
Research Report

February 2006



Center for Educational Performance & Accountability

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“Putting Minds to Work” Pays Big Dividends! The Impact of Florida Community Colleges on Students’ Prosperity and the State’s Economy: A Solid Return on Investment

Florida’s economic, civic, and cultural health is reliant upon an educated citizenry. Community colleges make numerous meaningful contributions toward this end. In this report, Florida TaxWatch examines the impact of Florida’s community colleges on students’ prosperity and on the state’s economy.

Executive Summary

Florida’s 28 community colleges have a broad mission and multiple responsibilities. They chiefly provide academic and technical degree education. Most of their students are part-time. Their average age is 27. During the 2004–2005 fiscal year, more than 800,000 students sought educational enhancement through the community college system.

Community colleges are part of the state’s new K–20 education system. The Florida Legislature established this system in 2002 as a means of providing, within existing resources, a seamless academic program for the state’s kindergarten through graduate school students. It emphasizes a student-centered approach to learning, maximized access to educational offerings, and a focus on institutional accountability.

These basic principles are explicitly demonstrated within Florida community colleges. They offer a variety of programs designed to meet the particular needs and personal objectives of their students. These institutions have formed solid relationships with their communities and partnered with school districts, colleges and universities in an effort to increase student educational access. They have reflected a commitment to accountability through public reporting and funding mechanisms.

Yet the landscape in Florida postsecondary education continues to change. The lines are blurring between programs offered exclusively by universities and those offered by the

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community colleges. As tuitions increase and financial aid tightens, more and more students are turning to community colleges as a preferred route. Evidence suggests that Florida community colleges are ready to meet this challenge.

Community colleges receive state funding. In the 2004–05 fiscal year, Florida’s community colleges were appropriated \$849 million dollars from General Revenue and another \$99 million dollars from the Lottery. Student fees provided an additional \$459 million dollars in revenue to these institutions. An investment of this magnitude requires an evaluation of its return. It is likewise appropriate to conduct a review of existing literature on community college issues, and to examine relevant state and national data.

It was with these two matters in mind that Florida TaxWatch, in consultation with Florida State University’s Center for Economic Forecasting and Analysis, undertook this study of the state’s community college system and its impact on the Florida economy.

The Ten Major Findings:

In National Comparisons:

- 1. A Florida community college outperformed the average in all seven areas that were studied. (Hillsborough Community College was used for these comparisons.)**
- 2. A community college education resulted in higher earnings compared to those from a high school education. Students realized an annual earnings increase of \$112 per credit hour and \$3,926 per full-time equivalent student.**
- 3. An investment analysis found that community college educational benefits outweighed their costs. The average rate of return from national studies on community colleges was 25%, the average benefit/cost ratio was seven, and the average payback was seven years. The rate of return on investment in Florida community colleges was 33.9%.**
- 4. The social savings (avoided costs of crime, welfare, and unemployment benefits) due to community college education were significant. They averaged \$35 annually per credit hour and \$1,353 annually per full-time equivalency.**

In Florida:

- 5. A significant majority (60%) of high school graduates who advanced to higher education attended community college, thus generating an ongoing increase in student enrollment. The community college full-time student population increased by 25% from 235,527 in 1999 to 294,818 in 2004. Simultaneously, an increased funding burden was required of students for six out of the seven years. Full-time enrollment is projected to continue to climb, surpassing 320,000 by 2007.**

6. A majority of the fastest growing jobs will be in occupations that do not require a baccalaureate degree but do require postsecondary education such as that offered at community colleges.
7. A community college Associate in Science Degree translated to a lifetime personal income increase of \$480,000 when compared with those whose formal education ended at high school graduation.
8. A community college Associate in Arts Degree translated to a lifetime personal income increase of \$220,000 when compared to those whose formal education ended at high school graduation.
9. The projected economic effects of increased personal income associated with a community college degree were found to be dramatic. Over a forty-year career span, the 38,968 students who graduated from community college in 2003 will increase state output by \$13.6 billion, and generate wages for others in the amount of \$5.5 billion. Additionally, they will create 102,768 jobs, which reflects 2.6 jobs for Florida's economy for each community college graduate.
10. Every dollar of public support for a community college graduate with an Associate in Science or an Associate in Arts Degree will generate \$13.37 in state output.

Florida community colleges generate a large number of benefits to both students and the state. Students benefit from higher personal earnings, and the state benefits by having higher employment, enhanced tax revenues, and an increased gross state product. There are additional advantages to the state in the form of social savings through avoided costs of crime, welfare, and unemployment benefits. These elements entice new businesses and industries to come to Florida, which further supports a growing, vigorous economy.

The motto of Florida's community colleges is "Putting Minds to Work." It is paying significant dividends. The study concludes that Florida community colleges play an increasingly vital role in the state and local economies by providing the education necessary for sustainable employment and by elevating the skills and earnings of Floridians. These benefits translate into attractors for new business and industry for the state, thus furthering additional growth.

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INTRODUCTION

Community colleges play a vital role in Florida's unique system of postsecondary education. These 28 institutions, located on 52 campuses throughout the state, provided instruction to 800,000 students during the 2004–05 fiscal year.¹ This reflects the comprehensive outreach of these sites of higher learning.

Florida's community colleges have a broad mission and multiple responsibilities. They chiefly provide academic and technical degree education. Most of their students are part-time. Their average age is 27.

The Florida Legislature has long recognized the importance of the state's community colleges and set them up to play a major role in the newly-crafted K–20 education system of 2002. As cited in Section 1004.65(6), Florida Statutes, the primary mission and responsibility of community colleges is responding to community needs for postsecondary academic education and technical degree education. The statute specifies several service responsibilities, including:

- Providing lower level undergraduate instruction and awarding associate degrees.
- Preparing students directly for vocations requiring less than baccalaureate degrees.
- Providing student development services to ensure student success.
- Providing dual enrollment instruction.
- Promoting economic development for the state within each community college district through the provision of special programs, including, but not limited to, the:
 1. Enterprise Florida-related programs
 2. Technology transfer centers
 3. Economic development centers
 4. Workforce literacy programs

The statute goes on to establish a separate and secondary role for community colleges, including:

- Providing upper level instruction and awarding baccalaureate degrees as specifically authorized in law.
- The offering of programs in certain community services, adult general education, and recreational and leisure services.

Students may access a large array of programs through their local community colleges. Three of these, the Associate in Arts (AA) Degree, the Associate in Science (AS) Degree, and the Associate in Applied Science (AAS), are integral to this report. The AA degree is a credential relative to a core curriculum required for the first two years of study toward a

¹ Florida Department of Education Website: http://www.fldoe.org/cc/facts_glance.asp, retrieved on July 5, 2005.

baccalaureate degree. The AS and AAS are career-specific degrees, such as Radiography, Criminal Justice Technology, and Nursing. AS and AAS recipients generally seek to enter the workplace in their field of study directly upon graduation although they may pursue a 4-year degree.

The state, therefore, recognizes the genuine importance of community colleges in meeting the educational needs of Florida's adult students. In scientific terms, this is called "investment in human capital."

This study seeks to meet two specific goals. One is to conduct an extensive review of current research about community colleges. The other is to quantify the return on the investment in human capital in Florida community colleges for the designated groups of Associate in Science/Applied Science Degree graduates and Associate in Arts Degree graduates. As regards this second goal, their impact on Florida's economy has been examined. Specific attention has been paid to personal earnings, employment, and welfare expenditures. Florida high school graduates from 1994, and community college graduates from 2003, have served as the base groups for this part of the study.

Determining the Economic Impact of Community College Graduates: The Design of the Study

People have long presumed that a college education is beneficial, and numerous studies have supported this precept. In Part One of this report, Florida TaxWatch has conducted an extensive community college literature review relative to three major areas, including a general review of the theories of economics, a compilation and analysis of specific community college impact studies throughout the United States and Canada, and the identification of 16 historical trend points for Florida community colleges. The latter two contain summary findings along with detailed charts and explanations.

In Part Two of the report, researchers quantified the actual economic impact of a community college degree, in terms of both personal earnings and economic value to the state. The structure for such analysis is complicated and highly dependent upon scientific models and designs.

For certain sections, this study used as its base group Florida students who graduated from high school in 1994. An assessment was made of the connection between their earnings and their educational paths over eight years, or until 2002. It was necessary to establish categories for the educational path component, and the groups that emerged are reflected in the following:

- Highest Educational Credential of High School Diploma
- Highest Educational Credential of Associate in Science Degree
- Highest Educational Credential of Associate in Arts Degree

The actual earnings of the individuals within each group were then tracked over time to establish the findings relative to personal income. These figures yielded data as to the economic impact to the individual student.

The determination of economic impact to the state of Florida was made by using the Regional Economic Model (REMI) which measures direct, indirect, and induced economic impacts. The REMI model is structured to capture the total impact of any economic event. The model relies on two key assumptions: consumers maximize their utility and producers maximize their profits. This means that higher earnings due to higher education creates higher demand in the economy and results in higher production, employment, and tax revenues. In other words, when a community college graduate earns more, he/she will spend more. This spending will create demand for business and increase production and employment in the economy. Any spending in the economy will have a cyclical impact in a well-integrated market. The REMI model was used to capture the total economic impact of community college graduate spending due to higher earnings.

Peripheral effects and indicators were also identified and examined. These included the impact on the social system, such as crime and welfare assistance, and certain elements of the educational system, such as demographics.

It should be noted that community colleges offer programs that either do not culminate in Associate in Arts, Associate in Science, or Associate in Applied Science college degrees or that culminate in baccalaureate degrees. The scope of this research project did not address these elements.

PART ONE: THE LITERATURE REVIEW

General Research

Florida TaxWatch examined a large number of existing research documents in the creation of this report. These have been identified in the reference section.

There have been many studies on the impact of education on economic development since the creation of endogenous growth theories in the 1980s. Romer (1986, 1987, 1989), Lucas (1988), and Robelo (1991) put education at the core of economic growth. They argue that education is the engine of an economy. Therefore, universities and community colleges are increasingly considered to be a central part of local economies (Huggins & Cooke, 1997). They stimulate jobs, foster new businesses, promote innovation, empower workers, improve the quality of life, and increase production. Education also helps society gain savings associated with reduced crime, unemployment and welfare, and improved health.

Review of Community College Impact Studies

Perhaps the most compelling of the research studies that were examined for this report were conducted by CCbenefits, Inc., an entity created in collaboration with the Association of Community College Trustees (ACCT) to streamline and facilitate the process of estimating economic benefits generated by community colleges. Summary findings were established for eleven distinct community college studies. The institutions that were examined included one from Florida, which then allows Florida TaxWatch to compare Florida results with those from sites throughout the United States and Canada. The eleven studies that were utilized reported data from:

- Oregon Coast Community College (2003)
- Del Mar College in Texas (2002)
- Douglas College in Canada (2003)
- 33 community college districts in Washington (2003)
- Community colleges of Spokane (2003)
- 39 community colleges in Illinois (2003)
- 50 community college districts in Texas (2002)
- Madison Area Technical College in Wisconsin (2001)
- 16 community colleges in Maryland (2003)
- Clackamas Community College in Oregon (2003)
- Hillsborough Community College in Florida (2003)

The studies examined three generic categories of the socioeconomic benefits of community colleges. These categories were higher earnings, investment analysis, and social savings. Each of these was further detailed into subgroups, yielding a total of seven discrete comparison elements. These elements were:

- Higher Earnings: Per Credit Hour
- Higher Earnings: Per Full-Time Student

- Investment Analysis: Rate of Return
- Investment Analysis: Benefit/Cost Ratio
- Investment Analysis: Payback Years
- Social Savings: Per Credit Hour
- Social Savings: Per Full-Time Student (FTE)

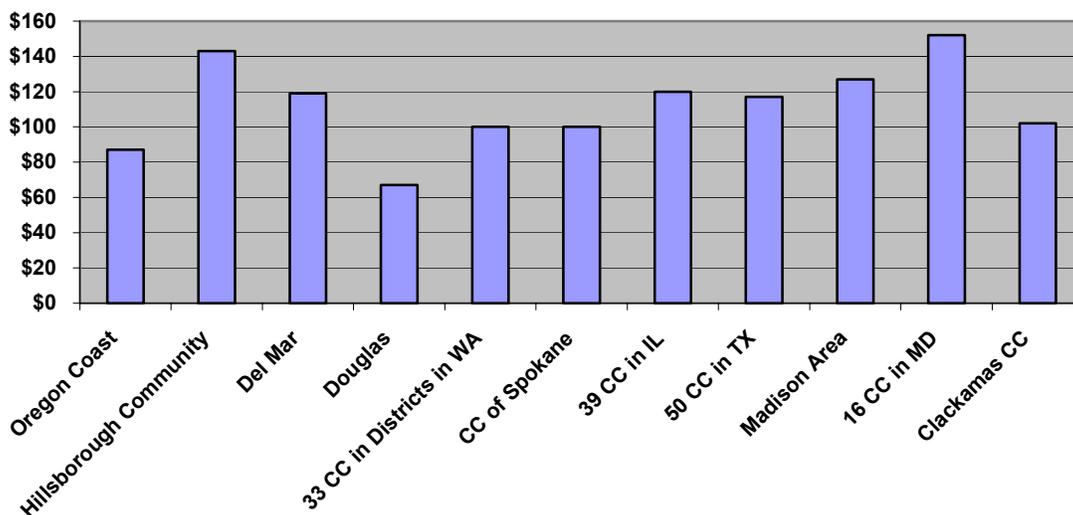
The findings from each of these seven areas have been detailed in the following section. The summary findings are as follows:

1. Higher education via community college resulted in higher earnings. The average annual higher earnings were \$112 per credit hour and \$3,926 per full-time equivalent (FhTE or full-time student).
2. Investment analysis found community college educational benefits to outweigh their costs. The average rate of return was 25%, the average benefit/cost ratio was seven, and the average payback was seven years.
3. Social savings due to community college education were significant. They averaged \$35 annually per credit hour and \$1,353 annually per full-time equivalent (FTE or full-time student).
4. In every case, Hillsborough Community College outperformed the average in the seven areas that were studied.

Higher Earnings Per Community College Credit Hour (Figure 1)

Higher education results in higher earnings. For each credit hour of community college education, a range of \$67–152 in annual higher earnings was found. An annual average of \$112 in higher earnings was also reported. Hillsborough Community College was well above this average, with a higher earnings annual average of \$143, the second highest in these studies.

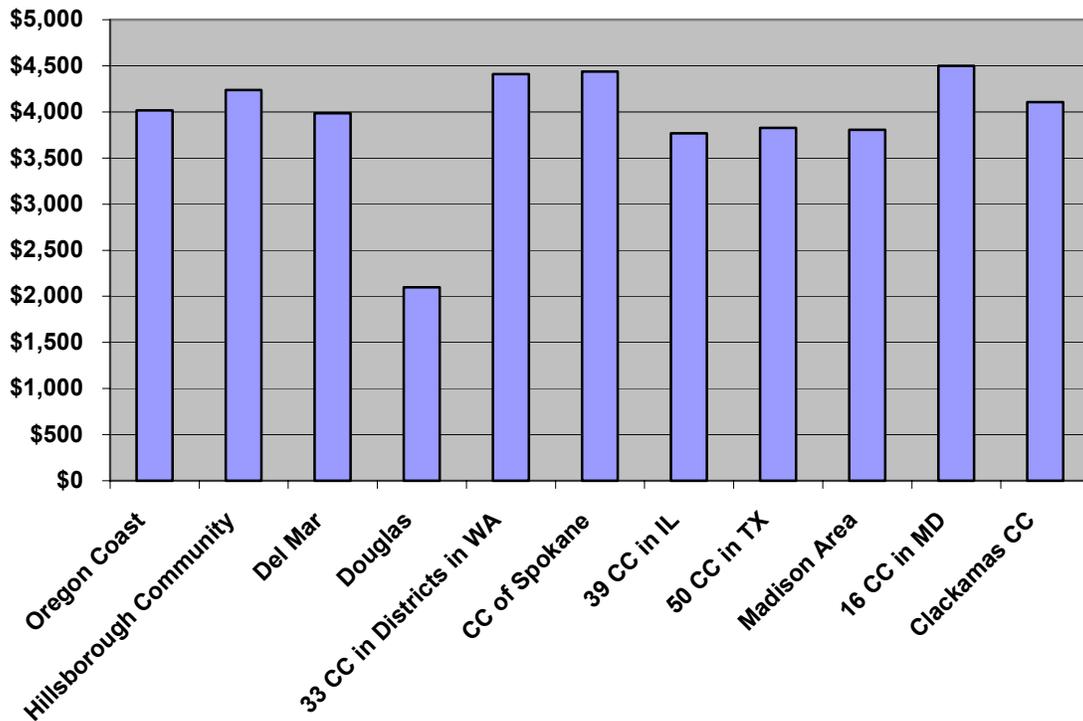
Figure 1. Higher Earnings Per Credit



Higher Earnings Per Community College Full-Time Equivalent Student (FTE) (Figure 2)

The annual higher earnings benefit per full-time equivalent student was found to be particularly significant. It ranged from \$2,099 in Canada to \$4,499 in Maryland. On average, an annual benefit of \$3,926 was reported. The benefit reflected in Hillsborough Community College’s data was greater than average, at \$4,238 per full-time student.

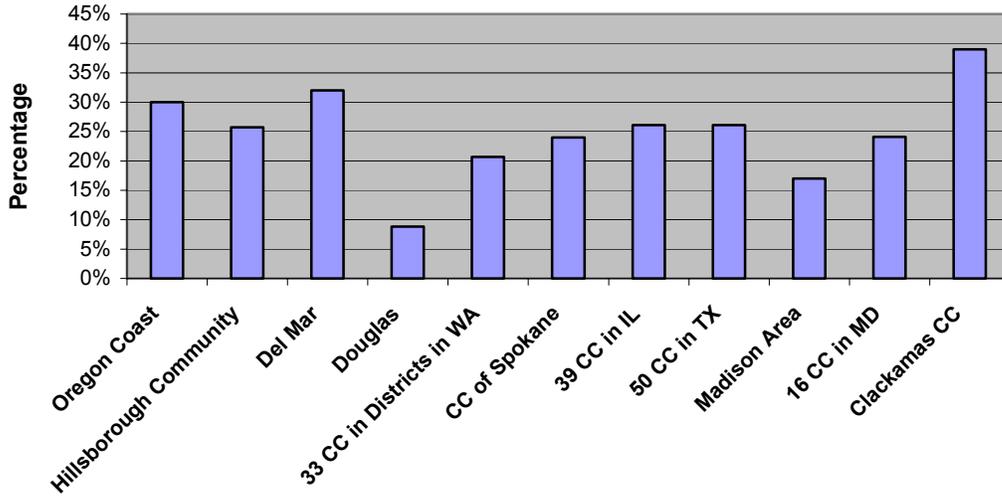
Figure 2. Higher Earnings Per Full-Time Equivalent Students



Investment Analysis: Rate of Return for Community Colleges (Figure 3)

Because it costs money to attend postsecondary institutions, including community colleges, it is important to identify whether these dollars provide a sound return for the educational investment as opposed to investment in some other forum. In essence, it must be determined whether the benefits outweigh the costs to achieve them. The data indicated that an investment in community college education had a rate of return ranging from 9% in Canada to 39% in Oregon at Clackamas Community College. The average return was 25%. Hillsborough Community College exceeded this average by 1%.

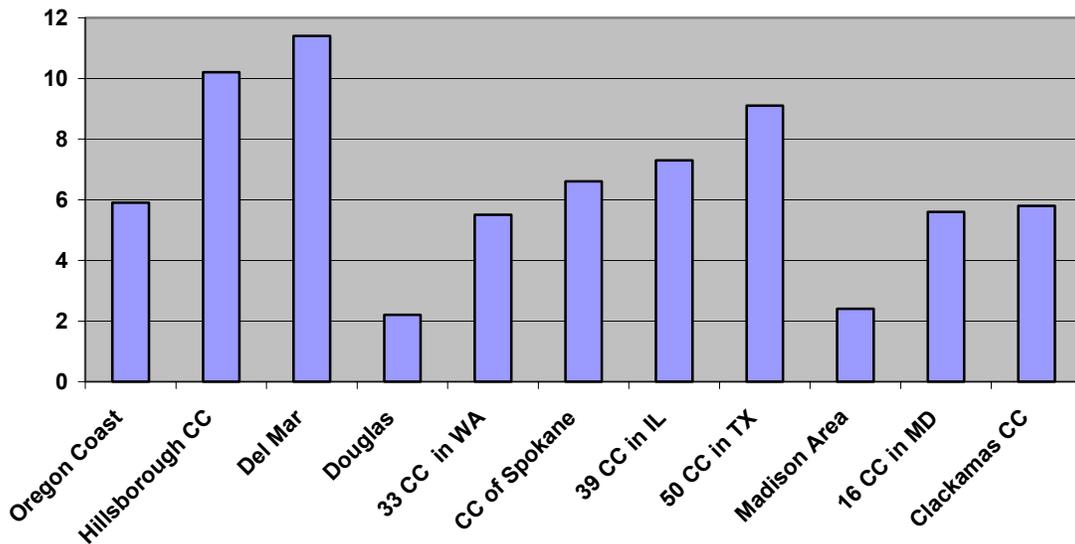
Figure 3. Internal Rate of Return



Investment Analysis: Benefit/Cost Ratio for Community Colleges (Figure 4)

The Benefit/Cost (B/C) ratio is simply another way of determining whether the benefits of the educational expenditures outweigh the costs to achieve them. The B/C ratio is derived by dividing the present value of benefits by the present value of costs. In these studies, a range was found of 2.2 in Canada to 11.4 at Del Mar in Texas. An average of 7 was identified. The 7 B/C ratio means that a dollar invested today will generate a cumulative \$7 over the investment period. Hillsborough Community College had appreciatively higher results, with a B/C ratio of 10.2.

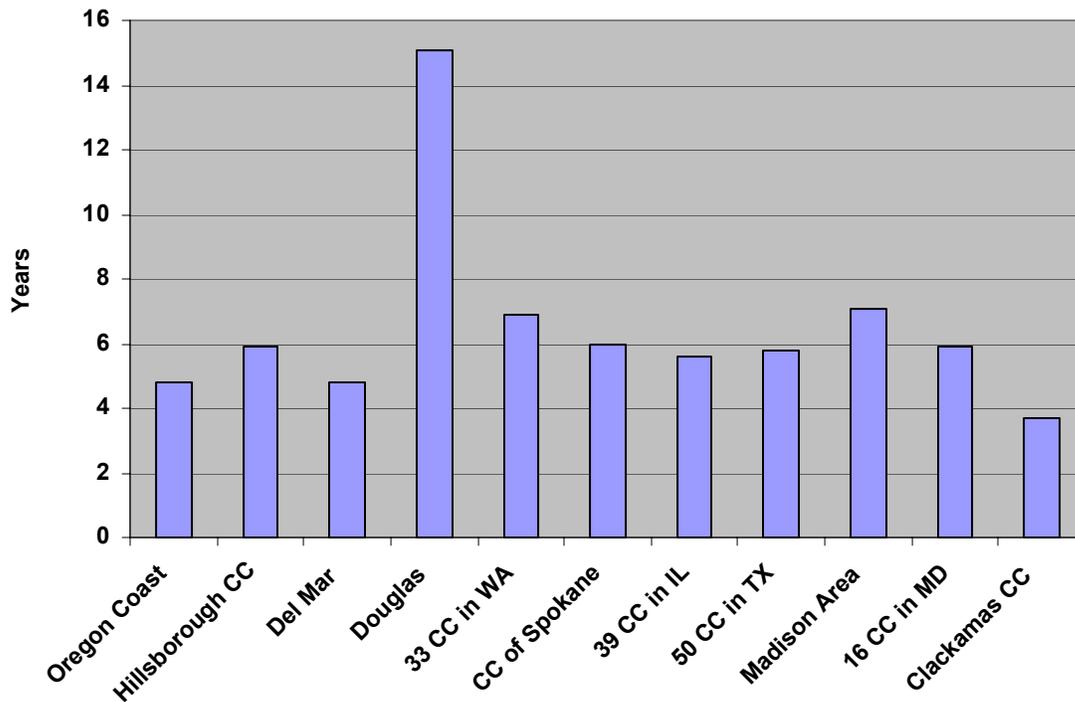
Figure 4. Benefit/Cost Ratio for Community Colleges



Investment Analysis: Payback Period for Community College Graduates (Figure 5)

The payback period is used to find out how long it will take for an investment to be profitable. The shorter the payback period, the stronger the investment will be. The data from the eleven studies found a range from 3.7 years at Oregon's Clackamas Community College, to 15.1 years in Canada. The average payback period was 7 years. Hillsborough County Community College produced even greater benefit, as its payback period was only 5.9 years.

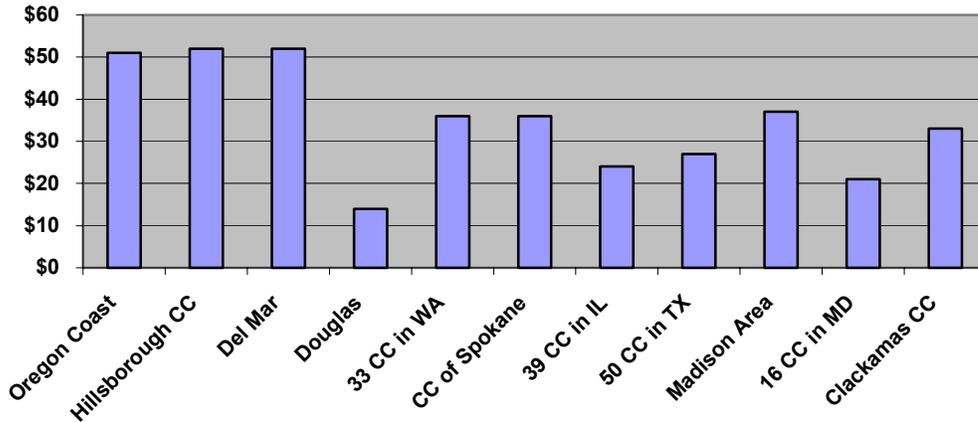
Figure 5. Payback Period for Community College Graduates



Social Savings: Per Community College Credit Hour (Figure 6)

Certain social savings based on educational level are measurable. Avoided costs of welfare and unemployment assistance are two examples of data used for this purpose. Results from the eleven studies found that savings were pronounced. They ranged from \$14 annually in Canada to \$52 annually in Florida at Hillsborough Community College and in Texas at Del Mar. On average, \$35 per credit hour per year was realized in social savings.

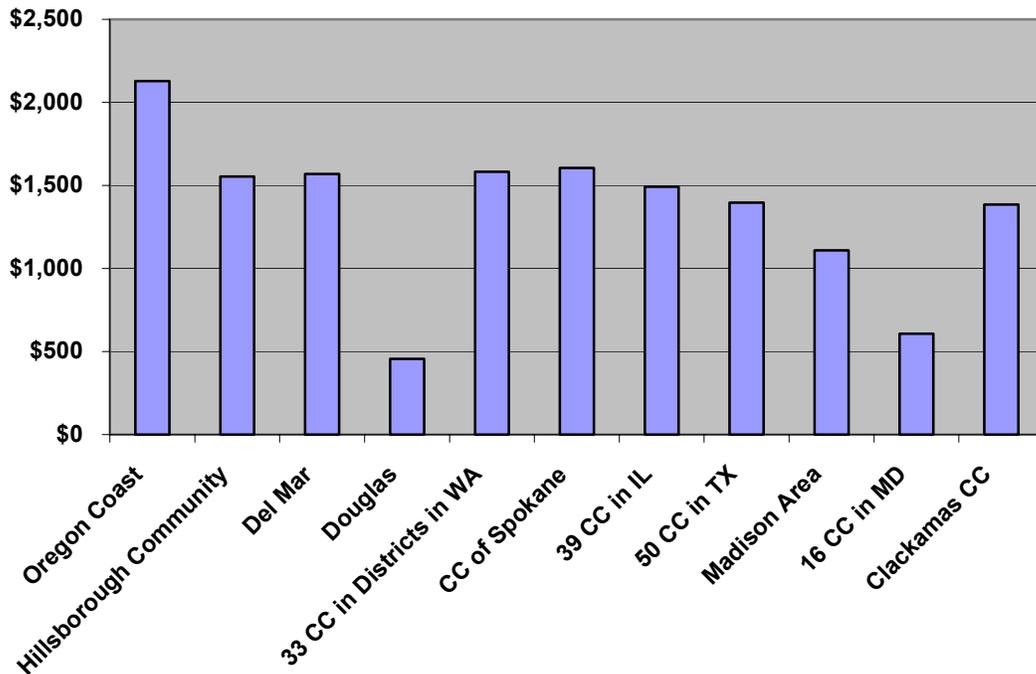
Figure 6. Social Savings Per Credit Hour



Social Savings: Per Community College Full-Time Equivalent Student (FTE) (Figure 7)

Social savings were also computed for full-time students. These were found to be substantial, with a range from \$455 in Canada to \$2,129 in Oregon. The average savings was \$1,353 per year. Hillsborough Community College results were even higher. They showed an average annual savings of \$1,553.

Figure 7. Social Savings Per Full-Time Equivalent Student



Summary: Socioeconomic Benefits Generated by Community Colleges

The findings from the eleven studies demonstrated significant benefits in all comparison areas as depicted in Table 1. *In every instance, Hillsborough Community College outperformed the average.*

Table 1. Socioeconomic Benefits Generated by Community Colleges (CC)

	Oregon CC	Hillsborough CC	Del-Mar CC	Douglas CC	30 CC in WA	CC of Spokane	39 CC in IL	50 CC in TX	Madison T.C.	16 CC in MD	Clackamas CC	Average
1) Higher Earnings												
Per Credit	\$87	\$143	\$119	\$67	\$100	\$100	\$120	\$117	\$127	\$152	\$102	\$112
Per year FTE student	\$4,018	\$4,238	\$3,984	\$2,099	\$4,409	\$4,439	\$3,767	\$3,826	\$3,806	\$4,499	\$4,105	\$3,926
2) Investment Analysis												
Rate of Return (%)	30	26	32	9	21	24	26	26	17	24	39	25
Benefit / Cost Ratio	5.9	10.2	11.4	2.2	5.5	6.6	7.3	9.1	2.4	5.6	5.8	7
Payback (years)	4.8	5.9	4.8	15.1	6.9	6	5.6	5.8	7.1	5.9	3.7	7
3) Social Savings												
Per Credit	\$51	\$52	\$52	\$14	\$36	\$36	\$24	\$27	\$37	\$21	\$33	\$35
Per year FTE student	\$2,129	\$1,553	\$1,569	\$455	\$1,583	\$1,605	\$1,493	\$1,397	\$1,109	\$607	\$1,385	\$1,353

Historical Trends Involving Florida Community Colleges

To establish an appropriate context for this study, Florida TaxWatch identified 16 trend points relative to the state's community colleges. These included data pertaining to student enrollment, employment opportunities for community college graduates, faculty, funding, costs, and expenditures. The 16 trends reflected in this report were:

- Student Enrollment: Number of High School Graduates Attending Higher Education Institutions (Including Community Colleges)

- Student Enrollment: Number of Community College Full-Time Students (FTE)
- Employment of Community College Graduates: Required Degrees for Past, Current and Future Employment (2004–2012)
- Community College Faculty: Increased Number of Faculty
- Community College Faculty: Percentage of Full-Time and Full-Time Equivalency Faculty to Total Faculty
- Community College Faculty: Number of Faculty Per Student
- Community College Funding: Sources of Revenue
- Community College Funding: Funds Per Student
- Community College Funding: Fund Source Percentages of Total Expenditures
- Community College Costs and Expenditures: Costs Per Functional Category
- Community College Costs and Expenditures: Costs Per Functional Category Per Student
- Community College Costs and Expenditures: Percentage Costs Per Functional Category Per Student
- Community College Costs and Expenditures: Faculty Salaries
- Community College Costs and Expenditures: Unfunded Deficit
- Community College Costs and Expenditures: Community College and State University System Comparisons

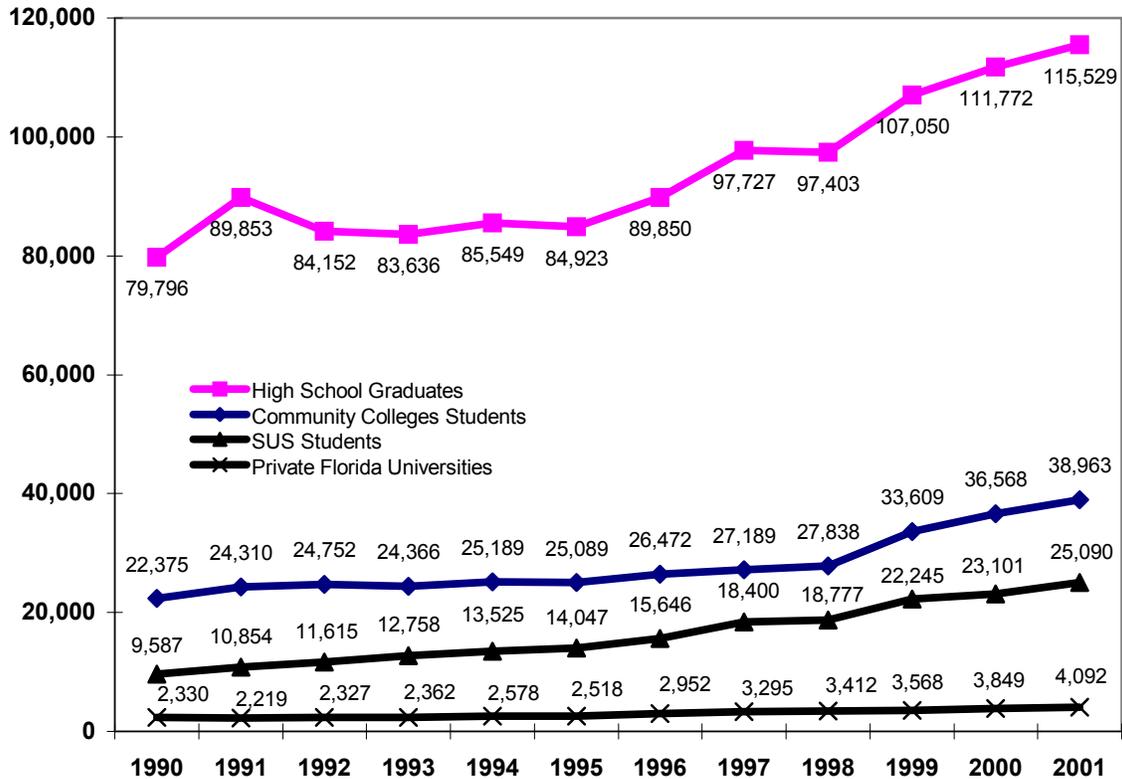
The historical trend findings from each of these 16 areas have been detailed in the following section. Some of the summary findings are:

1. A significant majority (60%) of high school graduates who advanced to higher education attended community college.
2. A significant majority (56%) of the fastest growing jobs in Florida will be in occupations that do not require a baccalaureate degree but do require postsecondary education such as that offered at community colleges.
3. Both the percentage of full-time faculty and the availability of faculty members to students have decreased over time.
4. Community college funds expended per full-time equivalent student grew steadily from 1996 through 1999 and then declined each year through 2003.
5. Of the funds available to community colleges, the highest percentage is devoted to the direct instruction of students.
6. An increased funding burden has been required of students from both community colleges and the state universities.

Historical Trend of Student Enrollment: Number of High School Graduates Attending Higher Education Institutions (Figure 8)

Between 1990 and 2001, the number of Florida high school graduates advancing to community colleges, the state university system, and private universities increased from 43% (34,292) to 59% (68,145).

Figure 8. Florida High School Graduates Attending Community Colleges and Public/Private Universities in Florida from 1990 through 2001



Sixty percent of Florida high school graduates who advanced to higher education between 1990 and 2001 attended community colleges versus 34% and 6% entering the state university system and private universities, respectively. In 2001, 38,963 (57.2%) of high school graduates entered community colleges, 25,090 (36.8%) entered the state university system, and 4,092 (6.0%) entered private universities.

Historical Trend/Projection of Student Enrollment: Number of Community College Full-Time Equivalent Students (FTE) (Figure 9)

For purposes of this study, a student with full-time equivalency was defined as enrolling for at least 30 credit hours per year. In 2004–05, community college faculty taught 294,818 full-time equivalent students. There were fluctuations regarding the number of community college full-time equivalent students from 1981 (170,313) to 2004 (294,818), but the numbers were increased an average of 3% during the period.

Figure 9. Historical and Projected Trend of Full-Time Florida Community College Students

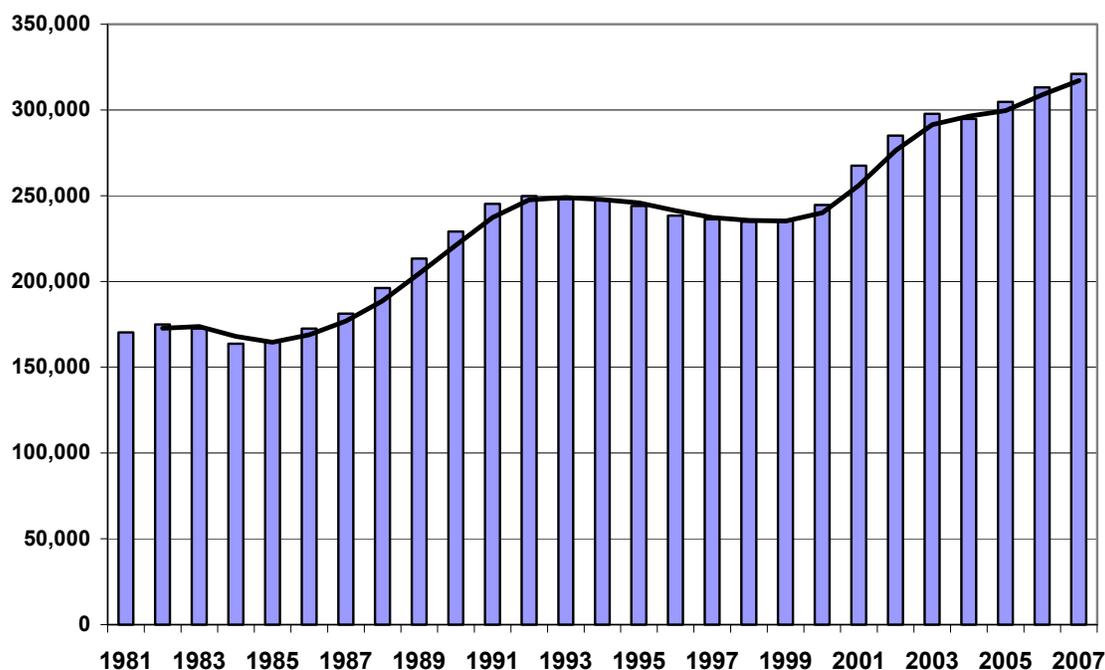


Figure 9 shows Florida community college full-time student enrollments jumped by 25% from 235,527 in 1999 to 294,818 in 2004.

The Department of Education forecasts an additional 9% increase to 320,971 by 2007.

Historical Trend of Employment of Community College Graduates: Required Degrees for Past, Current, and Future Employment (Figure 10)

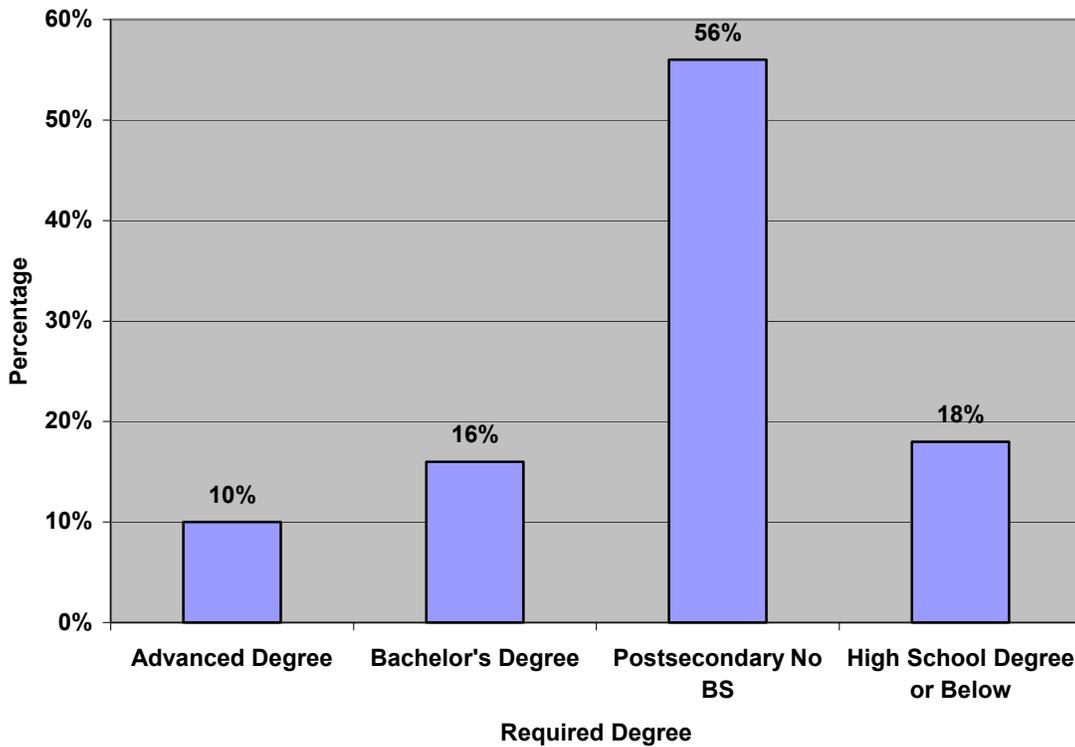
Florida community colleges have played an increasingly vital role in local economies by providing the education necessary for sustainable employment. Over half of the 100 fastest growing occupations in Florida do not require a baccalaureate or advanced degree but do require postsecondary education.

A recent Council for Education Policy Research and Improvement (CEPRI) report stated that “over 60% of the projected job growth in Florida through 2010 will be in occupations requiring postsecondary education and training but not a bachelor’s degree” (CEPRI, 2004). Among projected new jobs, 300,000 will require an associate’s degree and 500,000 will require a postsecondary certificate.

As depicted in Figure 10, Florida Agency For Workforce Innovation 2004–2012 employment projections indicate that 56% of the fastest growing jobs in Florida will be in

occupations requiring postsecondary education, but less than a bachelor’s degree. These are the future working Floridians who need to be educated in the community college system. This forecast is consistent with projected growth in community college student enrollment across the state described above.

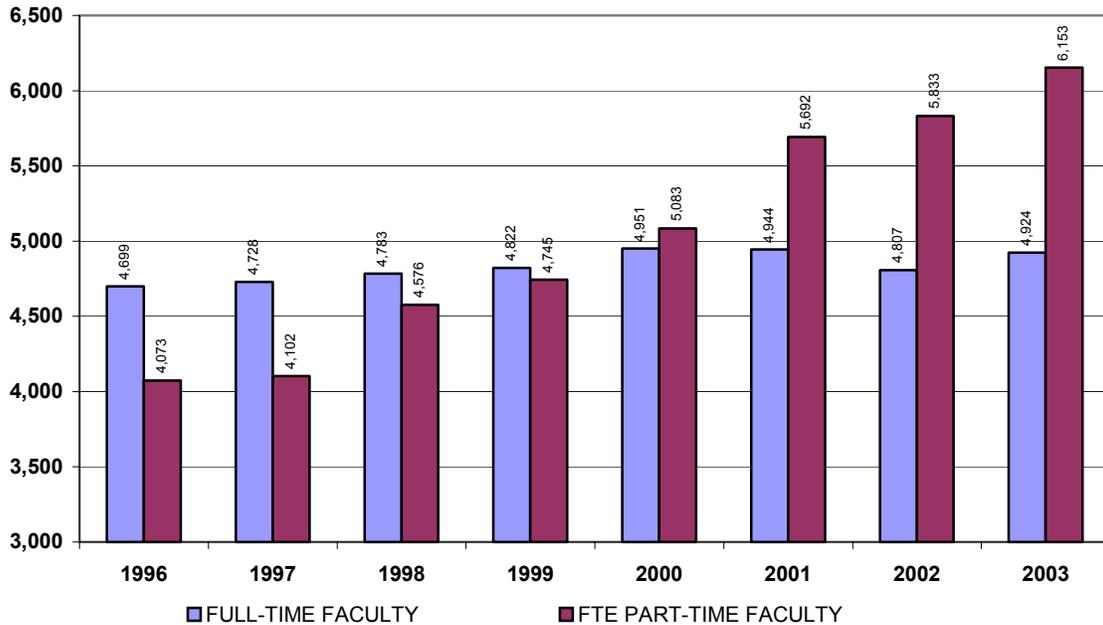
Figure 10. Education and Degree Requirements for the 100 Fastest Growing Florida Occupations (2004–2012)



Historical Trend of Community College Faculty: Increased Number of Faculty (Figure 11)

The number of full-time and full-time equivalent community college faculty has grown steadily since 1996. (For purposes of this study, three part-time faculty are equal to one full-time faculty.) Figure 11 shows that between 1996 and 2003, the number of community college faculty increased from 8,772 full-time equivalent (FTEs) to 11,077 FTEs. The proportion of full-time faculty is contributing to a quality community college education. The growth was necessitated by increased student enrollment.

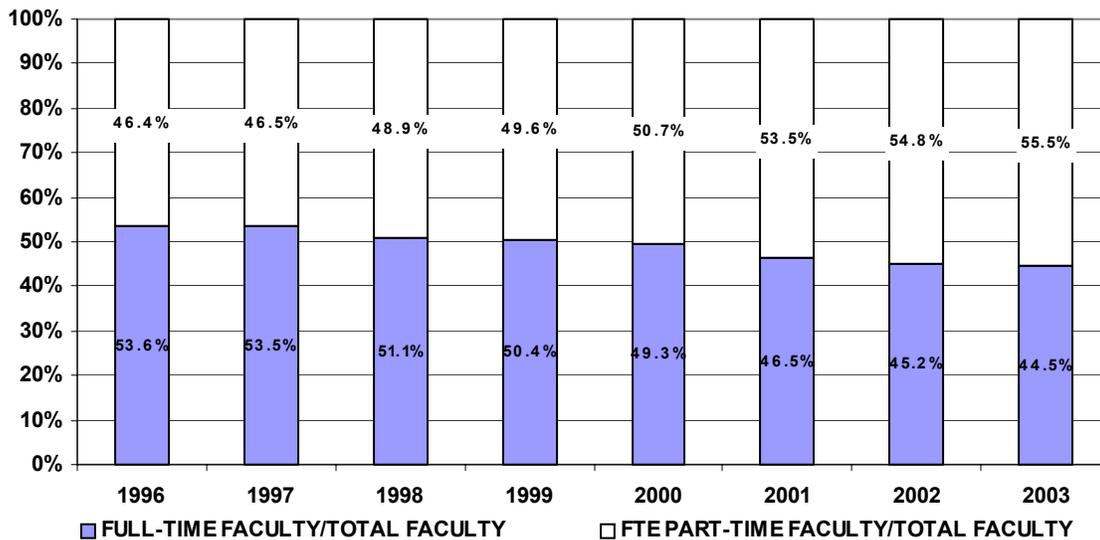
Figure 11. Trend of Full-Time and Full-Time Equivalent Part-Time Faculty



Historical Trend of Community College Faculty: Percentage of Full-Time/Full-Time Equivalency Faculty to Total Faculty (Figure 12)

From 1996 through 2003, the percentage of full-time faculty has decreased. It has declined from 53.6% of the total to 44.5%. Conversely, the percentage of part-time faculty has increased during the same period, from 46.4% to 55.5%.

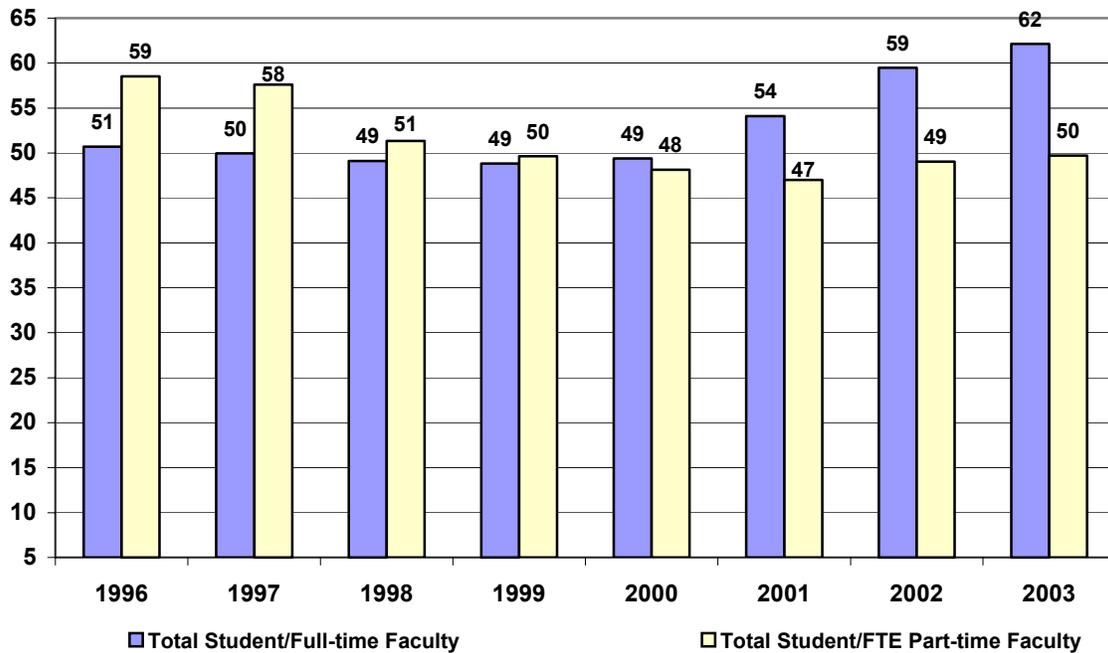
Figure 12. Percentage of Full-Time and FTE Part-Time Faculty to Total Faculty



Historical Trend of Community College Faculty: Number of Students Per Faculty (Figure 13)

The number of students per full-time faculty member has increased over the years. In 1996, there was an average of 51 students to each full-time faculty member. By 2003, that number had risen to 62 students per full-time faculty member. Per Figure 13, number of students per full-time faculty increased from 51 in 1996 to 62 in 2003; per full-time equivalent part-time faculty, the number of students decreased from 59 to 50 between 1996 and 2003.

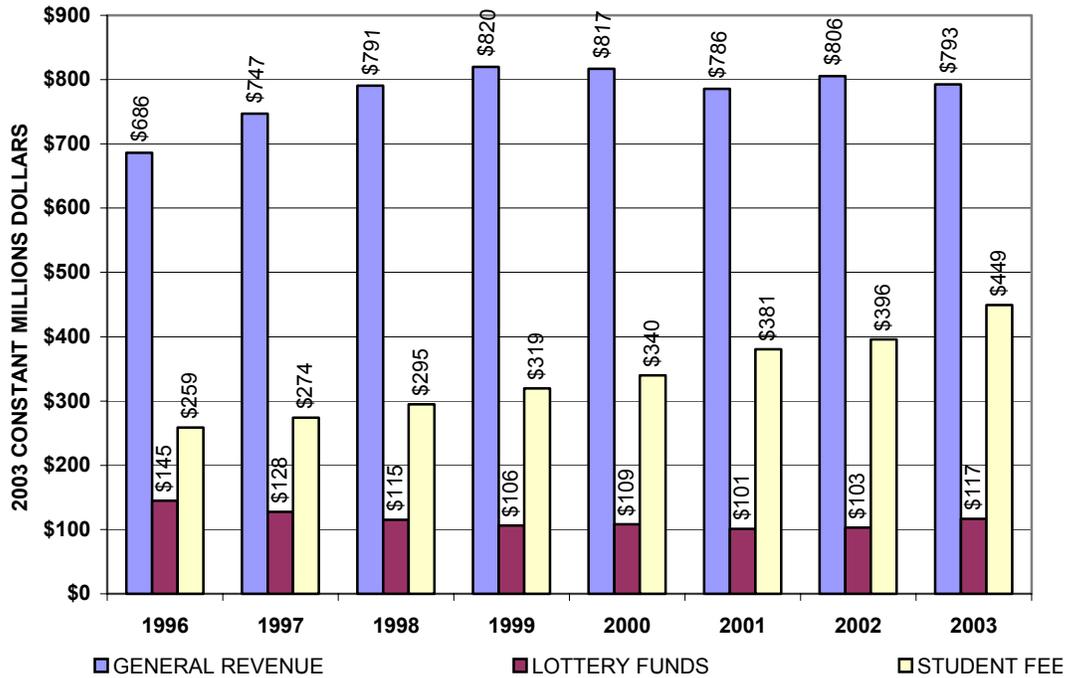
Figure 13. Number of Students Per Full-Time and Full-Time Equivalent Part-Time Faculty



Historical Trend of Community College Funding: Sources of Revenue (Figure 14)

The traditional sources of community college funding have been state general revenue, lottery funds, and student fees. Figure 14 represents the funding history by source from 1996 through 2003 in constant 2003 dollars. Although the sources for funding have fluctuated each year, the total funds have increased annually throughout the reporting period. General revenue increased from \$686 to \$793 million between 1996 and 2003, annual lottery funding decreased from \$145 to \$117 million, and student fees increased from \$259 to \$449 million. The most pronounced increase has been in the area of student fees.

Figure 14. Trend of Community College Funding

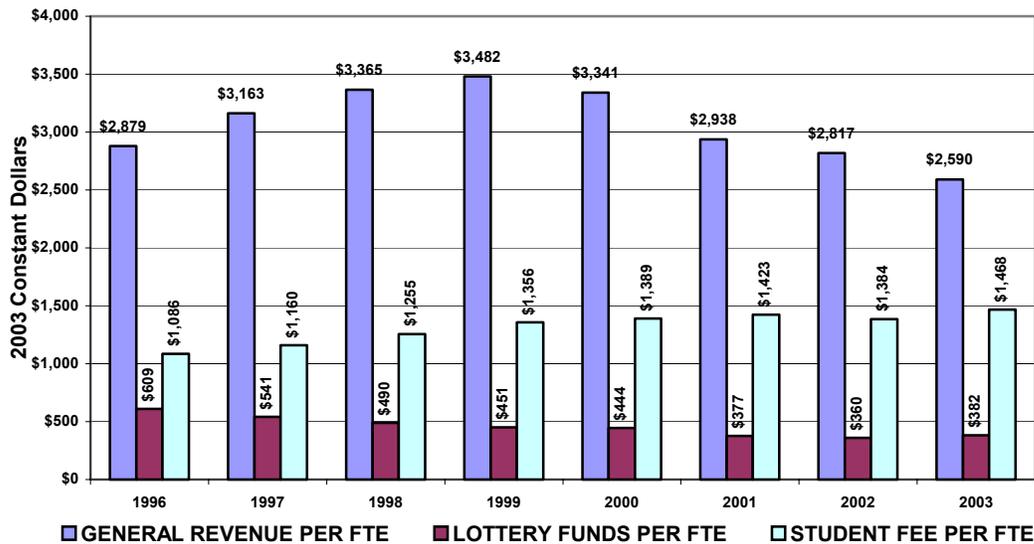


Historical Trend of Community College Funding: Funds Per Student (Figure 15)

Community college funds expended per full-time equivalent student grew steadily from 1996 through 1999 and then have steadily declined each year. From the peak in 1999 of \$5,289 per full-time equivalent student, the number dropped to \$4,440 per full-time equivalent student in 2003, in constant 2003 dollars.

Funding allocations per full-time equivalent student source have also changed. In 2003 constant dollars, general revenue increased from \$2,879 in 1996, to \$3,482 in 1999, then decreased to \$2,590 in 2003; lottery funds decreased from \$609 to \$382; and student fees increased from \$1,086 to \$1,468.

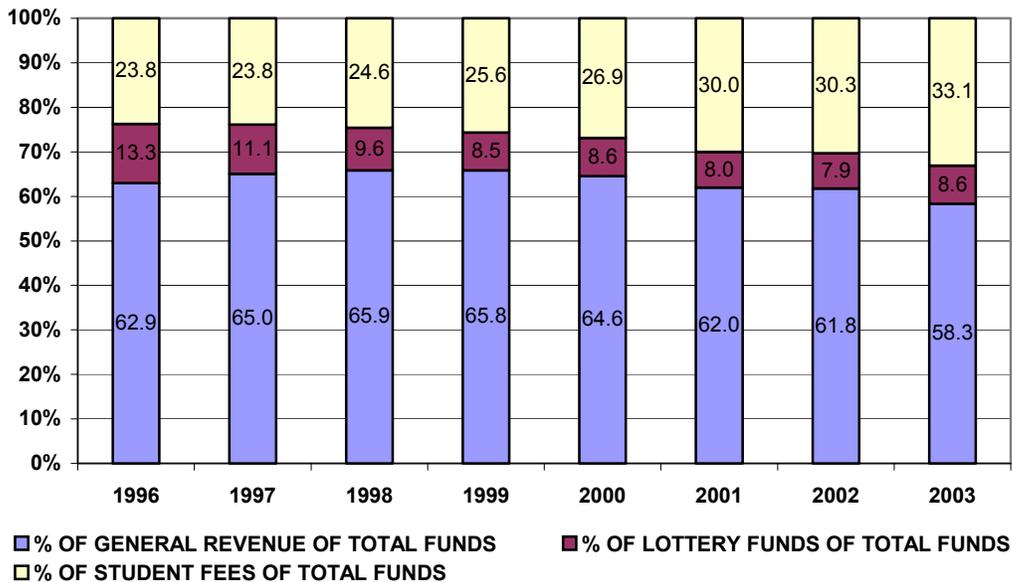
Figure 15. Trend of Community College Funding Per Student



Historical Trend of Community College Funding: Fund Source Percentages of Total Expenditures (Figure 16)

Figure 16 shows that between 1996 and 2003, the percentage of total community college funding provided by state general revenue and the lottery declined from 76.2% to 66.9% while the portion provided by student fees increased from 23.8% to 33.1%. Students are shouldering more of the costs.

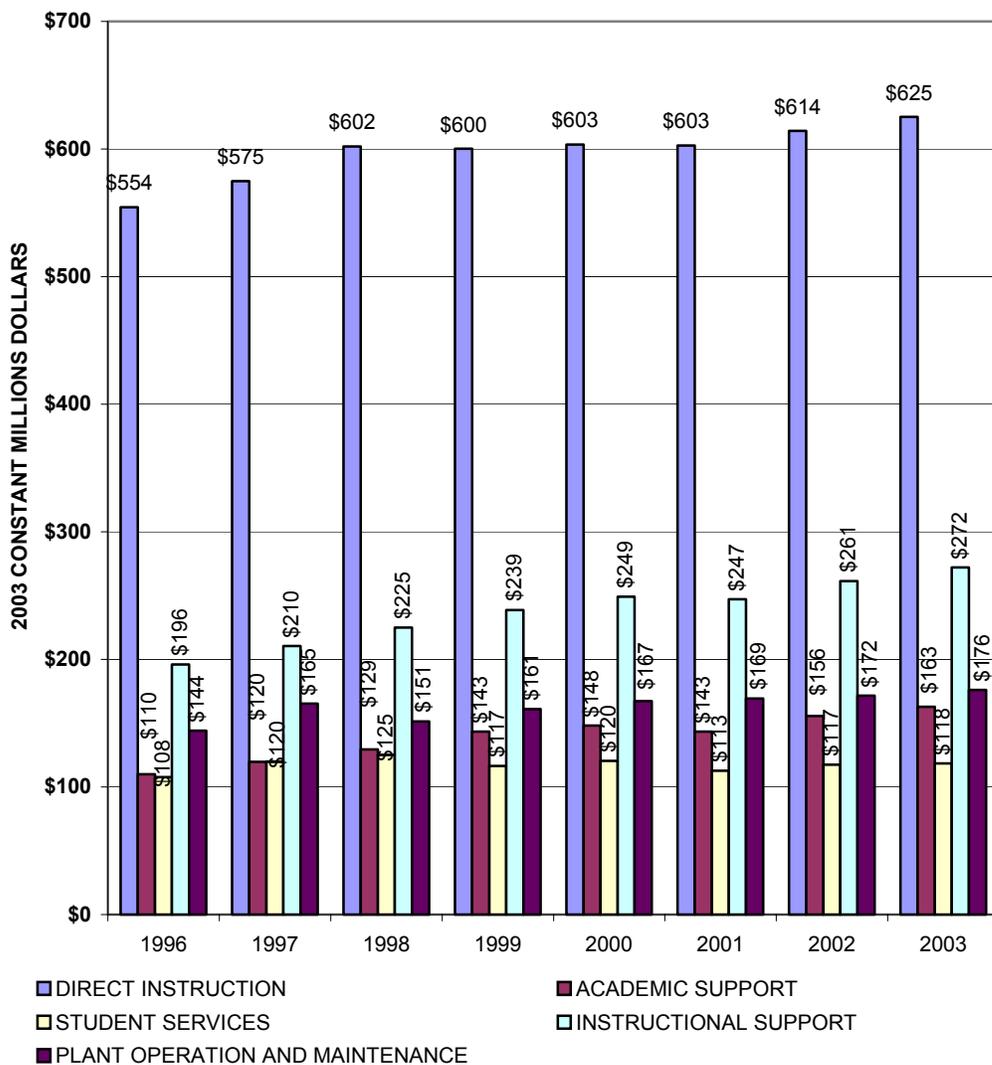
Figure 16. Percentage Trend of Community College Funding



Historical Trend of Community College Costs and Expenditures: Costs Per Functional Category (Figure 17)

Community college cost categories have consisted of direct instruction, academic support, instructional support, student services, and plant operation and maintenance. Between 1996 and 2003, direct instructional costs ranged from \$554 to \$625 million in constant 2003 dollars; academic support increased from \$110 to \$163 million; student services remained steady at around \$110 million; instructional support increased from \$196 to \$272 million; and plant operation and maintenance increased from \$144 to \$176 million.

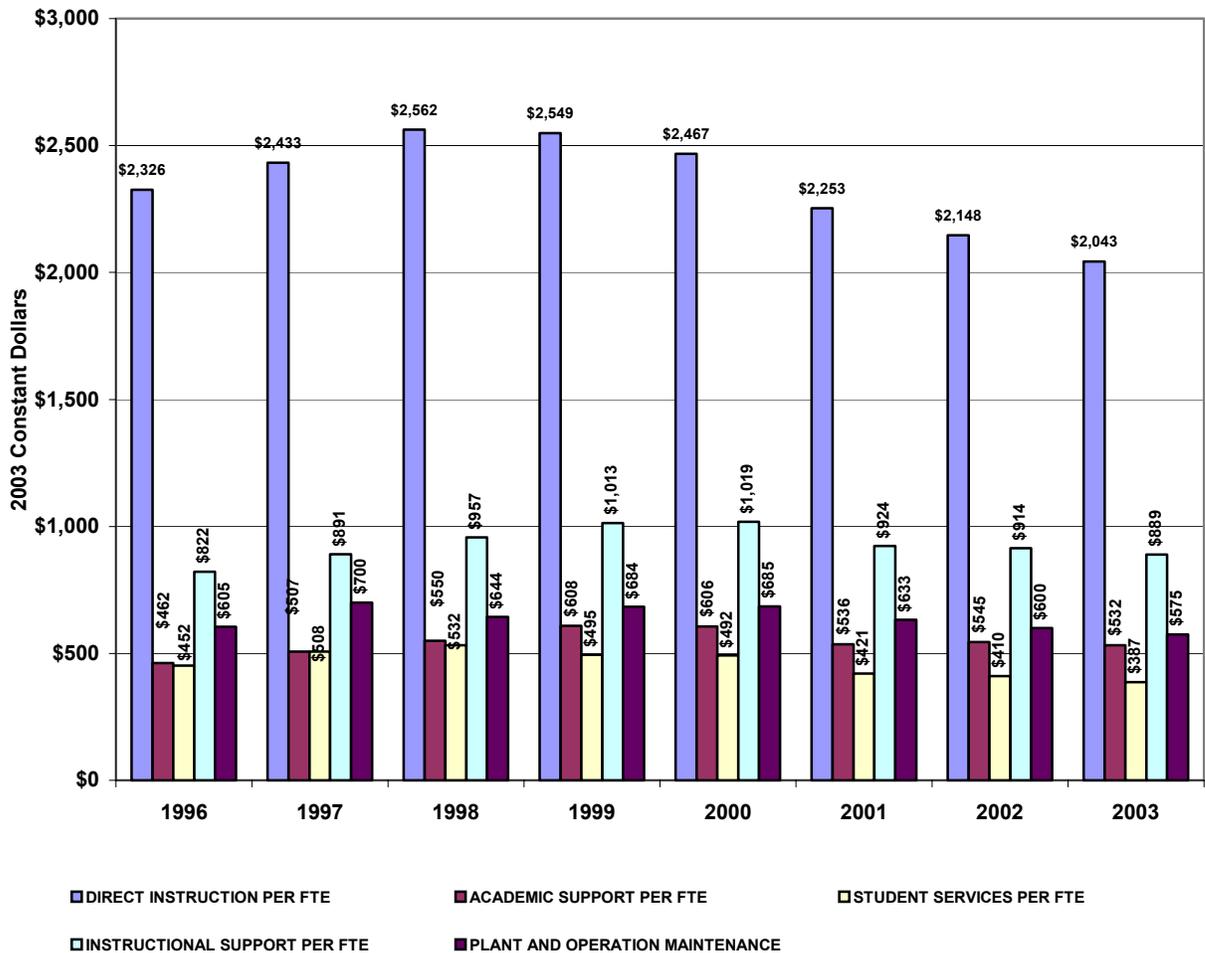
Figure 17. Trend in Community College Costs



Historical Trend of Community College Costs and Expenditures: Costs Per Functional Category Per Student (Figure 18)

In constant 2003 dollars, direct instructional costs per student—consistent with the trend of total community college costs—increased from \$2,326 in 1996 to \$2,562 in 1998, but decreased to \$2,043 in 2003. Academic support costs per student ranged from \$462 to \$532. Student services per student increased from \$452 in 1996 to \$532 in 1998, but decreased to \$387 in 2003. Instructional support per student costs increased from \$822 in 1996 to \$1,019 in 2000, but decreased to \$889 in 2003. Plant operation and maintenance increased from \$605 in 1996 to \$700 in 1997, but decreased to \$575 in 2003.

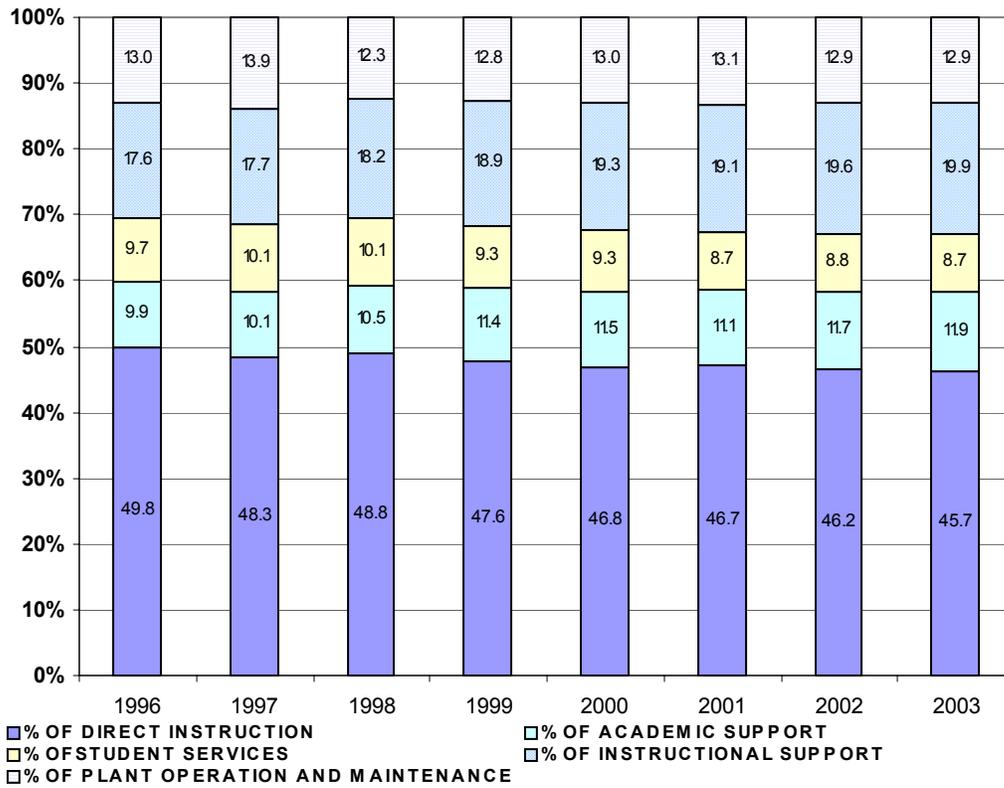
Figure 18. Trend in Community College Costs Per Student



Historical Trend of Community College Costs and Expenditures: Percentage Costs Per Functional Category Per Student (Figure 19)

Figure 19 shows that while the percentage of total cost of direct instruction decreased from 49.8% to 45.7% over the 1996–2003 period, academic support and instructional support costs increased from 9.9% and 17.6% to 11.9% and 19.9%, respectively. Student services costs decreased from 9.7% to 8.7%. Interestingly, plant operation and maintenance costs remained static at around 13%.

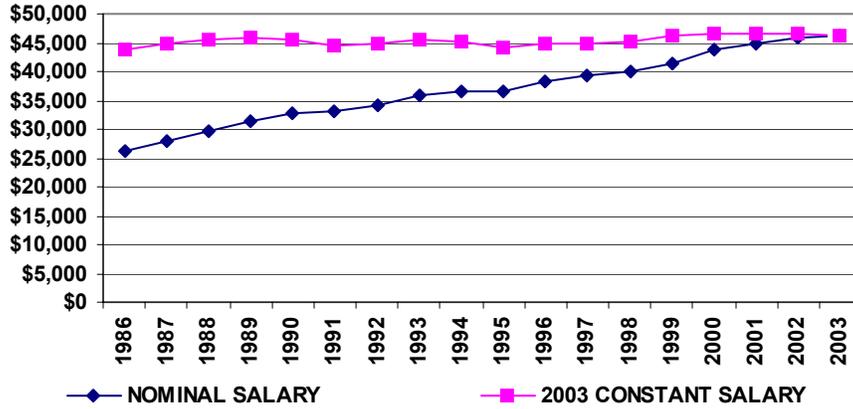
Figure 19. Percentage Trend of Community College Costs



Historical Trend of Community College Costs and Expenditures: Faculty Salaries (Figure 20)

Nominal (unadjusted by inflation) full-time equivalent faculty salaries between 1986 and 2003 increased from \$26,186 to \$46,370. However, in 2003 constant dollars they held steady at around \$45,000 for a nine-month contract.

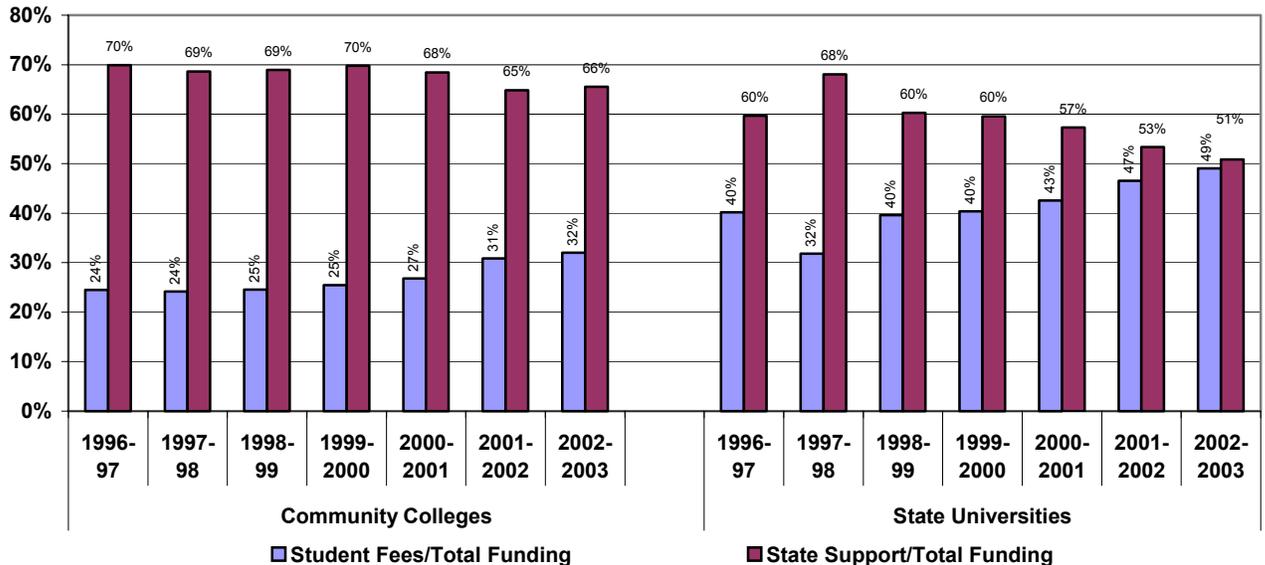
Figure 20. Trend of Full-Time Equivalent Faculty Salaries



Historical Trend of Community College Costs and Expenditures: Community College and State University System Comparisons (Figure 21)

Based on the trend of state support and student fees on Florida’s higher education, both the community college and the state university system show the same magnitude and direction. State support for Florida’s community colleges decreased from 74% of total funding in 1996–97 to 67% in 2002–2003. For the state university system, it declined from 60% to 51% of total funding during this period. By contrast, fees increased from 24% to 32% for community college students and from 40% to 49% for state university system students.

Figure 21. Comparison of State Support and Student Fees to Total Funding



PART TWO: THE IMPACT OF COMMUNITY COLLEGES ON FLORIDA’S ECONOMY

Student Tracking Over Time

Upon graduation from high school, most students either enter the workplace, including the United States military, or they pursue higher education. Many do both. This study sought to quantify the economic impact of those who chose to continue their formal education through the Florida community college system. Because students may access a large array of programs through their local community colleges, it was necessary to specify the pertinent programs of study. Three of these, the Associate in Arts (AA) Degree, the Associate in Science (AS) Degree, and the Associate in Applied Science (AAS) Degree, are integral to this report. The former is a credential relative to a core curriculum required for the first two years of study toward a baccalaureate degree. The last two are career-specific degrees, such as Radiography, Criminal Justice Technology, or Nursing. AS recipients generally seek to enter the workplace in their field of study directly upon graduation.

This study used as its base group Florida students who graduated from high school in 1994. An assessment was made of the connection between their earnings and their educational paths over eight years, or until 2002. It was necessary to establish categories for the educational path component, and the groups that emerged are reflected in the following:

- Highest Educational Credential of High School Diploma
- Highest Educational Credential of Associate in Science Degree
- Highest Educational Credential of Associate in Arts Degree
- Highest Educational Credential of Baccalaureate Degree

The actual earnings of the individuals within each group were then tracked over time to establish the findings relative to personal income. These figures yielded data as to the economic impact to the individual student.

Tracking Florida High School Graduates (Figure 22)

This study was facilitated through access to the *Florida Education and Training Placement Information Program (FETPIP)*. Since its establishment in 1988, the Florida Department of Education has collected and maintained placement and follow-up information on graduates of high schools, district vocational programs, community colleges, and state universities. The FETPIP annually links educational attainment information to wage data for the purpose of measuring graduates’ success. Unlike conventional survey data collection through sampling, the automated FETPIP system provides aggregated outcomes in a more accurate, timely, and cost-effective manner.

The following diagram (Figure 22) shows FETPIP participants and follow-up resource agencies:

Relevant strengths and limitations of FETPIP data are noted as follows:

Strengths of FETPIP Data:

- FETPIP data provides aggregated outcomes in an accurate and timely manner. This automated system collects, maintains, and disseminates placement and follow-up information on high schools, state university system institutions, community colleges, and postsecondary education (PSE) vocational program graduates.
- FETPIP provides more extensive information on graduates than any other survey. An alternative dataset, Census PUMS, includes demographic and occupational data but not educational information.
- FETPIP uniquely follows-up on high school graduates in vocational education programs studying at community colleges and in the state university system and the impact of such programs on their earnings over time.

Limitations of FETPIP Data:

- FETPIP data does not cover persons employed outside Florida by the private sector. However, it does cover federal employees who reside in other states.
- The data set does not have hourly wages for employees. However, it has quarterly wages for the graduates. Four quarter wages in a given year are aggregated to obtain annual wages.
- FETPIP data does not include specific occupations.

Tracking Florida High School Graduates from 1994

Through the use of FETPIP data, Florida TaxWatch was able to track the educational paths and individual earnings of 42,060 high school graduates from the 1993–94 school year. This represents a phenomenal number of cases, much higher than the traditional sampling methods.

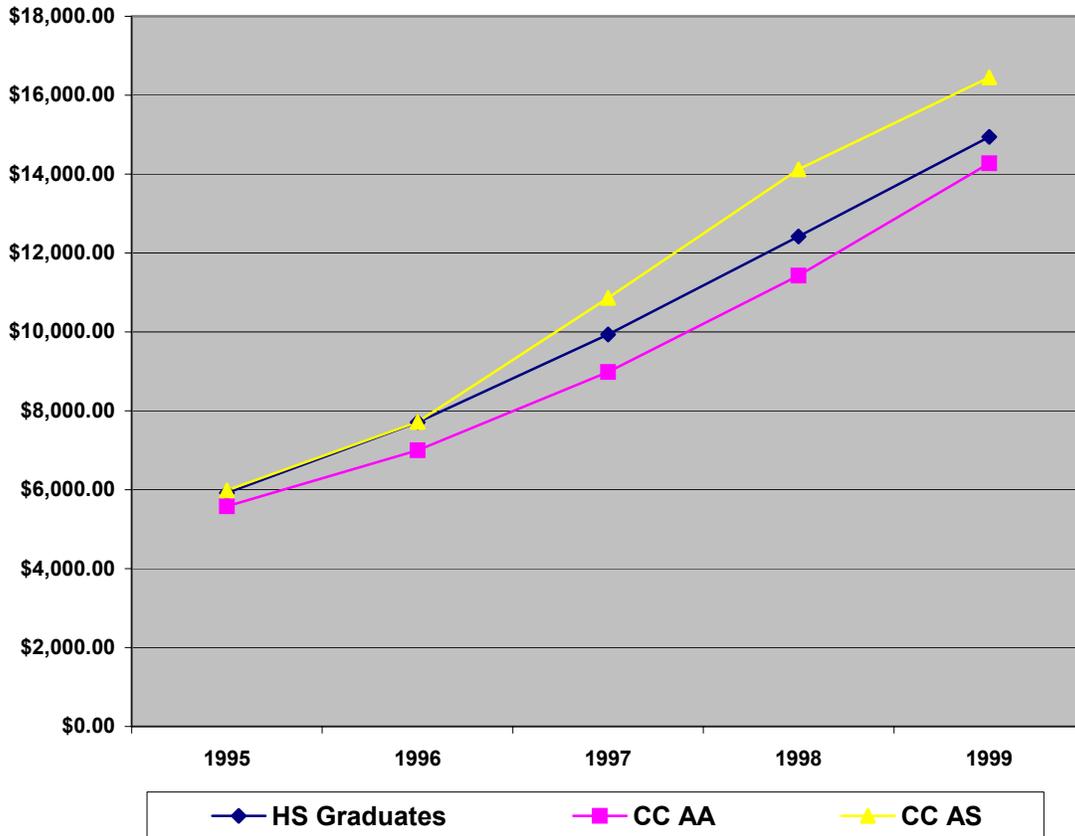
Tracking Education and Earnings of 1994 Florida High School Graduates from 1995–1999 (Figure 23)

As previously discussed, education has been found to be the most important determinant of earnings. Using the base group of 1994 high school graduates, this study began by looking at earnings from 1995–1999, their first four years out of high school and peak years for postsecondary education. This initial examination explored the earnings for three specific groups relative to their highest degree earned to date: high school graduates, community college Associate in Arts (AA), and community college Associate in Science (AS)/ Applied Science (AAS).

Figure 23 presents annual earnings comparisons for different educational levels between 1995 and 1999. As expected, high school graduates who did not pursue higher education made more money cumulatively because they spent more time in the workforce while

other high school graduates were spending time in school. This figure also indicates that community college graduates with AS/AAS degrees had higher incomes than those who earned AA degrees. It is theorized that the main reason for this disparity is that AS/AAS degrees are career-specific while AA degrees prepare students for baccalaureate studies.

Figure 23. Annual Average Full-Time and Part-Time Earnings for High School and Community College Graduates (1995–1999)

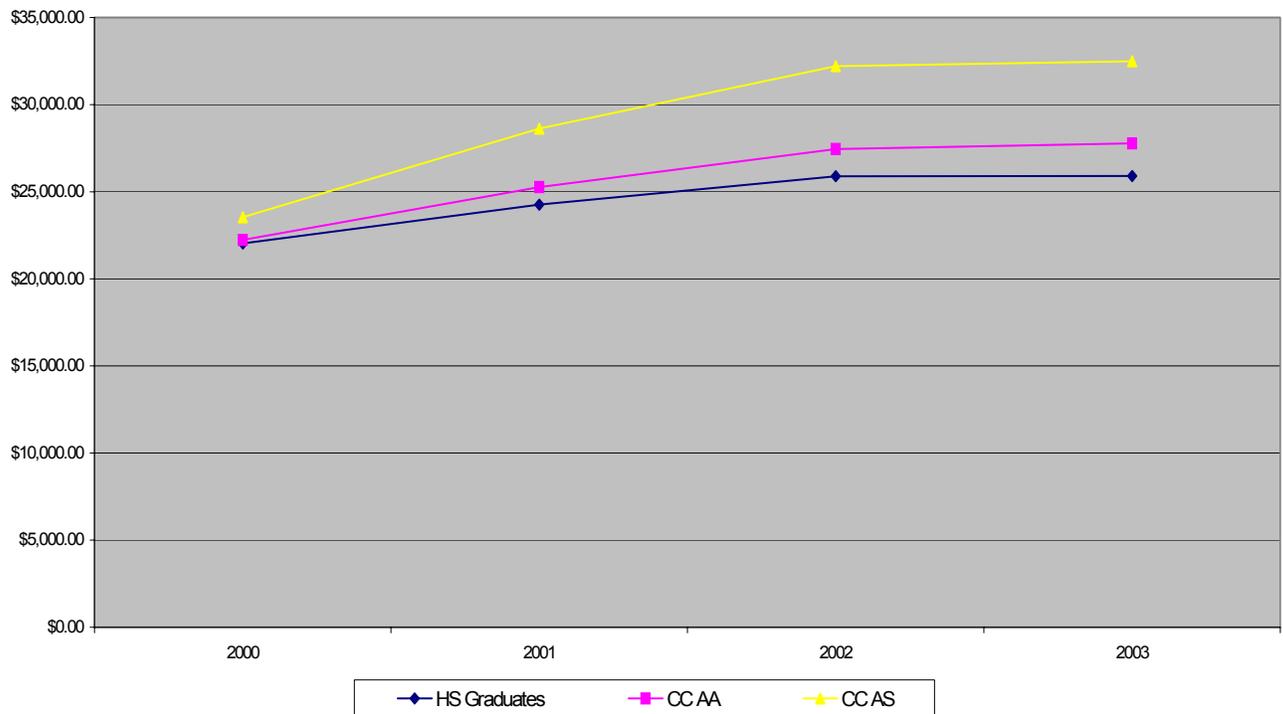


Tracking Education and Earnings of 1994 Florida High School Graduates from 2000–2003 (Figure 24)

Figure 24 compares earnings for the years 2000–2003. Based on the assumption that most of the 1993–1994 high school graduates captured in this study received their final degrees and had full-time jobs by 2000, only full-time annual earnings were included. This study borrowed FETPIP’s assumption that those who made more than the minimum wage had full-time jobs. The figure indicates, as expected, that annual average earnings for those with AS/AAS degrees were the highest, at above \$33,000 by 2003, followed by those with AA degrees (approximately \$27,000) and those with high school degrees (approximately \$26,000). While earnings of high school graduates plateaued during

2000–2003, earnings for other graduates increased. Finally, it was interesting to note that there was a small earnings gap between those with AA and high school degrees.

Figure 24. Annual Average Full-Time Earnings for High School and Community College Graduates (2000–2003)



Lifetime Earnings Comparison – An Explanation

The skills and knowledge possessed by an individual can be defined as human capital. All individuals attain a certain amount of human capital – which is primarily influenced by education and training. Investment in human capital increases productivity. The skills embodied in a person are “rented out” to employers. The higher the level of skill a person has, the higher this “rent” is likely to be. Thus, the expected return on investment in one’s human capital is a higher level of earnings and greater job satisfaction. Blaug (1972) summarized the link between education and earnings by stating that

“the simplest explanation of the universal association between education and earnings across sectors, industries and occupational categories around the world is that the better educated are generally more flexible and more motivated, adapt themselves more easily to changing circumstances, benefit more from work

experience and training, act with greater initiative in problem-solving situations, assume supervisory responsibility more quickly and, in short, are more productive than the less educated, even when their education has taught them no specific skills.”

By comparing the costs and benefits of an educational investment, we are able to draw conclusions as to the profitability of investing in education. Consider a simple model of human capital. Assume that a high school graduate is trying to determine whether to go to college. There are three general types of costs: “direct,” which include tuition, fees, books, and supplies; “indirect,” which include foregoing earnings by not entering the labor market after high school; and physical costs of studying and being tested. These costs must be compared to the economic benefits of investing in education to increase the flow of future earnings. It is important to note that future benefits are worth less to us than the same benefits received today for two reasons. First, people prefer consumption today to consumption tomorrow because uncertainties make future enjoyment difficult to perceive. Second, interest can be earned by investing monetary benefits rather than using them for consumption. It is therefore necessary that the net present value (NPV)—i.e. the discounted value of a financial sum arising at some future period—of the present and future costs and benefits of a college education be determined as they accrue at different points in time.²

Someone whose education does not go beyond high school and who works full-time can expect to earn about \$1.2 million between ages 25 and 64, a typical work-life period, according to demographers. Graduating from college and earning advanced degrees translates into much higher lifetime earnings: an estimated \$2.1 million for college graduates; \$2.5 million for those with a master’s degree; and \$4.4 million for doctors, lawyers, and others with professional degrees. Countless empirical studies that have estimated return on investment in human capital show a general consensus that the rate of return (ROR) to an individual of a college education is between 5% and 15% above that of a non-college graduate.

Lifetime Earnings Comparisons for 1994 Florida High School Graduates (Figure 25)

Figure 25 shows FETPIP data on age by income level distribution. Because the majority of students from the 1993–1994 high school graduating class were between the ages of 25 and 29, it was necessary to correlate FETPIP income data on community college and state university system graduates with income percentages from a standard lifetime earnings table obtained from a recent U.S. Census Bureau publication.³

Those state university system bachelor’s degree graduates with no community college background earned \$2.12 million over their working lifetime while those with a community college/state university system background and a bachelor’s degree earned

² Andrus Florides, as excerpted from: Blaug, M. (1972): *Introduction to the Economics of Education* Harmondsworth, London. <http://www.maths.tcd.ie/local/JUNK/econrev/ser/html/hkap2.html>

³ U.S. Census Bureau. *The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings*. <http://www.census.gov/prod/2002pubs/p23-210.pdf>

\$1.82 million. Community college graduates with an AS/AAS degree earned \$260,000 more than community college graduates with an AA degree. High school graduates can expect to generate \$1.35 million in lifetime earnings.

Figure 25. Expected Total Lifetime Earnings Among Full-Time Employed Floridians by Highest Degree Earned



Florida Community College REMI Direct and Indirect Economic Impact Analysis Results⁴

The net economic stimulus from community colleges is estimated by examining additional lifetime earnings of community college graduates resulting from a community college education.

The definition of community college economic impact is the difference between existing 2003 Florida economic activity and the *drop* in the level of economic activity that would occur if earnings from community college-educated graduates did not exist. The difference between Florida economic activity that includes the lifetime earnings from 2003 community college graduates (measured by the difference in earnings of these community college-educated workers and earnings from workers with a high school education) and economic activity that excludes these earnings represents the direct measure of community college contributions to Florida’s economy.

⁴ Please read the appendix for detailed information about the REMI model.

Entering these higher earnings into the Florida region-specific REMI (input-output) model, we were able to measure the direct and indirect present value of community college graduates' earnings across the Florida economy over time. The measured economic impacts include community college related increases in:

- Florida Gross Domestic Product (or State Output)
- Personal Income (Including Wages)
- Number of Jobs Created

Total economic impact of community college 2003 graduate lifetime earnings on the state economy includes direct, induced, and indirect economic impacts resulting from spending by those graduates. The induced effects are the economic effects resulting from the “re-spending” of wages, that is, new employees having money to spend as a result of community college education. The indirect effects include induced plus intermediate impacts that result from the purchase of intermediate goods.

Table 2 shows the economic impacts on employment, gross state product (GSP), and personal income (additional lifetime earnings resulting from a community college education). State output is the dollar value of final goods and services produced across the Florida economy over the FY 2003–FY 2043 time period.

State Output between 2003 and 2043 is projected to increase by \$13.6 billion from 2003 community college graduates' higher lifetime earnings. This community college-generated rise in state output will create considerable direct and indirect increases in employment as well. The table below indicates that 102,768 Florida jobs will be created over the 40 years of this analysis from community college graduates' spending alone. In turn, this employment increase will generate higher wage and salary earnings. Direct and indirect personal (or disposable) incomes over this period will increase by \$5.5 billion.

Table 2. Summary of Lifetime Earnings Results for Community Colleges in Florida

Net Present Value of GSP or State Output	\$13.6 billion
Net Present Value of Wages	\$5.5 billion
Number of Jobs	102,768

Internal Rate of Return (IRR) Analysis

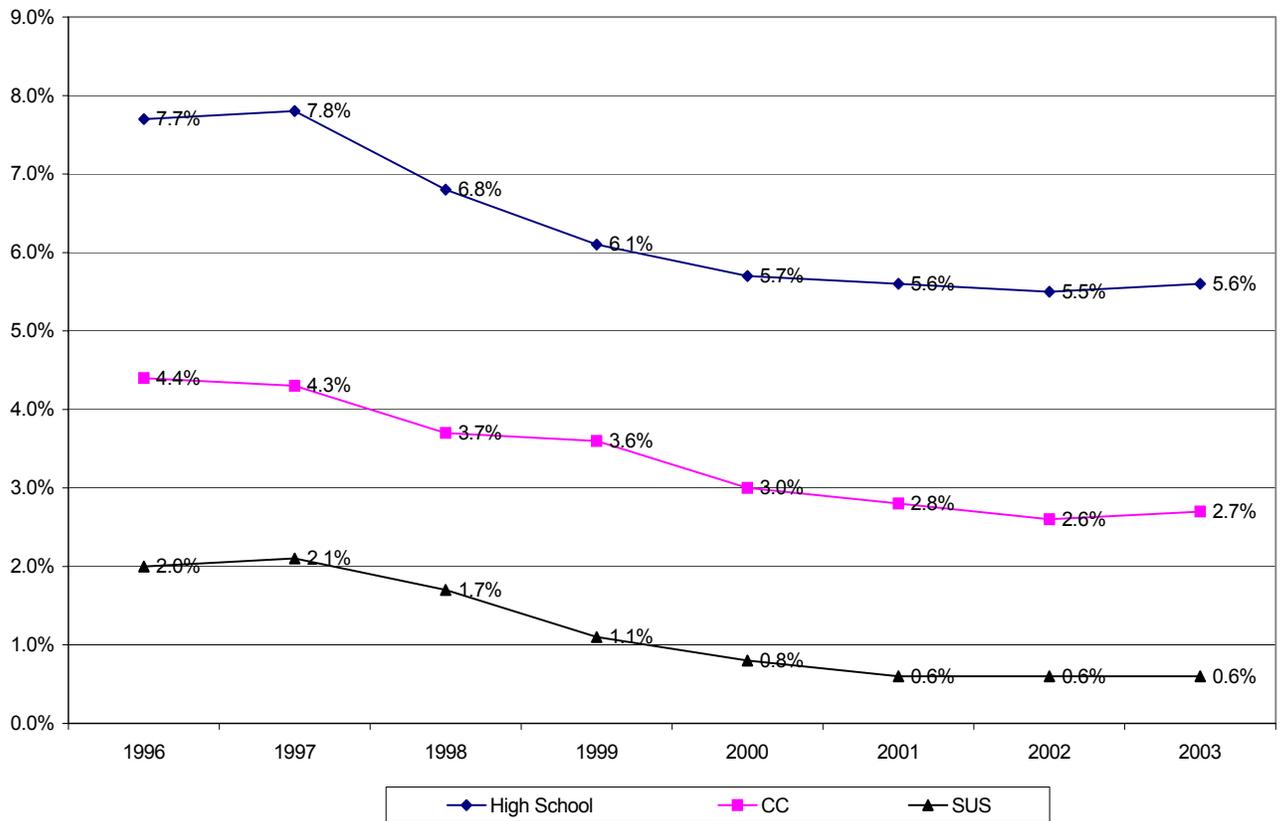
Section 1004.58, Florida Statutes, discusses the need to address the “return on the state’s investment in research conducted by public postsecondary institutions.” A focus of this assessment is on community colleges. Internal rate of return analysis involves the time value of money to isolate “profitability” of investing in community colleges. If the internal rate of return is more than the cost of borrowing used to fund a project, it will be a positive cash flow investment, exceeding the alternative of investing the money in the bank.

The REMI model was used to estimate the return of public support funding (general revenue, lottery funds, and local funding) for Florida community colleges for FY 2002–03. Lifetime earnings represented the cash flow stream of additional earnings based on community college and community college/state university system diplomas for a 40-year interval. The ratio of output to lifetime earnings was calculated and used to generate output over this period. **The internal rate of return was equal to a substantive 33.9%.**

Social Savings to Florida from Community College Impact

Figure 26 shows 1993–1994 high school graduates who received foodstamps in 2003. Approximately 6% of the 1993–1994 high school graduating class received foodstamps in 2003. Of those completing a community college education, 2.7% were foodstamp recipients, as compared to 0.6% of the state university system graduates. As individuals increase their years of higher education, the need for welfare assistance decreases.

Figure 26. Foodstamp Recipients Among High School, Community College, and State University System Graduates



Conclusion

Education has a direct and powerful influence on the way of life for all citizens of the state. A highly-skilled workforce is imperative to the state's economic viability. Florida's ability to attract high skilled jobs impacts the business climate and the standard of living. Labor-force quality is directly related to economic growth, and education is the strongest proven influence on the quality of the labor force.⁵ Quality education provides returns to economic development through improved productivity, increased labor pools, learned skills, technology, and workers' average earnings. On the other hand, a poorly educated workforce—characterized by unemployment and low-wage jobs—hinders economic progress.

As the data in this report indicate, Florida's community colleges have provided an impressive return on investment to the state and have contributed much to the quality of life for Florida's citizens. However, the landscape of Florida postsecondary education continues to change, and the demands placed on the system continue to escalate.

Through 2010, eight of the top ten fastest growing jobs in Florida will require an associate's degree or a postsecondary vocational certificate.⁶

Community colleges are uniquely poised to maneuver Florida's changing educational landscape to meet such challenges and to provide and enhance the learning opportunities that will contribute to the future of Florida's economic development. For example, state and national emphases on K-12 educational accountability have highlighted an unprecedented need for more quality teachers. Florida's class size reduction and voluntary pre-kindergarten constitutional mandates will exacerbate this need. Florida's community colleges have implemented Educator Preparation Institutes that will help to address the teacher shortage.⁷

The Florida TaxWatch Center for Educational Performance and Accountability (CEPA) recommends that further research be undertaken that will show how best to capitalize on the strengths of Florida's community college system to meet current and future challenges. Among the questions to be answered are:

- Which AS/AAS degree programs are most in demand and which contribute the most return on investment?
- How well informed are students regarding these career options?

⁵*Schooling, Labor-Force Quality, and the Growth of Nations*. The American Economic Review 2000, Hanushek, E. and Kimko, D.

⁶ Florida Labor Market Statistics, retrieved from <http://www.labormarketinfo.com/library/ep/p12sw00.xls>, on July 5, 2005.

⁷ Florida TaxWatch, *Educator Preparation Institutes at Florida Community Colleges Will Help Prevent Severe Teacher Shortage*, April 2005.

- What changes, if any, are needed in the way that Florida funds postsecondary education, including workforce education?
- Have recent increases in college and university tuition threatened the accessibility of postsecondary education to all Floridians?

It is ultimately a state's responsibility to assure the effective and efficient operation of its educational system. An emerging emphasis on postsecondary institutional accountability will require that other questions be answered as well.

- What improvements need to be made to the FETPIP data collection and dissemination system to inform decision-makers and foster accountability for taxpayer dollars?
- A recent report by the Office of Program Policy Analysis and Government Accountability (OPPAGA) raises the issue of excess hours taken by students at community colleges.⁸ How can such questions be addressed given the unique nature of community college students and programs?

Florida's seamless K-20 educational governance system positions the state to engage in collaborative efforts that span the traditional boundaries of intermediate, secondary, and postsecondary education.

- How can community colleges leverage these opportunities for collaborative efforts in ways that will benefit not only students, but also the state? As this report indicates, students who complete an AS/AAS degree earn more than students who complete only an AA degree—the traditional college path. Can community colleges play a role in reducing the high school dropout rate by offering exciting educational alternatives to engage students who do not wish to take the traditional college path?
- How can community colleges contribute to middle- and high-school reform efforts?

As community colleges grapple with the questions of how best to serve the needs of the state and its citizens, Florida TaxWatch encourages the system's leadership to engage in thoughtful reflection and planning regarding Florida's future and the community colleges' role in that future.

⁸ *Excess Hours at community Colleges Warrant Attention by the Department of Education and the Legislature*, April 2005, Report No. 05-30.

APPENDIX: RESEARCH NOTE ON THE REMI MODEL

Determining the Economic Impact of Community Colleges on the State of Florida

The determination of the economic impact to the state of Florida by local community colleges was made using commonly accepted scientific research formulas and protocols. These included the Regional Economic Model, Inc. of 2000 (REMI, 2000). REMI, 2000 is a widely accepted dynamic integrated input-output and econometric model that is used to measure proposed legislative and other program and policy economic impacts across the private and public sectors of the state by the Florida Joint Legislative Management Committee, Division of Economic & Demographic Research; the Florida Agency For Workforce Innovation; other state and local government agencies; and universities and private research groups that evaluate economic impacts across the state and nation.

The REMI model used for this analysis was specifically developed for the state of Florida and includes 172 sectors. REMI's principal advantage is that it forecasts both direct and indirect economic effects over multiple years. Other input-output models are used primarily for single year analyses.

REMI Model Economic Impact Analysis

One section describes the impact of community colleges on Florida's economy by measuring increases in employment and economic output that they generate. The net economic stimulus from community colleges is estimated by examining actual revenues spent on community colleges, including state support, student fees, and lottery funds.

The definition of community college economic impact is the difference between existing economic activity in Florida and the level of economic activity that would exist in the absence of community colleges. Because community colleges already exist, their impact on the state economy was measured by first removing them from the economy. The difference between the economy with community colleges and the economy without community colleges represents the net community college economic impact. The REMI captures the net economic impact of community colleges on the state of Florida. Economic impacts include increases in:

- 1) Florida gross regional product (or state output)
- 2) Personal income (including wages)
- 3) Number of jobs created

Short-term economic impacts are the net changes in regional output, earnings, and employment that are due to new dollars entering into a region from a given enterprise or economic event. In this study, the enterprise is the community colleges and the region is Florida. Effects of expenditures external to Florida (termed leakages) are not included in the impact estimates.

Methodology

As a part of our modeling strategy, we examined the revenue approach regarding the impact of community colleges on the Florida economy. The revenue approach allows the REMI model to redistribute expenditures according to sectors based on historical data.

REMI uses three sources of employment, wage, and salary data: the Federal Bureau of Economic Analysis (BEA) employment, wage, and personal income series; Covered Employment and Wages (ES-202) employment, wage, and salary data; and County Business Patterns (CBP) data published by the U.S. Bureau of the Census. The BEA data are annual averages and are reported at the two-digit level for states and at the one-digit level for counties. ES-202 data, which is the foundation for BEA data, are collected monthly in conjunction with the unemployment insurance program at the two-digit level for counties and states. CBP data are collected annually in conjunction with the social security program.

Confidentiality requirements produce some suppression in the data. Where suppressions occur, the number of establishments and the range of employees for each establishment are supplied by CBP. REMI fills in the suppressions based on the hierarchical structure of the BEA data within regions and within industries. First, all two-digit standard industrial classifications (S.I.C.s or industries) are made consistent within the corresponding one-digit industries for each state simultaneously with all two-digit industries summed to the major region two-digit totals. Second, for counties the REMI uses ES-202 data, if available, and CBP data if not available. Whichever data set is selected, it is made consistent with BEA one-digit county totals and state two-digit totals.

Output measures are based on regional employment data, the BEA gross state product series, and national output-to-employment ratios. REMI begins by applying the national output-to-employee ratio to employment by industry. This application is adjusted by regional differences in labor intensity and total factor productivity. Regional differences in labor intensity are given by industry production function and unit factor costs. Total factor productivity calculations depend on industry value added in production reported in real U.S. dollars by BEA, and on adjustments by REMI to BEA numbers to reflect differences in regional production costs. The ratio of real regional value added per unit of input relative to U.S. value added per unit of input is the REMI relative total factor productivity.

Model Assumptions

This report provides estimates of only direct, pecuniary/financial benefits (or “return”) generated for the state (income, employment, taxes) as a result of “investments” that the state makes in community colleges via state-appropriated and lottery-appropriated funds. This analysis ***excludes*** “*non-pecuniary/non-market*” or “*intangible*” benefits such as those associated with teaching, research, and public service activities of community colleges. Therefore, assumptions used in this report to estimate the economic return to the state through its investments in community colleges can be characterized as conservative. It is important to recognize, nonetheless, that benefits to the state of Florida associated with community college-produced intangibles (e.g., the value of new medications or high

tech products taken to market, quality of life enhancements, teaching, research, publications, presentations, public service, and a host of other cultural and amenity values) are significant. The amenity value or benefits to a community with a research university (and enhanced by multi-faceted activities of community colleges) can also be significant.

The REMI model's assumptions and operational components are:

- 1) A constant rate of growth for the state's economy;
- 2) Actual FY 2001 community college state support, student fees, and lottery revenues;
- 3) A total state investment (revenues) in FY 2001 of \$850 million;
- 4) In their absence, the community college investment (\$850 million) would have been reallocated to other Florida higher educational activities; and
- 5) REMI results expressed in terms of impacts on gross regional product (GRP), employment, personal disposable income, and state tax revenues.

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www.floridataxwatch.org where this Research Report was initially released before being printed in hardcopy format.

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Michael Jennings, Chairman; Dominic M. Calabro, President and Publisher

<http://www.floridataxwatch.org>

Florida TaxWatch acknowledges the support of Florida Association of Community Colleges in the publication of this report.

The work of the Florida TaxWatch Center for Educational Performance and Accountability has been made possible, in part, through the generous contributions of Publix Super Markets Charities, Inc., the Washington Mutual Foundation, Sprint, IBM, Best Practices Network, Darden Restaurants Foundation, Progress Energy Foundation, Wachovia Foundation, and the State Farm Companies.

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Florida TaxWatch's Center for Educational Performance and Accountability (CEPA) was formed in acknowledgement of two key realities: the growing portion of education funding in the state budget, currently at 28% and climbing, and of the profound fiscal and economic impact that quality PreK-20 education has on Florida's competitiveness, both nationally and internationally. CEPA conducts research, issues publications, and engages in meaningful actions to promote exemplary student achievement within a cost effective environment. CEPA analyzes and makes recommendations about educational policies, practices, and expenditures as regards their contributions to improved financial and student performance in Florida's schools. CEPA also identifies specific educational issues that affect the efficiency, effectiveness, and accountability of state government, local school districts, and postsecondary institutions. Finally, CEPA brings together partnerships and collaborations in a concentrated effort to effect positive and dynamic change in Florida's system of PreK-20 education.

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Florida TaxWatch's research recommends productivity enhancements and explains the statewide impact of economic and tax and spend policies and practices on citizens and businesses. Florida TaxWatch has worked diligently and effectively to help state government shape responsible fiscal and public policy that adds value and benefit to taxpayers.

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