop

information that could be utilized to improve the College's programs. The project merges graduation data from the College with wage record data from the Department of Employment to allow the College to gain accurate information about how graduates interact with the Wyoming work world. Simultaneously, this project documents the impact that completing a program of study has on a student's earning power. Additionally the College was concerned with how its program offerings matched the job market for the local area. Finally, employers would be surveyed by a third party and more reliable information would be gathered concerning the College's effectiveness in providing a skilled workforce. Data developed under this MOU would be used to make program improvements to better prepare students to apply the skills necessary to succeed in the labor market.

The resulting data are not without their limitations, however. As pointed out by Mundhenk (2000) wage record data only accounts for those individuals working in a particular state, Wyoming in this instance. It also has limitations within each state. Not found in these records are individuals working for the federal government, persons in the military, farm workers and persons who are self-employed. Even with these

limitations these data are better than self reported data gained from graduate surveys, because this system tracks the person each quarter as they actually interact with the employment market and the actual earnings are reported by employers who are more inclined to report accurate wage earning data.

For purposes of this study, students who graduated from Casper College during the years 1996, 1997, and 1998 were used as the study population. Because many factors other than education can influence earning power a stratified, random control group was also selected for each graduation year from the general workforce and initially controlled for age and gender only.

The initial data that were gathered compared Casper College graduates, those students obtaining a degree or certificate, against the entire Wyoming workforce, controlled for gender and age. Data for this initial comparison were developed during the year immediately following graduation. Tables 7, 8, and 9 provide the annual salary earnings for college completers (grouped by age and gender) and compare those numbers to the earnings of the entire working population (controlled for gender and age).

Table 7

How 1996 Casper College Graduates by Gender and Age Interact with the Wyoming Economy in 1997

Age	Gender	Grads	Number Working	% Working	Mean $ Grads	Mean $ all Workers
<=24	Female	139	99	71.2	$8,122	$ 6,845
<=24	Male	106	78	73.6	$9,929	$ 9,105
<=24	All	245	177	72.2	$8,919	$ 8,608
25-34	Female	63	41	65.1	$15,540	$11,926
25-34	Male	33	25	75.8	$13,448	$17,052
25-34	All	96	66	68.8	$14,748	$15,162
35+	Female	71	49	69.0	$15,342	$15,968
35+	Male	29	16	55.2	$26,150	$28,896
35+	All	100	65	65.0	$18,002	$23,672
Total	Female	273	189	69.2	$11,603	$10,859
Total	Male	168	119	70.8	$12,850	$16,638
Total	All	441	308	69.8	$12,085	$14,376

Table 8

How 1997 Casper College Graduates by Gender and Age Interact with the Wyoming Economy in 1998

Age	Gender	Grads	Number Working	% Working	Mean $ Grads	Mean $ all Workers
<=24	Female	131	88	67.2	$8,240	$7,646
<=24	Male	101	71	70.3	$9,559	$9,800
<=24	All	232	159	68.5	$8,829	$9,388
25-34	Female	50	39	78.0	$11,985	$12,659
25-34	Male	33	23	69.7	$15,154	$17,897
25-34	All	83	62	74.7	$13,161	$16,014
35+	Female	70	54	77.1	$12,157	$17,018
35+	Male	19	11	57.9	$23,575	$29,997
35+	All	89	65	73.0	$14,090	$24,731
Total	Female	251	181	72.1	$10,216	$11,438
Total	Male	153	105	68.6	$12,253	$17,206
Total	All	404	286	70.8	$10,964	$15,254

Table 9

How 1998 Casper College Graduates by Gender and Age Interact with the Wyoming Economy in 1999

Age	Gender	Grads	Number Working	% Working	Mean $ Grads	Mean $ all Workers
<=24	Female	148	106	71.6	$ 9,981	$ 7,301
<=24	Male	85	57	67.1	$10,489	$ 9,537
<=24	All	233	163	70.0	$10,159	$ 9,001
25-34	Female	68	58	85.3	$17,128	$13,058
35-34	Male	43	34	79.1	$20,446	$18,160
35-34	All	111	92	82.9	$18,354	$16,120
35+	Female	70	49	70.0	$16,917	$17,419
35+	Male	25	19	76.0	$21,253	$30,534
35+	All	95	68	71.6	$18,128	$25,128
Total	Female	286	213	74.5	$13,523	$11,148
Total	Male	153	110	71.9	$15,425	$17,558
Total	All	439	323	73.6	$14,171	$15,057

These numbers show that college completers 24 and under who work in Wyoming are earning at or above the average for their gender and age group. In the other age groups, women also are likely to earn at or above the average for their age groups. The 35 and above age group is the primary exception for females. The opposite is true for males in all age groups above 24 years.

There are several potential explanations for this pattern of disparity among the men and women who attend Casper College. First, the college has programs in

several health related fields and in the area of legal assistants that enroll over 95 percent women students and upon completion of these programs these students immediately enter their chosen field and begin making incomes at or above the average for the state. Secondly, the statistics do not exclude those students who continue their education at the University of Wyoming; the only State supported four-year college or university. Thus they will appear in the wage record data if they are working part-time while continuing their education bringing down the quarterly average earnings. The major increases in earning power for these transfer students will not be realized until they begin working full-time.

Another possible explanation is that those individuals who were in the 25-34 and the 34 and above age groups were likely to have been either unemployed or underemployed individuals prior to entering college. When they enter the job market after graduation they are likely to have a better job than before their college work but are starting as a new employee with little or no experience. Thus when they enter the job market they are making more money than previously but cannot make up the impact that longevity in the job market has on individual earning power.

The need to account for this difference necessitated a reexamination of the wage record data to attempt to determine the true effect that attending Casper College might have on a person's earning ability. This led to redefining the parameters for inclusion in the control groups taking additional variables into consideration as discussed by Bullard (1999). Therefore, in addition to gender and age the control groups were also separated by wage groups based on the average quarterly wages of the graduates for all quarters worked prior to graduation.

For example, a graduate working only four quarters prior to graduation (not necessarily consecutive quarters) earning a total wage of $4,000 for those four quarters would have an average quarterly wage of $1000 and would be placed in the appropriate wage group. The ranges of the wage groups were determined by creating five equal groups in Statistical Program for Social Sciences (SPSS). A sixth group ($6,000 and up) was added because it was determined after examination of the graduates data that less than one percent of the graduates made over $6,000 on average prior to graduation.

This action resulted in the creation of a paired/matched control group that was controlled not only for gender and age but also earning ability prior to college. Tables 10, 11, and 12 display the paired groupings for the graduates and revised control groups based on gender and age.

Table 10

Gender and Age of the Paired 1996 Graduates and Control Groups

Gender	Age	1996 Graduates	%	1996 Control	%
Female	16-19	0	0.0	0	0.0
Female	20-24	116	33.0	6572	34.2
Female	25-34	59	16.8	3092	16.1
Female	35-44	33	9.4	1546	8.1
Female	45-54	14	4.0	837	4.4
Female	55-64	1	0.3	64	0.3
Female	65+	0	0.0	0	0.0
Male	16-19	4	1.1	257	1.3
Male	20-24	75	21.4	4124	21.5
Male	25-34	33	9.4	1932	10.1
Male	35-44	8	2.3	386	2.0
Male	45-54	7	2.0	322	1.7
Male	55-64	1	0.3	64	0.3
	Totals	351	100	19196	100

Table 11

Gender and Age of the Paired 1997 Graduates and Control Group

Gender	Age	1997 Graduates	%	1997 Control	%
Female	16-19	1	0.3	56	0.4
Female	20-24	98	33.2	4648	34.3
Female	25-34	38	12.9	1512	11.2
Female	35-44	34	11.5	1400	10.3
Female	45-54	13	4.4	560	4.1
Female	55-64	2	0.7	112	0.8
Female	65+	1	0.3	56	0.4
Male	16-19	4	1.4	224	1.7
Male	20-24	73	24.7	3416	25.2
Male	25-34	24	8.1	1232	9.1
Male	35-44	6	2.0	280	2.1
Male	45-54	1	0.3	56	0.4
Male	55-64	0	0.0	0	0.0
	Totals	295	100	13552	100

Table 12

Gender and Age of the Paired 1998 Graduates and Control Groups

Gender	Age	1998 Graduates	%	1999 Control	%
Female	16-19	0	0.0	0	0.0
Female	20-24	121	33.9	7650	34.6
Female	25-34	57	16.0	3225	14.6
Female	35-44	32	9.0	1875	8.5
Female	45-54	16	4.5	600	2.7
Female	55-64	1	0.3	75	0.3
Female	65+	0	0.0	0	0.0
Male	16-19	4	1.1	300	1.4
Male	20-24	75	21.0	5175	23.4
Male	25-34	34	9.5	2475	11.2
Male	35-44	13	3.6	525	2.4
Male	45-54	4	1.1	225	1.0
Male	55-64	0	0.0	0	0.0
	Totals	357	100	22125	100

After making the adjustments that make it possible to pair the graduates with a like control group the employment wage history for both groups was ultimately tracked for up to twenty-six (26) work quarters prior to completion of college. The tracking also continued for no less than eight (8) quarters after graduation and in some instances up to sixteen (16) work quarters after graduation. This process allows for comparison of the earning power of both graduate and control groups at equal times in history for comparison of earning power.

Table 13, 14, 15, and 16 provide the comparisons for each year after revising the criteria for the control groups. It shows average earnings for the graduates and for a paired control group for several quarters before graduation from college and for several after completion of a course of study. Though students were tracked more quarters before graduation and additional quarters after graduation the -10 to +8 range was used to allow for ease in comparison between the years. Those numbers in the table with a minus (-) sign represent the number of quarters prior to graduation, while those with a plus (+) sign indicate the number of quarters of work after program completion.

Table 13

Quarterly Wages for 1996 Graduates and Control Groups Over Time

Earning periods before and after program completion	Control Group	Graduate Group
-10	$2667	$2635
- 9	$2356	$2587
- 8	$2613	$2535
- 7	$2633	$2465
- 6	$2535	$2527
- 5	$2505	$2400
- 4	$2701	$2850
- 3	$2752	$2662
- 2	$2643	$2340
- 1	$2620	$2072
0	$2945	$3322
+ 1	$3052	$3560
+ 2	$3072	$3634
+ 3	$3242	$3954
+ 4	$3292	$4431
+ 5	$3716	$4723
+ 6	$3549	$4612
+ 7	$3741	$5798
+ 8	$3913	$5206

Note. Earnings after eight quarters are significant to .000

Table 14

Quarterly Wages for 1997 Graduates and Control Groups Over Time

Earning periods before and after program completion	Control Group	Graduate Group
-10	$2583	$2401
- 9	$2524	$2409
- 8	$2700	$2574
- 7	$2819	$2393
- 6	$2738	$2254
- 5	$2667	$2258
- 4	$2917	$2952
- 3	$3000	$2335
- 2	$2877	$2332
- 1	$2907	$2291
0	$3202	$3239
+ 1	$3403	$3590
+ 2	$3336	$3730
+ 3	$3499	$3681
+ 4	$3749	$4318
+ 5	$4048	$4287
+ 6	$3776	$4377
+ 7	$4049	$4441
+ 8	$4396	$4660

Note. Earnings after eight quarters are significant to .001

Table 15

Quarterly Wages for 1998 Graduates and Control Groups Over Time

Earning periods before and after program completion	Control Group	Graduate Group
-10	$2636	$2401
- 9	$2577	$2182
- 8	$2806	$2728
- 7	$2926	$2535
- 6	$2799	$2436
- 5	$2874	$2215
- 4	$3127	$3035
- 3	$3289	$2368
- 2	$3110	$2440
- 1	$3097	$2385
0	$3432	$4094
+ 1	$3666	$4191
+ 2	$3559	$4126
+ 3	$3774	$4672
+ 4	$4070	$5239
+ 5	$4273	$6075
+ 6	$4110	$5772
+ 7	$4209	$5778
+ 8	$4371	$5938

Note. Earnings after eight quarters are significant to .000

Table 16

Quarterly Wages for All Graduates and Control Groups Over Time

Earning periods before and after program completion	Control Group	Graduate Group
-10	$2533	$2476
- 9	$2490	$2383
- 8	$2714	$2615
- 7	$2801	$2469
- 6	$2696	$2412
- 5	$2698	$2291
- 4	$2931	$2946
- 3	$3035	$2452
- 2	$2893	$2373
- 1	$2885	$2245
0	$3204	$3570
+ 1	$3384	$3807
+ 2	$3331	$3850
+ 3	$3513	$4138
+ 4	$3782	$4702
+ 5	$4017	$5101
+ 6	$3827	$4992
+ 7	$3998	$5426
+ 8	$4187	$5327

Note. Earnings after eight quarters are significant to .000

These data present an accurate picture of the impact that attending college has on the earning power of a student. During the ten quarters prior to graduation, students attending college are earning total wages very close to those earned by individuals not attending college. Immediately after graduation (zero in the tables) wages for the Casper College graduates surpass those of the control group and remain higher for each

quarter thereafter. This point is even more obvious when seen in graph form as indicated in Figures 1, 2, 3, and 4. These figures also show the data that were collected for all the extremes not provided in the previous tables

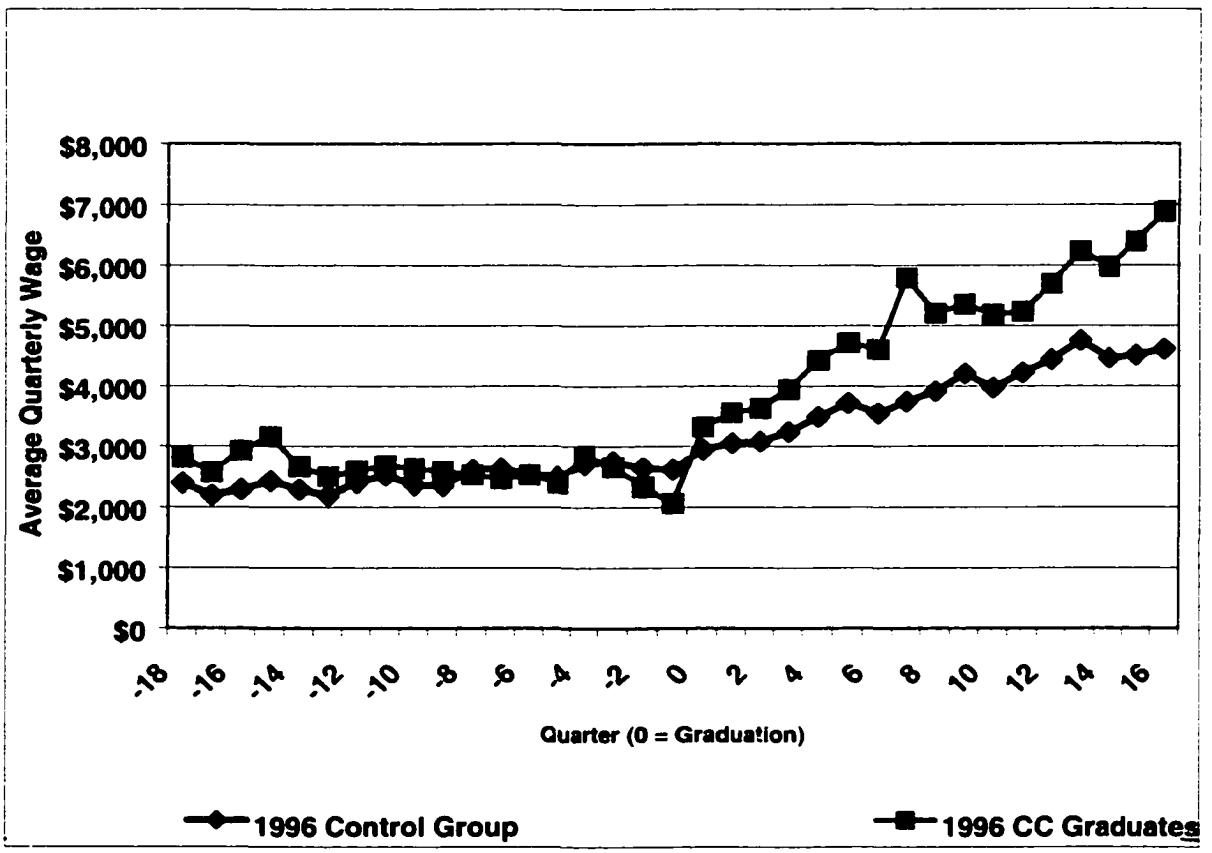

Figure 1. 1996 Casper College graduates and paired control quarterly earnings over time

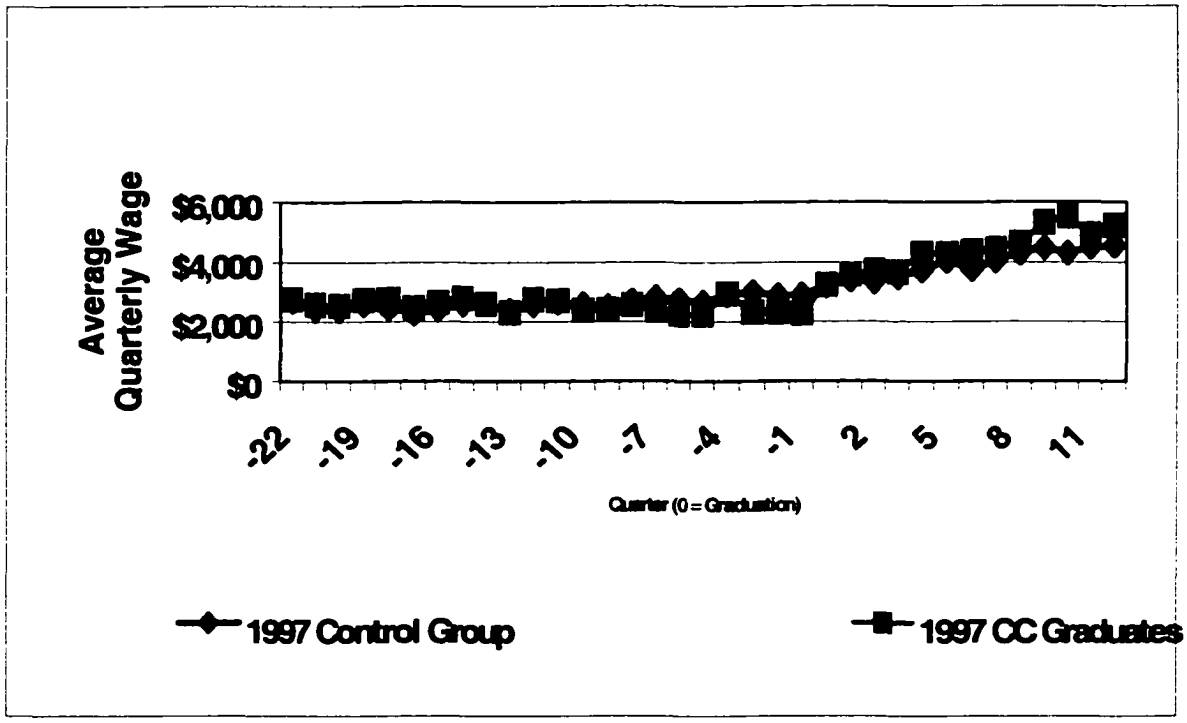

Figure 2. 1997 Casper College graduates and paired control quarterly earnings over time

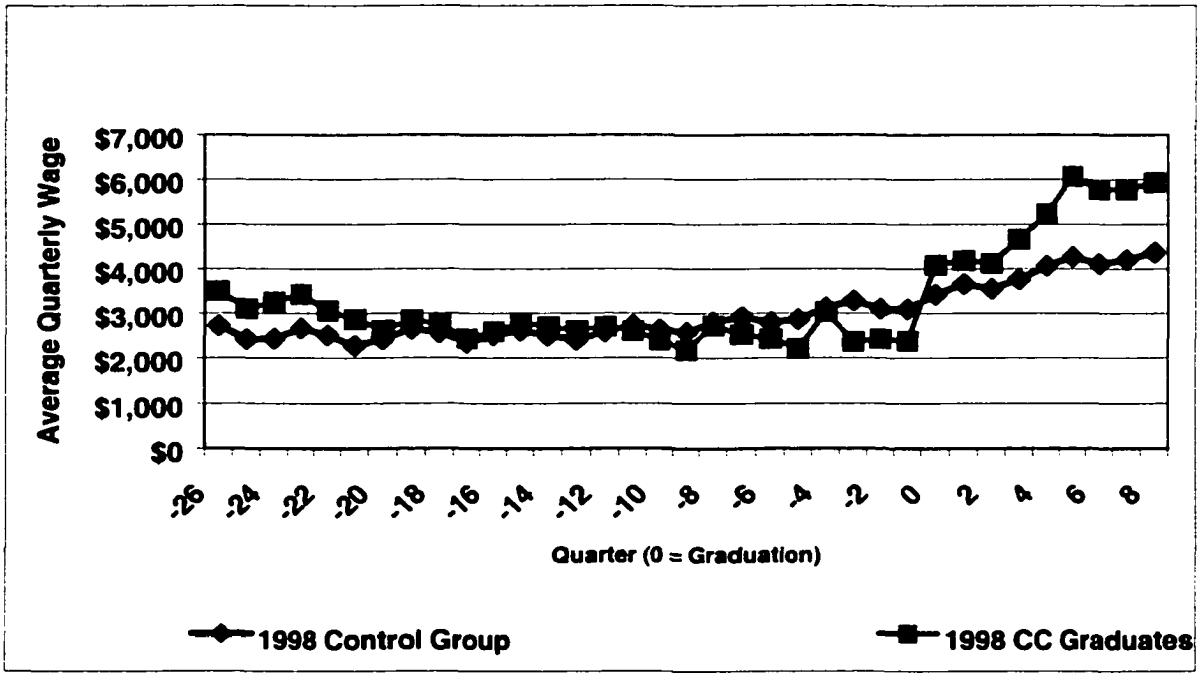

Figure 3. 1998 Casper College graduates and paired control quarterly earnings over time

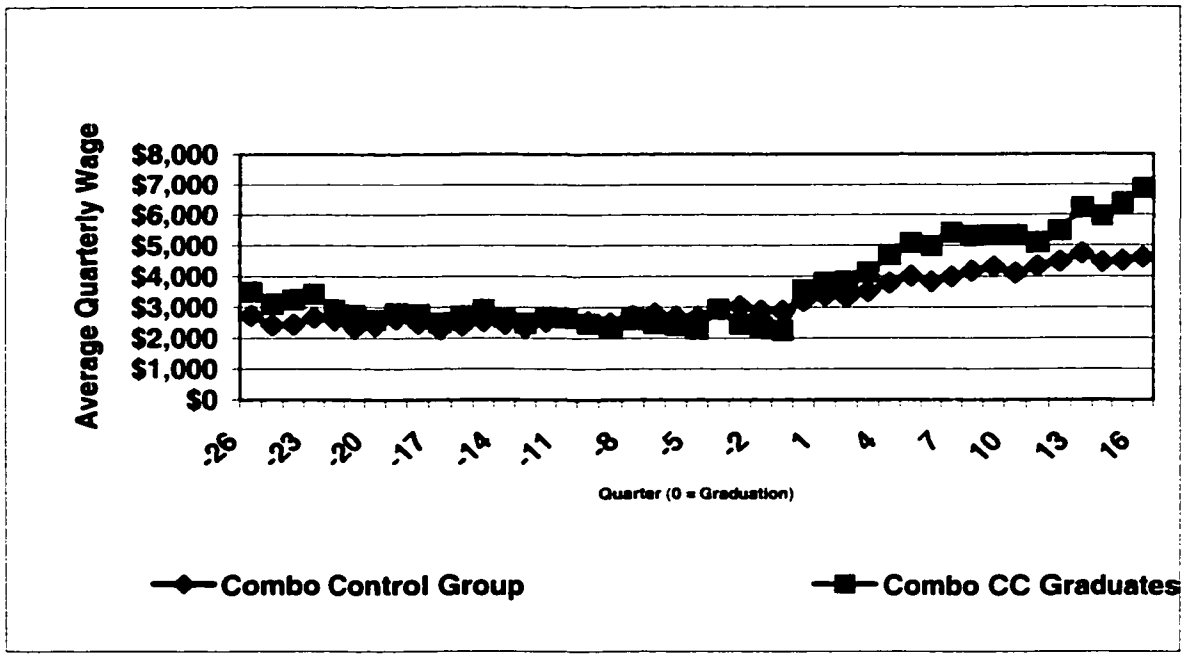

Figure 4. 1996 to 1998 Casper College graduates and paired control quarterly earnings over time

What is the impact? Two years (eight work quarters) after graduation from Casper College students who completed their studies in 1996 and entered the labor market in Wyoming showed average earnings of $39,240 or an annual average income of $19,620. It is important to point out again that these figures include students who transferred to the University of Wyoming and were working part-time. The control group for the same graduating class posted earnings of $30,522 or an annual average income of $15,261. The increase in earning power for the Casper College graduates represents an adjustment in earning power of 56.7 percent. For the control group,

the increase in earning power was only 32.9 percent. The value added to the earning power of the students graduating from Casper College in 1996 during the eight quarters after completion was $8,718. Paired sample t-tests indicate that the difference between these two groups is significant at .000.

There are between 80-100 students who transfer to the University in their junior year from Casper College each year. Again, if it had been possible to remove from the graduate data those students who transferred to the University and were simultaneously working part-time, this figure would be considerably higher.

Earnings for the graduates of the class of 1997 two years after graduation totaled $36,323 for an average annual salary of $18,161.50. The control group for this graduating class earned $33,458 during the same eight quarters for an average annual income of $16,729. The increased earning power for this Casper College graduating class represents an increase of 43.9 percent. The increase for the control group was only 37.3 percent. Though the difference between the two groups was less for the 1997 graduates than for the 1996 graduates the value of obtaining a degree can still be placed at $2865 after

just two years. The t-tests that were conducted indicated the difference to be significant at .001.

Eight quarters after graduation from Casper College the class of 1998 who entered the Wyoming job force had earned a total of $45,885 or an annual income averaging $22,942.50. The control group for that graduating class earned $35,464 for the same two-year period for an average annual wage of $17,732. The increase in earning power for the Casper College graduates represented a 45.0 percent enhancement. The control group wages increased 27.4 percent over the same period. The impact on earning power for this graduating class represents an increase of $10,421. Paired sample t-tests indicated that this difference was significant at .000.

When the three graduating classes are treated as a single cohort, they earned an average of $40,913 during the following eight work quarters for an annual average income of $20,456.50. When the control groups are also treated as a single cohort their combined earnings for the same eight quarters of work averaged $33,243 for an average annual income of $16,621.50. The increase in the income for the college graduate group represents an adjustment of 49.2 percent additional funds. For the control group the wage variance is equal to a 30.7

percent increase. The positive impact to the earning power of the college graduates averaged $7,670. This difference is significant at the .000 level as verified by two sample t-tests.

The above data clearly indicate that completing a course of study at Casper College does have a positive impact on the earning power of those who graduate. Figures 1, 2, 3, and 4 show that the impact is immediate and that it increases over time, growing to as much as $10,421 after eight quarters of work. The average for all graduating classes was shown to be $7,670 more than the control groups.

How the impacts compare with legislator perceptions. The data presented in Tables 13, 14, 15, and 16 and Figures 1, 2, 3, and 4 show that there is a clear and convincing benefit to graduating from Casper College. That benefit starts immediately after graduation and increases over time. These figures tend to serve as verification that the perceptions held by legislators who were classified in this category are accurate.

Tables 7, 8, and 9 present data that tend to support both the graduated and qualified benefit perceptions held by some of the Natrona County legislators. When compared to the entire working population, graduates 24 years of

age and less make more money than the control population. Also, women graduates tend to earn salaries closer to the average of their control groups than their male counterparts do. This seems to indicate that women are more likely to see immediate monetary rewards for completion of a course of study than their male counterparts. This is likely due to the fact that the programs of study previously mentioned are programs primarily taken by females and those programs allow completers to immediately enter the job market at wages equal to or greater that the State's average.

Data generated from wage records alone do not tend to prove or disprove legislator perceptions concerning the role that Casper College plays with job training skills. Likewise, wage record data alone do not provide any information about the relationship between the cost of attending Casper College and the ability to gain financially after graduation.

Impact on the Local and State Economy

How do the economies of Natrona County and the State of Wyoming benefit from the presence of Casper College? A question that has not publicly been asked frequently enough, and when asked has rarely been answered with more than anecdotes. It is important to understand what

people's perceptions are concerning the answer to this question, but it is equally important to gather data that can be used to either support or change those perceptions.

Legislator perceptions. For purposes of this part of the study there were several important individual perception that emerged from the interviews. Legislators were first asked to broadly discuss their thoughts about how the college generally influences the local and state economies. Table 17 indicates the six major themes that emerged from their discussions on this topic.

Table 17

Legislator Perceptions of the General Impact of Casper College on the Economies of the State of Wyoming and Natrona County

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
Enhances local economy	X	X	X	X	X		X	X	X	X		X
Job training value	X		X	X	X	X	X		X	X		X
Education value	X			X		X		X				X
Economic development	X		X		X							
Cultural enhancement		X				X						
Community enhancement	X					X					X	

There was no unified perception among the legislators about how the college interacts with the two economies. Of the six areas that could be clearly identified, ten legislators openly discussed the value of the college in enhancing the local economy. This single area was the closest to a unanimous perception. The next closest perception was that the college played a significant role in job training for the state and local areas, with nine legislators choosing to talk about this benefit. After that there was no other area that had even half of the legislators in agreement. It seemed somewhat strange that only three legislators discussed the work that the College does in support of state and local economic development efforts because there had been significant publicity on the work being done by the college with two new businesses in town.

It is important to note that the individual legislators would sometimes emphasize a particular perception multiple times and might only speak of others briefly in passing. Table 18 illustrates this fact and shows how often particular legislators repeated or emphasized individual perceptions.

Table 18

Frequency of Legislator Perceptions Concerning General Economic Impact of Casper College on the Local and State Economies

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
Enhances local economy	1	2	2	1	1		6	3	2	1		1
Job training value	1		4	3	3	1	1			1		1
Education value	1			1		1		1	1			1
Economic development	1		1		1							
Cultural enhancement		1				1						
Community enhancement	1					1					1	

As indicated in Table 18, there were twenty different comments that spoke to the belief that the college served to enhance the local economy. Specifically, this perception included such comments as:

- The actual jobs that are provided by the college itself have a definite impact because the people who work for the college hopefully spend their money in Casper. (Legislator 3)

- Anything that adds to the economy including out of state students that come in. That's brand new money that comes to the state so you've got that kind of impact that goes through the college system and also goes through the local rental markets and all of that kind of stuff. (Legislator 4)
- Casper College employs a number of employees, teachers, administrators, and peripheral workers, which is a direct impact. (Legislator 7)
- It's an institution that purchases, I would assume, an awful lot of their materials and supplies and things locally. (Legislator 8)
- Every student that we have coming to Casper College, every employee that we have working at Casper College stimulates those local expenditures which is good for our economy, good for our tax base. (Legislator 7)

The second most common perception of how the College impacts the local and state economies focused on the College's ability to provide meaningful job training opportunities for residents of the area and state. This perception was supported by such comments as:

- It also lets people stay in the community and work and add to their education so they can enhance their careers. (Legislator 1)
- Preparing a local workforce for jobs that maybe we haven't had people prepared for before. (Legislator 3)
- Some of the kids from Casper will be able to live here and have jobs because of the partnerships that are developing between the college and some of the new businesses that are looking at Casper. (Legislator 3)
- It produces our job pool in that it produces qualified workers for various jobs ranging from technical jobs right through professional jobs. (Legislator 7)
- In terms of workforce training and development, the community colleges, because they're dispersed around the state and I think have more flexibility in that area, I think that's a very important component of it and probably will become more important. (Legislator 12)

- Probably the greatest is preparing people to go out into the workforce. Some of the things that are going on now with specific training for specific businesses that are coming in that its preparing a local workforce for jobs that maybe we haven't had people prepared for before. (Legislator 3)
- The first and foremost is the better educated and better trained its residency is the better class of workmanship we are going to come up with and the more our salaries are going to increase. (Legislator 5)

Additionally, many of those interviewed expressly discussed their perceptions of how the College specifically impacts the economy of the State of Wyoming. This was an attempt to separate the two economies and to identify the difference in impacts. Table 19 identifies the major perceptions that legislators discussed in this area.

Table 19

Legislator Perceptions: How Casper College Impacts The State's Economy

Perceptions	Legislators											
	1	2	3	4	5	6	7	8	9	10	11	12
Community impact influence		X				X					X	X
Additional taxes generated		X										
Economic development asset		X							X			
Improves quality of life		X										
Mirrors local impacts		X	X									
Less than local impacts			X									
Workforce development			X		X	X	X		X			X
Assist the University			X				X					
Sets a higher education example				X								
Educates citizens					X			X				
Keeps students in state							X					X
Uncertainty								X		X		
Purchases goods and services								X				

Once again, it is clear that there was no unity of perception among the legislators as to how Casper College impacts the economy of the State. Unlike the earlier discussion, the area of workforce development was the most mentioned perception concerning the College's ability to impact the State's economy. Legislators made a variety of comments about the College's workforce development value.

- Providing a workforce for the state of Wyoming, and hopefully increasing that workforce, or at least maintaining it. (Legislator 3)
- Employers of the State of Wyoming receive a better-trained workforce at a lower or very little cost to the students themselves. (Legislator 5)
- Programs that turn out qualified workers that go to the four corners of the state. (Legislator 7)
- The community colleges work directly with those businesses to do workforce development training and things along those lines. (Legislator 9)

- If somebody is educated at Casper College and that leads to a job in the state, then obviously that is a benefit to us. (Legislator 12)

For comparison purposes it is desirable to look at the perceptions that legislators held concerning how the college interacts with the local economy. Table 20 presents those data.

Table 20

Legislator Perceptions: How Casper College Impacts the Local Economy

Perceptions	Legislators											
	1	2	3	4	5	6	7	8	9	10	11	12
Salaries impact local economy					X							
Available education							X					
Brings people to community						X			X			X
Broadens tax base						X						X
College purchases					X							
Fluff									X			
Job preparation								X		X		
Keeps jobs locally			X									
Lack of knowledge			X									X
Major local employer					X	X			X			X
Benefits of new construction					X							
Remaining in community			X									
Spending money locally			X			X						X
Technology development									X			

It is worthy of noting that perceptions pertaining to preparing a workforce were not seen as a dominant factor in the College's interactions with the local economy. Two closely related perceptions were identified however. One legislator indicated that the College tended to keep jobs locally and two legislators identified the impact that the College has in preparing people for jobs.

- It's a huge contributor to our youth as they're qualifying for their careers. (Legislator 7)
- More importantly, I think are the businesses in the community that use the services (of the college) for their people to go and get training on computers or whatever it is as though they're upgrading and learning new things. (Legislator 9)

In an attempt to get more specific about actual impact figures the issue of actual expenditures of the College was discussed. Table 21 indicates the perceptions that were offered by the legislators.

Table 21

Legislator Perceptions: College Expenditures

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
General operation				X								
Multiplier effect							X		X			
Personnel				X								
Lack of Knowledge			X	X	X	X		X	X	X	X	X
Wild guess				X	X	X	X	X	X		X	X

Of the legislators who discussed the topic of expenditures by the College none were able to offer first hand knowledge about the size of the College budget, the amount spent locally or the amount spent in the state. Eight of the nine legislators who offered discussions in this area openly admitted that they did not know about the College's spending patterns. Examples of statements given by legislators who indicate a lack of knowledge concerning college expenditures included the following:

- I really don't know...I just don't have those numbers. (Legislator 3)

- I should have looked at the crib sheet I had from when I was on the College Board. I can't even round up a number. (Legislator 4)
- I've seen the figures but I can't remember them. I wish I had checked before you came. (Legislator 5)
- I don't know. (Legislator 6)
- Gosh, I have no idea. (Legislator 8)
- The total dollars I wouldn't know. I can't remember what the budget for this institution is. (Legislator 9)
- I don't know. (Legislator 10)
- I ought to know, but I don't. (Legislator 11)
- I see the figures come by in the different information I get, but I just haven't worked with it closely enough to commit to my long-term memory. (Legislator 12)

Of those persons who guessed on the expenditures, their guesses were quite different and indicative of a general lack of knowledge on which to base those perceptions.

- It seems like there is about $20 million a year that goes to the system and Casper College gets about 20% of that amount. Tuition is about equal to that amount, and then there are fees of a couple million probably. So probably 10 million bucks would be a roundhouse number. (Legislator 4)
- I would say somewhere around $50 million dollars. (Legislator 5)
- We're talking about what? Two million-three million dollars? (Legislator 6)
- I haven't given great thought to that figure but I would guess that it's well above $10 million per year and probably less than $100 million. (Legislator 7)
- Just off the top of my head I would say somewhere near $100 million. (Legislator 8)
- About $25 million local dollars and $25 million state dollars. (Legislator 9)

Again, the legislator perceptions on expenditures are indicative of a lack of foundational knowledge about the College in general. These are the people responsible for appropriating the major portion of the institution's

operational budget. The guesses that were offered ranged from $2 million to $100 million. This degree of difference confirms the point that decision makers are not totally informed about crucial aspects of the College. The general fund budget of the College is slightly over $31 million. Of those funds, approximately $18.5 million are general expenditures and slightly more than $12.5 million is spent on salaries and benefits. To say the guesses were wide of the mark would be an understatement.

Another area of specific knowledge that legislators might possess concerning how the College interacts with the local and state economies involves the number of people that the College employs. In examining this area it was possible to identify six different perceptions expressed by Natrona County Legislators. Table 22 provides an overview of those perceptions and indicates once again that there is a definite lack of knowledge on this issue.

Table 22

Legislator Perceptions: Direct College Jobs

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
Assumptions		X										
Indirect jobs					X							
External jobs	X											
Generalizes	X						X				X	
Guesses					X		X	X	X		X	X
Lack of knowledge		X	X	X	X	X	X	X	X	X		

Examples of this lack of knowledge are born out in the following comments from legislators.

- I don't know that specifically. (Legislator 2)
- You know, I really don't know and I should know that. (Legislator 3)
- Well, without my crib sheet I can't even tell you how many faculty and staff that we have. (Legislator 4)
- Well, I have read the statistic and I can't remember it. (Legislator 5)

- I don't know. (Legislators 6 & 10)
- I've been away from Casper for so long I would not be able to hazard a guess. (Legislator 7)
- Do you want a guess? (Legislator 8)
- It would just be a wild guess. (Legislator 9)

Those legislators who chose to hazard a guess about the number of direct jobs at Casper College were as varied as those who guessed about expenditures.

- I think Casper College employs between four to five hundred people, all the way from administration staff clear on down through the custodial staff. (Legislator 5)
- I would imagine we're on the order of between 500 and 1000 employees just as a guess. (Legislator 7)
- Three or four hundred. (Legislator 8)
- My guess would be a couple hundred. (Legislator 9)
- It's a pretty good size employer. Somewhere between two and three hundred. (Legislator 11)

- I suppose all together I would guess 300 to 350. (Legislator 12)

These job "estimates" range from a low of "a couple hundred" to a high of 1000. This span of 800 jobs is again evidence of a lack of crucial information about the interaction of the College with the economy. In actuality, the College employs 661 employees. Of this number 323 are full-time and 338 are part-time. These part time employees calculate into 124 full-time equivalent jobs. This number is prorated based on a 40-hour workweek for non-teaching employees and on a 30-credit teaching year for faculty. At best, two of the legislators were close to the number of employees at Casper College.

Another category of information relating to jobs that is important to understand is the creation of indirect jobs. These are the jobs that come to a community because of the way that a major company interacts with the economy. During the interview, the legislators were very familiar with the concept of indirect jobs. Table 23 presents the legislator perceptions as they relate to indirect jobs attributable to the presence of the college.

Table 23

Legislator Perceptions: Indirect Jobs Attributable To Casper College

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
Lack of knowledge			X							X	X	X
Uncertain		X									X	
Guess		X	X				X					
Assumption		X			X			X	X			X
Rollover effect								X				

One more time the nine legislators who discussed this concept possessed a general lack of knowledge on the number of such jobs and were prone to resorting to guesses or assumptions. The following comments are indicative of the knowledge level of the delegation on this issue.

- I would guess that the secondary jobs are probably twice what the jobs are at the college. (Legislator 3)
- I would say on the order of 10,000 employees in the county. (Legislator 7)

- I would imagine it's close to the same number as the number of direct jobs. (Legislator 9)
- I'm estimating that one could multiply the number of direct jobs by 1.5 or 1.7. (Legislator 5)
- Well, that's something I don't have any indication in, or I just don't have a very good background to even hazard a guess as to what it might be. (Legislator 12)

The final topic of discussion examined the often talked about concept of "brain drain" or the out-migration of program completers to surrounding states to work. For those legislators who took a position on this issue, the discussions centered around whether there was a certain percentage of program completers whom the legislators would like to see enter the Wyoming job force after completion of their studies to make them feel the State was receiving an adequate return on its education dollar. The perceptions of the legislators on this subject were as varied as on many of the other topics discussed. Their perceptions were easily classified into eight different major categories. Table 24 presents

those categories and identifies the legislators who presented perceptions in each area.

Table 24

Legislator Perceptions: Should the State Expect Our Graduates to Work In Wyoming After Completing their Studies?

Perceptions	Legislator											
	1	2	3	4	5	6	7	8	9	10	11	12
A portion should stay				X	X		X					
There should be an ability to return	X					X						
Certain segments are leaving			X	X								
There should be freedom to move	X											
In-migration	X					X						
Prerequisite to staying in state				X	X							
Speculation			X									
Uncertainty		X										

Three legislators were of the belief that at least a portion of the students who attend public supported colleges should remain in the state after completion of

their programs of studies. Their comments are worthy of examination.

- One of the functions of government is to provide good education. And not all of that wraps around and stays in the state. If we could get 50 percent to stay in the state it would be a miraculous return on the state's investment. (Legislator 4)
- I would think that if maybe 50 percent of our graduates could stay here in Wyoming it would ultimately enhance the state's ability to compete in the national and perhaps even international market places. (Legislator 5)
- I think that 80 percent should stay in the state. If 80 percent stayed it would give us a return on our investment. (Legislator 7)

These comments are balanced by those legislators who professed that it was unfair to expect students to remain in the state if they wanted to pursue work elsewhere. Rather, it was important for the state to have good jobs for them if and when they wanted to return. In other words the state should be more concerned with developing attractive jobs that would be available for our students

after they have followed their dreams, so they could have the ability to return to Wyoming if they wanted to.

- The ideal situation is for them to experience life for four year, five years, ten years, what ever, and then have the education and other things that they've learned and come back to Wyoming. So, by having them leave here, that's fine, but if we can't get them back somehow, then that's not fine. (Legislator 1)
- Those who leave the state for work have a tendency to start looking to come back after a decade or so. (Legislator 6)

Going hand in hand with this view of the issue was the accompanying perception that even though the state is losing many of the students it invests in, there is an equally large in-migration of talented individuals that diminishes any "brain drain" that may appear to be taking place.

- I just don't think it's a fair statement to say we are losing our educated kids to other states, because we are obviously getting people in from other states who've been

educated in other institutions. (Legislator 1)

- I think that we have people coming into the state from other universities and other community colleges. It brings in new thoughts when you have people from outside coming in and our students going elsewhere. (Legislator 6)

A final perception worthy of detailing concerning the issue of "brain drain" was the belief expressed by two of the legislators that there was a definite prerequisite necessary before the state could expect the students it supports to stay in Wyoming to work.

- The reason they're not staying in large part is because of jobs. Economic development is the answer to that. Get jobs that pay well and we'll start keeping our people in Wyoming. (Legislator 4)
- What is really going to make our students stay in Wyoming is when the employer in Wyoming either has the respect for his employees or that the employer in the State is able to grow his business to the point that he can pay competitively compared to

the states surrounding us and even beyond that. (Legislator 5)

Both of these legislators placed the blame for this phenomenon on the lack of jobs in the state capable of attracting high skilled workers and the inability of current Wyoming employers to pay competitive wages in the national work arena. Their perceptions are a classic example of the philosophical debate which sought to answer the question, which came first, the chicken or the egg? They have built a true tautological construct: To keep our students in Wyoming after program completion there must be a surplus of good paying jobs. To attract a surplus of good paying jobs Wyoming must have a qualified workforce available to meet the needs of industry.

Interpretation of the perceptions. The legislator perceptions concerning the interaction with Casper College and the state and local economies appear to be other than data driven. Most of the legislators were able to discuss their perceptions in general terms, but seldom offered any hard numbers. As the discussions narrowed in attempts to hone in on specific topics like number of jobs or College expenditures legislators openly displayed a lack of knowledge. When figures were

offered, they were mere guesses. The data that were offered indicates that the people who are making decisions about the funding for the College are not familiar enough with the operation of the College to comfortably identify the degree to which the College impacts local and state economies. Rather, they were relegated to guesses that often times were literally miles apart and just as far off target.

These perceptions are an indication that the College should take time to educate its legislative delegation about the manner in which the College interacts with the local and state economies. In preparation for this education it is advisable that quantitative data be developed that will document the interaction between the College and the economies of the state and county.

Economic impact analysis model. The purpose of this portion of the study is to estimate the tangible economic impact that Casper College has on Natrona County and the State of Wyoming. The model utilized in this study is based on work done by Caffrey and Isaacs (1971) and modified by G. Jeremiah Ryan (1983, 1985). This model has been utilized by community colleges in a variety of states including New Jersey, New Mexico, New York, Kansas, and Michigan when conducting economic impact

studies. This is the same model that served as the basis for the Eastern Association of College and University Business Officers computerized model (Two-Year College Committee of EACUBO, 1988).

The model utilizes three main components for each economy to estimate the direct impact of Casper College on the county and state economies. These primary components include:

- Direct Casper College expenditures in Natrona County and Wyoming;
- Direct expenditures of Casper College employees in Natrona County and Wyoming; and
- Direct expenditures of Casper College students in Natrona County and Wyoming.

In addition to the direct economic impact of the above expenditures, the model relies on the use of a multiplier to estimate the indirect economic impact resulting from the additional business volume impacts generated by the direct expenditures. Regional multiplier tables have been developed for various industries and are available through the Bureau of Economic Analysis (1997). Additionally, the model also allows for the calculation of the employment impacts attributable to the economic activity generated by the

college. The model as conceptualized is visually depicted in Figure 5.

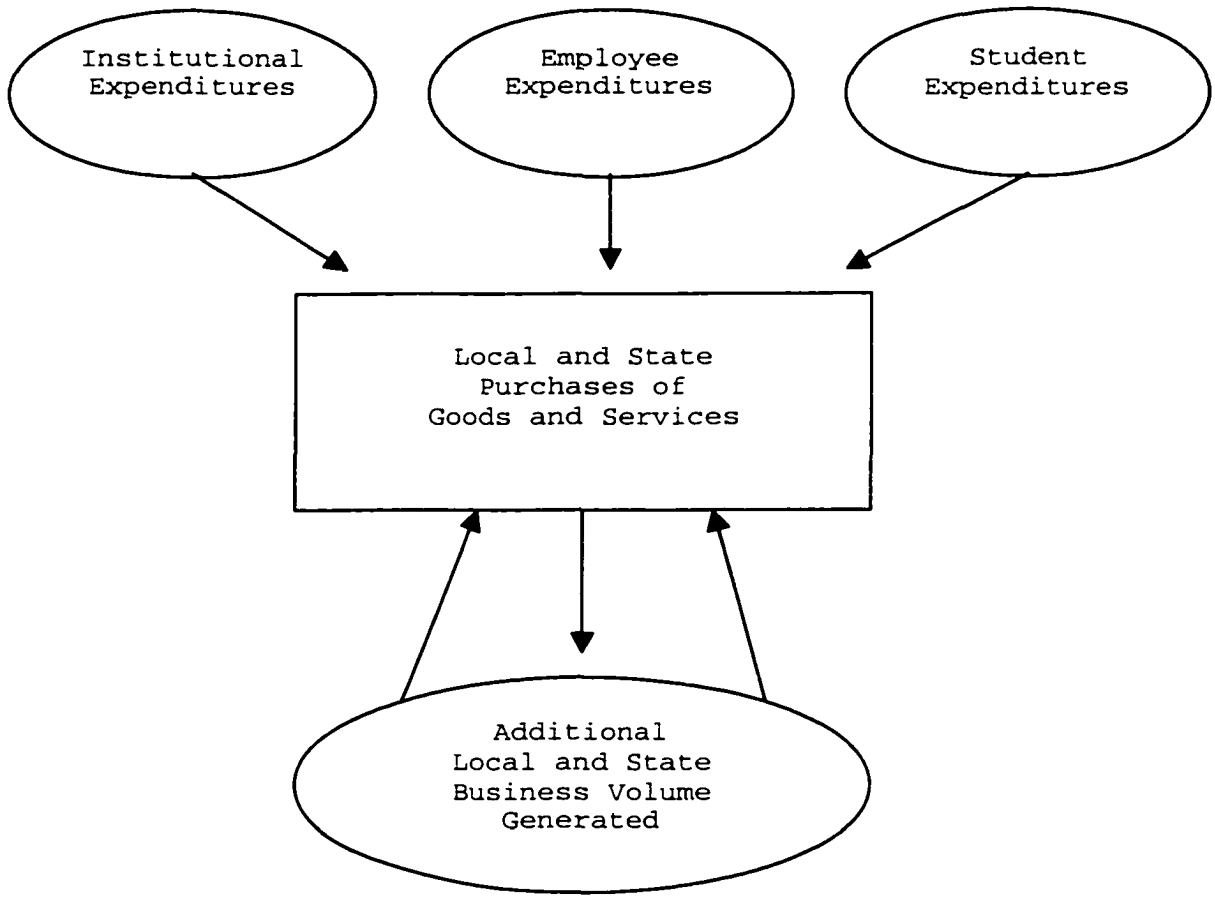

Figure 5. Caffrey and Isaacs Economic Impact Model as modified by G. J. Ryan

This particular economic analysis model was designed to provide conservative estimates. It generates data on only four major components of an institution's actual impact on an economy. There are many other components

that other models include in their calculations such as the expansion of the credit base for local banks', increased sales and property taxes generated, and investment in local property to name but a few. Nor does this analysis take into consideration the economic impact on the local and state economies from the Casper College Foundation, the Upper Division Center, Follett Bookstore, or Sodexho Marriott Food Services, all of which are located on the Casper College campus and have significant interaction with both economies. Finally, in continuation of this cautious approach, when alternative data choices were possible, the most conservative of the numbers was selected.

By taking this conservative approach the information that ultimately will be available for legislators and other interested citizens will be valid and usable. The conservative approach will make it difficult for skeptics to attack the size of the impact as being overstated. This approach will make it more likely that legislators will utilize the data because of its reliability and will understand that the actual impact is much larger than the numbers indicate.

Data elements. Based on the data generated through application of the model Casper College has a significant

impact on the economies of Natrona County and the State of Wyoming as born out by a close examination of each of the twenty-one (21) variables that comprise the model.

Data provided for Natrona County are specific to that county while the data for Wyoming include those figures outlined for Natrona County because the County is a significant part of the State of Wyoming. It should be remembered that these figures are from the 1999-2000 fiscal year.

1. Total College expenditures for the survey year were $18,486,648.00. This figure is taken from the end of year 2000 audit. It excludes salaries, internal items and transfers and taxes but includes student activity expenditures.
2. The percentage of College expenditures spent in Natrona County was 74.8 percent and the percentage spent in Wyoming was 87.2 percent. These figures were taken from the actual 1999-2000 general fund budget for purchases from Natrona County based vendors and from vendors located outside of Natrona County but in Wyoming.

3. The number of College employees working full-time is 323 and part-time is 338. These figures calculate into 447 full-time equivalent employees. The full-time and part-time numbers are taken directly from 1999-2000 payroll records. The number of full-time equivalent employees is obtained through a three-step process. First, the average, total weekly person hours worked by part-time, non-teaching employees is determined from payroll records and divided by 40. Next, the total yearly credit hours taught by part-time faculty is determined from payroll records and divided by 30. Finally the above two numbers are added to the number of full-time employees resulting in the number of full-time equivalent employees working at the College for 1999-2000.
4. The number of College employees living in Natrona County is 655 and the number living in Wyoming is 660. These numbers are taken from payroll records and from College directory information.

5. The disposable income available to College employees living in Natrona County is $10,935,721.00 and for the State is $11,078,248.00. These figures represent compensation paid directly to employees and does not include any taxes or mandatory deductions.
6. The number of full-time students at Casper College is 2509 while the number of part-timers is 1852. These numbers are taken from the Wyoming Community College Commission Enrollment Report for the 1999-2000 academic year.
7. The average annual College related student expenditures for full-time students is $6,225.00 and for part-time students is $2,810.00. These estimates of expenditures were taken from financial aid data and include living allowances, and book costs for a single dependent full-time student. Expenditures for part-time students were based on nine-month costs only for books, college related supplies and transportation. Additional living allowances are not

included because it is assumed these people would likely be living in the community/state even if they were not attending college.

8. College expenditures spent in Natrona County totaled $13,822,521.00 and the total spent in Wyoming was $16,116,631.00. These figures are calculated by applying the percentage figures identified in number 2 above to the total expenditures outlined in number 1.

9. The disposable income of the employees living in Natrona County spent in Natrona County is $5,938,097.00 and the portion spent in Wyoming is $7,045,766.00. These figures are obtained by multiplying the disposable income outlined in number 5 by the percentage of employees identified in number 4. The resulting number is multiplied by the sales to income factors for Natrona County and Wyoming (.543 & .636 respectively) provided in Sales and Marketing Management, Vol. 15, 151, #9.

10. Expenditures of out-of-county employees spent on non-housing items in Natrona County are estimated at $5,000.00. For expenditures in Natrona County the figure is calculated q by multiplying the number of employees living outside Natrona County by $1,000.00. This conservative calculation is the standard estimate recommended by Ryan (1983) and is used here even though the group of employees living outside Natrona County likely spend considerably more than this amount in Natrona County because of Wyoming geography.

11. The rental expenditures by full-time employees living in Natrona County are estimated at $918,612.00. Figures identifying the average cost of rent in Natrona County and the percentage of households that rent were obtained from the City of Casper. To calculate the amount identified above the number of full-time employees identified in number 3 is multiplied by the rental rate for the County (.34). This number is than multiplied by

the average annual rent in Natrona County ($475.00 X 12).

12. The total employee expenditures in Natrona County are $6,861,709.00 and in Wyoming the number increases to $7,969,378.00. These figures are calculated by adding together the disposable income of in-county employees spent in Natrona County (number 9), the expenditures of out-of-county employees spent on non-housing items in the County (number 10), and the rental expenditures identified in number 11.

13. The total expenditures by full-time students are $15,618,525.00 and those by part-time students are $5,204,120.00, for a total of $20,822,645.00. This total is obtained by multiplying the number of each type of student (number 6) by the average annual college related student expenditures for each student type (number 7).

14. The total initial economic impact of Casper College on the economy of Natrona County is $41,506,875.00, while the impact on the State's economy is $44,908,654.00.

These totals are obtained by summing the college expenditures (number 8), the total employee expenditures (number 12) and the total expenditures by students (number 13) for both the County and State.

15. The multiplier that will be utilized is identified. For purposes of this study the same multiplier (2.0) initially utilized in the Caffrey and Isaacs (1971) model and kept in the Ryan (1983) modifications was selected. This is more conservative than the multipliers utilized by the City of Casper and the Casper Area Economic Development Alliance (4.6) for impact studies that they conduct.

16. The multiplier is utilized to identify the total estimated economic impact for both the County and the State. It is determined by multiplying the total initial economic impacts (number 14) by the multiplier (number 15). This calculation establishes the total estimate for Natrona County at $83,013,750.00, while that for the State is $89,817,308.00.

17. The number of full time equivalent employees living in Natrona County is 442. That same number living in the State is 446. These numbers are determined by applying the full-time equivalent numbers developed in number 3 and documenting their place of residence as outlined in number 4.

18. The indirect jobs attributable to Casper College in Natrona county are 2490 and in the State are 2695. These numbers are obtained by multiplying the total initial economic impact of the college (number 14) by the external employment multiplier selected for the study (.00006). This multiplier was selected because it was more conservative than the multiplier utilized by both Ryan (.00007) and the Casper Area Economic Development Alliance (.00016). This continues the conservative approach taken throughout the study.

19. The total full time employment related to Casper College in Natrona County is 2932 and in Wyoming is 3144. These numbers are obtained by summing the full-time equivalent

employees in the State and County (number 17) and the indirect jobs created by the college (number 18).

20. The total taxpayer investment in Casper College from Natrona County is $2,593,085.00. The same figure from the State is $11,134,247.00. These numbers are obtained from the 1999-2000 College audit.

21. The return on taxpayer investment is calculated by dividing the total estimated economic impact for both the County and State (number 16) by the total taxpayer investment for both the County and State. This calculation reveals that for every $1.00 that Natrona County provides to the college through the mill levy there is a return of $32.01. Additionally, for every $1 that the legislature provides to Casper College through its general appropriations, $8.07 is returned into the state's economy.

The direct tangible economic impact of Casper College on the economy of Natrona County was significant ($41,506,875.00). It was based on expenditures within Natrona County by the College (33.3 percent), its

employees (16.5 percent), and its students (50.2 percent). The rollover of these dollars in the economy conservatively results in a secondary financial impact to Natrona County of an additional $41,506,875.00.

To obtain this investment the taxpayers of Natrona County were assessed five (5) mills of property tax annually, amounting to $2,593,085.00 for the budget year being examined. This represents a return to the county of $32.01 for each dollar that was provided to the college.

In addition to its 655 primary jobs, Casper College accounts for 2,490 secondary jobs. As a result of these interactions of the College, its employees and students with the county's economy additional jobs are created to meet those demands for goods and services. Caffrey and Isaacs (1971) suggested an employment factor of between .00007 and .00009 multiplied by the direct expenditures to estimate the number of jobs created by college related expenditures. To continue the conservative nature of this study the figure chosen was .00006, which was more in line with those suggested by the Bureau of Economic Analysis (1997). It should be noted that this model does not attempt to identify a monetary value associated with the indirect jobs, but common sense would suggest that a

figure could be obtained by multiplying the number of jobs by the average wage for the State/County, because the indirect jobs will be dispersed across the employment spectrum for the area. Casper College is responsible for an additional 2695 jobs in the Wyoming economy. The average salary during 2000 in the State as reported by the Wyoming Department of Employment (2001) is $24,950. Therefore, an additional $67,240,250.00 in the Wyoming economy is attributable to the College.

The direct interaction of the College with the State's economy is also significant ($44,908,654.00). Like that with the County, it is based on expenditures by the college (35.9 percent), its employees (17.7 percent), and its students (46.4 percent) in the State. The recycling of these dollars in the economy conservatively results in additional financial impact to the economy of the state of an additional $44,908,654.00.

To reap the benefits associated with these impacts on the economy the Wyoming State Legislature provided an appropriation amounting to $11,134,247.00 for the budget year under examination. This represents a return to the State of $8.07 for each dollar that was provided to the college.

The impact on the job market for the state of Wyoming is again major. The college has 660 employees who live within the state's boundaries. Spending within the State of Wyoming that can be associated with the College accounts for indirect jobs that total 2695. In addition to being a major employer it accounts for a significant number of secondary jobs in Wyoming.

How the model data compare with legislator perceptions. The data derived from the model indicates that Casper College impacts the local and state economies in a positive way. The College is a major employer in the county and state, hiring 660 people who live in Wyoming. Additionally, the College purchases most of its goods and services ($18,486,648.00) in Natrona County (74.8 percent) and Wyoming (87.2 percent).

Most of the legislators interviewed indicated that they felt the College was a major employer but none were close in their guesses/estimates concerning the actual number of employees. They ranged from a low of a couple hundred to a high of one thousand employees. Likewise, a thorough understanding of how the College interacts with the economy in the area of indirect jobs was not clearly understood. Of those legislators who attempted to provide a number of jobs in this category the range was

from 1.5 times the number of direct jobs (990 jobs) to a high of 10,000 additional secondary jobs.

Additionally, they were not able to identify a dollar amount that the College might circulate in the economy, either directly or indirectly, but they indicated that the College had direct expenditures somewhere between $2,000,000.00 and $100,000,000.00.

In discussing the impact that students bring to the economies, none of the legislators specifically talked about specific numbers of dollars. They did, however, indicate that students were important to the economy because they spent money that otherwise would not be in the economy.

The legislator discussions that centered around the concept of "brain drain" are not measurable by the economic impact analysis model. However, information was obtained through the use of wage record data that showed that approximately 70 percent of Casper College completers enter the Wyoming labor pool. This number would be above the 50 percent level that two legislators saw as necessary for the state to obtain an adequate return on its investment of training workers for the state. However, it is less than the desired 80 percent level that one legislator saw as desirable.

It appears that the legislators have a basic understanding of how businesses interact with the economy in general but are lacking the specifics of how the college in their legislative district actually impacts either the state or local economy. They were more comfortable in talking about the intangibles of the value of education from improving the likelihood of obtaining a job or advancing in a current job then the actual economics of the issue. This lack of comfort should be addressed by the College in ways that will ensure the members of the Natrona County legislative delegation become more familiar with the value of the College as a major contributor to the local and state economies.

Summary

This section of the study reported the results of the three different sources of data developed to determine the interaction of Casper College with the identified economies. Each of the data elements provided overwhelming evidence of the positive impact that Casper College has on the economies in question. The data developed by each of the three elements warrant a brief summarization here.

Legislator perceptions. Each of the twelve legislators interviewed freely discussed their

perceptions of how Casper College impacts Natrona County, the State of Wyoming, and the earning ability of its graduates. Their responses were general in nature and were not founded on anything by a willingness to believe in the value of higher education. None of the legislators had any quantitative evidence to offer in support of the perceptions that were offered. Unanimously, the group indicated beliefs that the College has a positive impact on all three economies.

Business volume and employment impacts. This data was obtained through implementation of an economic impact analysis model. Data were developed that document direct expenditures by the College, its employees, and students. The results indicated that the College has a major impact on the economies of both Natrona County and the State of Wyoming. The ratio of taxpayer support to economy indicates that Natrona County has a return of $32.01 for each dollar of taxes provided to the College. The ratio for the State of Wyoming is not as dramatic but still significant ($1.00 to $8.07). These figures indicate that the College provides more than 2500 indirect jobs for the Wyoming economy.

Wage record data. The data that was revealed by melding Casper College graduation records with State of

Wyoming wage records clearly documents that completion of a Casper College program of study has a positive impact on graduates' earning power. The earnings of College completers were documented both before and after graduation. A paired control group was utilized to show the impact on earning ability attributable to program completion. In each of the three years tracked the graduates made significantly more money than members of the paired control groups.

CHAPTER 5

DISCUSSION

Introduction

There were four primary purposes for conducting this study. The first was to qualitatively document the perceptions of the Natrona County delegation to the Wyoming State Legislature concerning the interaction of Casper College with three specific economies:

- The impact that completion of a Casper College program of study has on the earning ability of those completers;
- The impact that Casper College has on the local economy of Natrona County; and
- The impact that Casper College has on the economy of the State of Wyoming.

The second purpose of the study was to quantitatively document the interactions of Casper College with the same three economies. The third purpose was to compare the qualitative perceptions of the legislators to the quantitative data to determine how consistent the sources were. Finally, it would be determined whether there was

an adequate return on the investment that students and taxpayers make to Casper College.

Data Development

The method chosen to develop the perception data centered on the utilization of in-depth personal interviews with each of the twelve members of the Natrona County State Legislative Delegation. The interviews were conducted after the election of 2000 and prior to the start of the legislative session in January 2001, with one exception. Each interview was tape recorded, transcribed and then checked for accuracy. The analysis of the data proceeded as discussed by Creswell (1994 & 1998) for phenomenological data analysis. This method was selected because the purpose of the interviews was to understand the essence of the legislators' experiences/perceptions about the manner in which the college impacts various economies. Each of the transcriptions was subsequently subjected to the process of reduction (the analysis of specific statements and themes in a search for possible meanings). Ultimately, HyperRESEARCH was utilized in coding the transcripts to further assist in revealing the patterns that were present indicating the essence of the experiences/perceptions.

Quantitative data concerning the effect that completion of a program of study at Casper College has on future earning power was developed through collaboration with the Wyoming Department of Employment. The college records of program completers for 1996, 1997, and 1998 were merged with Wyoming wage records to determine the number of students who were working in Wyoming after completion of a course of study at Casper College. Additionally those records revealed average wages per work quarter for not only the college completers but also for a stratified, random control group. Students were tracked in the work world prior to finishing their studies and after program completion. The earning power of the college completers was compared to the control group to reveal the impact of program completion on earning power.

Quantitative data concerning the overall impact that Casper College has on the economies of Natrona County and the State of Wyoming were developed using a modified economic analysis model first developed by Caffrey and Isaacs (1971) and subsequently modified by Ryan (1983). This model has been used extensively by community colleges across the country when determining the economic impact of their respective institutions. This model is

conservative in its approach and measures only the direct impacts created by the expenditures of the college, its employees and students in the local and state economies. Through the use of approved multipliers it also provides a measurement that accounts for rollover of direct expenditures in an economy. It also provides a conservative estimate of secondary/indirect jobs created by the total economic impact that is attributable to the college.

Application of the Data to the Research Questions

At the conclusion of the study the data that were developed made it possible to answer each of the research questions identified in Chapter 1. The ability to compare the qualitative and quantitative data is only possible through qualitative methods. It is not possible to conduct any of the standard tests associated with quantitative data to verify those conclusions, but the essence of the perceptions were very clear and consistent across the legislative delegation.

Question 1: As measured by the economic impact analysis model, does Casper College impact the state's economy equal to or greater than the legislative appropriation for the college? The data revealed through application of the economic analysis model indicate that

Casper College spends $16,116,631.00 within the state's borders. Its employees spend another $7,969,378.00, while its students have school related expenditures amounting to $20,822.645.00. These figures combine for a total initial economic impact by Casper College on the state's economy of $44,908,654.00. Indirect expenditures are calculated with a multiplier of 2.0 and bring the total estimated economic impact on Wyoming's economy at $89,817,308.00. This compares to a legislative appropriation for the year of $11,134,247.00. This means that for every one dollar of state support provided to Casper College the state gets a return of slightly over eight dollars into the economy. Additionally, the existence of Casper College accounts for 2695 indirect jobs in Wyoming that will provide salaries totaling $67,240,250.00 annually.

Question 2: As measured by legislator perception, does Casper College impact the state's economy equal to or greater than the legislative appropriation for the college? Each of the members of the Natrona County legislative delegation spoke freely in broad, general terms concerning the ways in which the college interacts with the state economy. These economic interactions included: generating additional taxes; assisting with

economic development attempts; engaging in workforce development; assisting the University of Wyoming; keeping students in the state; and purchasing goods and services. Each of the legislators was able to anecdotally indicate that they believed the state received an adequate return on its investment in the college. However, none were able to offer any quantitative support for their perceptions. None of the legislators was capable of providing any quantifiable discussion concerning college expenditures, number of direct jobs, number of indirect jobs or the amount of state appropriation provided to the college. When pressed, some did offer guesses.

Question 3: Is there a difference between the economic impact of Casper College on the state as measured by the economic impact model compared to the legislator perception method? The legislator perception data tends to be lacking a basis for support. Each legislator reports a belief that the return to the state on its investment in Casper College is positive, but no actual dollar amount was ever discussed. Consequently, there is no adequate way to compare this belief to the actual amounts generated by the economic analysis impact model other than to acknowledge that both indicated a positive impact on the state's economy. One legislator

did indicate that the state received less of a return on its investment than Natrona County received (a fact that the model data confirms).

Question 4: As measured by the economic impact analysis model, does Casper College impact the county's economy equal to or greater than the total county tax levy for the college? The data revealed through application of the economic analysis model indicate that Casper College spends $13,822,521.00 within Natrona County. Its employees add another $6,861,709.00, while its students have school related expenditures amounting to $20,822.645.00. These figures combine for a total initial economic impact by Casper College on the county's economy of $41,506,875.00. Indirect expenditures are again calculated with a multiplier of 2.0 and bring the total estimated economic impact on Natrona County's economy at $83,013,750.00. This compares to yearly revenue coming to the college from county sources of $2,593,085.00. This means that for every one dollar of county support provided to Casper College over thirty-two dollars are returned back into the economy. In addition, the presence of Casper College in Natrona County accounts for indirect jobs in the immediate area of 2490.

Question 5: As measured by legislator perceptions, does Casper College impact the county's economy equal to or greater than the total county tax levy for the college? Once again, each of the members of the Natrona County legislative delegation spoke freely in broad, general terms concerning the ways in which the college interacts with the county's economy. These economic interactions included: the impact of the salaries on the local community; bringing people to the community; broadening the tax base; the purchases that the college makes in the local area; preparing people for jobs; keeping jobs locally; being a major local employer; the impacts of campus construction; and spending money in the local economy. None of the legislators was capable of providing any quantifiable discussion concerning college expenditures, number of direct jobs, number of indirect jobs or the amount of tax dollars provided to the college. Each of the legislators was able to anecdotally indicate a belief that Natrona County received an adequate return on its investment in the college.

Question 6: Is there a difference between the economic impact of Casper College on the county's economy as measured by the impact analysis model compared to the legislative perception method? One more time, the

perception data tends to be lacking a basis for support. Each legislator reports a belief that the return to the county on its investment in Casper College is positive, but no actual dollar amount was ever discussed other than guesses. Consequently, there is no adequate way to compare this belief to the actual amounts generated by the economic analysis impact model other than to say they both indicate a positive impact on the county's economy.

Question 7: As measured by Wyoming wage records data, is there an impact on earning power for Casper College students equal to or greater than their tuition costs for attending college? Students who completed a course of study at Casper College in 1996, 1997, and 1998 consistently showed greater earnings than their counterparts in the stratified random sample control groups. Two years after completing their studies the test group averaged earnings that were $7,670.00 more than members of the controlled group. Assuming that each person paid tuition and fees for each credit hour of a program of study, the maximum tuition costs would not have exceed $3,200.00 ($50 per credit hour for a maximum of 64 credit hours) per student. The difference between tuition costs and expanded earnings is $4,470.00 after two years. For those individuals who received a

certificate instead of a degree tuition would be paid for only 32 credits instead of 64. In those instances the expanded earnings would be $6,070.00 after the same two-year period.

The manner in which the control group was established (stratified for age, gender, and earning power prior to college) indicates that the concept of forgone wages is not a factor because it is accounted for in the collection of the data. Therefore, the return on investment for completing a course of study at Casper College is at least $4,470.00 after just two years. This figure does not include any income that a student could have earned from investing the cost of attendance, but this would likely be a small amount.

Question 8: As measured by legislator perception, is there an impact on earning power for Casper College students equal to or greater than their tuition costs for attending college? Members of the legislative delegation were able to identify three primary classifications of benefits that accrue to persons who complete programs of study at Casper College. Some of the legislators were not hesitant in acknowledging that there was a definite benefit. Others indicated that there was a benefit but it was likely influenced by variables such as program and

length of study. Still others spoke of a benefit only being recognized by some of the students and not necessarily an equal benefit to all. Four of the legislators indicated that it was very likely that students would obtain a positive return on their investment because the cost of their education was minimal and they obviously would have enhanced earnings to the degree they would cover these minimal costs.

Question 9: Is there a difference between the impact on earning power of Casper College students as measured by wage record data compared to the legislator perception method? Though the legislative delegation did not offer specific figures concerning the impact on earning power of completing a course of study they all perceived some degree of return. The data obtained from wage records tends to show a greater return than any of the legislators indicated. However, tables 11, 12, 13, 14, 15, and 16 along with figures 1, 2, 3,and 4 can be utilized to verify each of the legislative perceptions.

Conclusions

Based on the qualitative and quantitative data developed and presented in this study it is possible to draw certain conclusions.

1. The perceptions that are held by members of

the Natrona County delegation concerning the degree to which the college impacts the state and local economies are based more on a desire to believe than on solid evidence.

2. Likewise, the perceptions that are held by the legislators concerning the impact that the college has on individual earning ability are also based more on feelings than facts.
3. The data generated by the conservative economic impact analysis model provide evidence that clearly indicates the value of Casper College to both the Wyoming and Natrona County economies.
4. Likewise, the model clearly indicates that Casper College is a major source of secondary jobs for both the county and state.
5. The data generated from Wyoming wage records provides direct evidence confirming the fact that completion of a course of study at Casper College has a positive impact on the earning power of its program completers.

Recommendations

It must be realized that though the qualitative data developed during this study tends to validate the quantitative perceptions of the legislators, the basis for those beliefs was not built on a foundation of this type of hard evidence. This is substantiated by the obvious lack of knowledge that permeated the various legislator interviews.

Because of this rampant lack of knowledge which resulted in a willingness to rely on assumptions and guesses instead of documented facts, it is recommended that a process of legislator education be undertaken by members of the college to increase the knowledge base of the legislators about the true value of the college to the individuals who attend its classes as well as to the economy of the county and state. This attempt to increase the knowledge base of the legislators on this topic could prove beneficial to Casper College if difficult funding decisions must be made in future legislative sessions.

Implications for Further Research

Since the inception of this study the Association of Community College Trustees has commissioned the development of a new model to estimate the impact that

community colleges have on the economies of their service areas (Lazarick, 2001). This model calculates economic impact by developing data that indicates higher earnings per year, medical savings per year, crime savings per year, welfare savings per year and unemployment savings per year (Christophersen & Robison, 2001). This new model should be combined with the Ryan (1983) revision of the Caffrey and Isaacs (1971) model to expand the impact figures that were developed for Casper College. This addition would begin to quantify those aspects of higher education that here-to-before have been difficult to measure.

Additionally, the work that was done in this study should be replicated for each of the other six community colleges in Wyoming. The results of these additional studies would provide a clearer picture of the actual impact that the community college system has on the Wyoming economy.

That portion of this study utilizing wage record data to determine the impact of program completion on student earning power should be continued to document additional years of work. This continuation would clarify whether the increase in earnings diminishes over time.

SELECTED REFERENCES

Andrew, L. D. & Wellsfry, N. L. (1977). Community college system pays its way. Community and Junior College Journal, 47

Andrews, W., & Lillibridge, F. (1990). El Paso Community College economic impact study. El Paso, TX: El Paso Community College. (ERIC Document Reproduction service No. ED322979)

Beckmann, D. W. (1996). Estimating the economic impact of Colorado vocational education programs (Doctoral dissertation, Colorado State University, 1996). Dissertation Abstracts International, 57, 2989.

Bess, R. L. (1980). The estimated economic impact of selected community colleges (Doctoral dissertation, Illinois State University, 1980). Dissertation Abstracts International, 41, 1910.

Brann, H. I., & Baldwin, A. (1997). The economic impact of Miami-Dade Community College on the local Dade County economy. Miami, FL: Miami-Dade Community College. (ERIC Document Reproduction Service No. ED422997)

Brewer, G. (Ed.). (1999). Survey of buying power: (1999 Edition). Sales and Marketing Management, 151(9).

Brookdale Community College (1983). Handbook for conducting a study of the economic impact of a community college. Trenton, NJ: Brookdale Community College. (ERIC Document Reproduction Service No. ED233755)

Bullard, D. (1999). Estimating wage differentials for the western region. (On-line) Wyoming Department of Employment, Research and Development: wysiwyg://5/http://lmi.state.wy.us/0299/al.htn

Bureau of Economic Analysis (1997). Regional multipliers: A handbook for the regional input-output modeling System. Washington, DC: U.S. Government Printing Office.

Caffrey, J., & Isaacs, H. (1971). Estimating the impact of a college or university on the local economy. Washington, DC: American Council on Education.

Caswell, J. (1988). A study to determine desirable strategies for legislative advocacy. Dallas, TX: Dallas County Community College District. (ERIC Document Reproduction Service No. ED301231)

Christophersen, K. A. & Robison, M. H. (2001). The socio-economic benefits generated by AnyCounty Community College. (On-line)CC Benefits, Inc.: http://www.ccbenefits.com

City Manager's Office (2001). Casper demographical information (On-line). http://www.cityofcasperwy.com

Creswell, J. W. (1994). Research design: Qualitative & quantitative approaches. Thousand Oaks, CA: Sage.

Creswell, J. W. (1998). Qualitative inquiry and research design: Choosing among five traditions. Thousand Oaks, CA: Sage.

Dean, S. (1991). Making an impact. Currents, 17, 27-33.

Elliott, D. S., Levine, S.L., & Meisel, J. B. (1988). Measuring the economic impact of institutions of higher education. Research in Higher Education, 28, 17-33.

Garms, W. I. (1977). Financing Community Colleges. New York, NY: Teachers College Press.

Gray, K. C. & Herr, E. (1998). Workforce Education. Needham Heights, MA: Allen & Bacon.

Gritz, R. F. (1983). A model for measuring the economic impacts of a public rural community college on the local economy. Unpublished doctoral dissertation, University of Northern Colorado, Greeley, Colorado.

Grosset, J., Hawk, T. Irwin, B. & Obitz, W. (1995). Economic impact characteristics of the Community College of Philadelphia. Institutional research report no. 87. Philadelphia, PA: Philadelphia Community College. (ERIC Document Reproduction Service No. ED411932)

Grubb, W. N. (1996). Working in the middle. San Francisco, CA: Jossey-Bass Inc.

Honeyman, D. S., Wattenbarger, J. L. & Westbrook, K. C. (1996). Struggle to Survive. Thousand Oaks, CA: Corwin Press.

Johnson County Community College. (1995). The economic impact of Johnson County Community College on Johnson County, 1993-94. Overland Park, KS: Johnson County Community College. (ERIC Document Reproduction Service No. 405057)

Johnson, T. M. (1994). Estimating the economic impact of a college or university on a nonlocal economy (Doctoral dissertation, Texas Tech University, 1994). Dissertation Abstracts International, 56, 0109.

Kaltenbach, J. C. (1979). An extension of economic impact techniques to the public community college. Unpublished doctoral dissertqation, Saint Louis University, St. Louis, MO.

Kinnick, M. K. (1982). Oregon community college economic impact study: A guidebook. Gresham, OR: Mount Hood Community College. (ERIC Document Reproduction Service No. ED222233)

Kiser, C. (1988). The economic role of Central Community College. Grand Island, NE: Central Community College. (ERIC Document Reproduction Service No. ED30257)

Lazarick, L. (2001). A measure of success: ACCT unveils new economic model that puts solid numbers on the value of community colleges. Trustee Quarterly Winter. 10-14.

Lillibridge, F. (1995). Using a simple economic impact model to document value to policy makers. Paper presented at the Annual Forum of the Association for Institutional Research, Boston, MA

Leslie, L. L., & Brinkman, P. T. (1988). The economic value of higher education. Washington, DC: American Council on Education.

Lorenzo, A. L. (1994). The mission and functions of the community college: An overview. In G. A. Baker III (Ed.), A handbook on the community college In America (pp.111-122). Westport, CN: Greenwood Press.

Macy & McKee, LLC (August 2000). Casper Community College District financial statements and independent auditor's report (For the year ending June 30, 2000 and 1999).

Mundhenk, R. T. (2000). Institutional effectiveness and unemployment insurance data. American Association of Community Colleges White Paper, Fall 2000.

Nathan, J. (1986). Implications for educators of time for results. KAPPAN. 68, 201.

Newman, F. (1985). Higher education and the American resurgences. New York, NY: The Carnegie Foundation.

Oakland Community College (1992). Economic impact study, 1992. Farmington, MI: Oakland Community College. (ERIC Document Reproduction Service No. ED353012)

Romano, R., & Herbert, N. (1985). The economic impacts of the college on the local economy. Binghamton, NY: Broome Community College. (ERIC Document Reproduction Service No. ED253293)

Rouse, C. E. (1992). The other college: The economic benefits of community colleges (Doctoral dissertation, Harvard University, 1992). Dissertation Abstracts International, 53, 1601.

Rubi, D. C. (1995). The state's return on investment in the Arizona community colleges. Phoenix, AZ: State Board of Directors for Community Colleges of Arizona.

Ryan, G. J. (1983). Handbook for conducting a study of the economic impact of a community college. Lincroft, NJ: Brookdale Community College. (ERIC Document Reproduction Service No. ED233755.

Ryan, G. J. (1985). A shortcut to estimating economic impact. Community/Junior College Quarterly of Research and Practice, 9(3) 197-214.

Saleh, A. M. (1988). The local economic impact of alternative state budget reductions for selected Texas community colleges (Doctoral dissertation, University of North Texas, 1988). Dissertation Abstracts International, 49(06A), 1354.

Schuyler, G. (1997). The assessment of community college economic impact on the local community or state. Community College Review, 25(2), 65-79.

Selgas, J. W. (1973). Harrisburg, PA: Harrisburg Area Community College.(ERIC Document The impact of the college on the local economy. Research report No. 11. (ERIC Document Reproduction Service No. ED072779)

Singleton, R. G. (1994). A study of the economic impact of Floyd College on its local economy and a comparison of that impact to the economic impact of Bevill State Community College on its local economy (Doctoral dissertation, University of Alabama, 1994). Dissertation Abstracts International, 55(06A), 1458.

Snyder, S. A. (1998). Connecting teaching and learning at a research university: The cooperative learning seminar. Unpublished doctoral dissertation, Colorado State University: Fort Collins, CO.

Stokes, K. (1998). The local economic impact of higher education: An overview of methods and practices. AIR Professional File, 67, 1-13.

Turiciano, A. J. (1980). Estimating the economic impact of the Illinois Community College System, 1965 to 1978 (Doctoral dissertation, Illinois State University, 1980). Dissertation Abstracts International, 42(01A), 0048.

Two-Year College Committee of the Eastern Association of College and University Business Officers, (1989). The economic impact of colleges on their communities and states. Jamestown, NY: EACUBO.

Wyoming Community College Commission (1999). Biennial Budget Authority. Cheyenne, WY: Wyoming Community College Commission.

Wyoming Community College Commission (2000). Enrollment Report: 1999-2000. Cheyenne, WY: Wyoming Community College Commission.

Wyoming Department of Employment (2001). Wyoming Labor Force Trends 38(4), 15.

Zeiss, P. A. (1986). The economic impact of Pueblo Community College, 1985-86. Pueblo, CO: Pueblo Community College. (ERIC Document Reproduction Service No. ED275381)