6.2.2011

# The Contributions of Career Colleges to the Kentucky Economy

Kentucky's career colleges make significant contributions to the economy and the workforce in the state. In addition, career colleges provide a higher return on investment for taxpayers than public institutions.

Prepared for

**Kentucky Association of Career Colleges and Schools**
**PO Box 99367**
**Louisville, KY 40269-0367**


**Richmond, Virginia**

**1309 East Cary Street**
Richmond, Virginia 23219
804.649.1107 (phone)
804.644.2828 (fax)

**Cleveland, Ohio**

**1025 East Huron Road**
Cleveland, Ohio 44115
216.357.4730 (phone)
216.357.4730 (fax)

CHMURA ECONOMICS & ANALYTICS

## Table of Contents

# 1. Executive Summary

Private career colleges are playing an increasingly important role in the postsecondary education both in Kentucky and the nation. Their mission-critical approach is to educate toward employability. Their outcome-driven agenda begins with the end in mind for their students: taking the knowledge, skills, and abilities embodied in each student and raising those attributes to a level that matches what employers require of their new hires. The objective of this report is to identify the benefits career colleges represent to Kentucky.[1]

Various factors have contributed to the rapid growth of Kentucky's career colleges and make them an attractive option in the higher education marketplace. Kentucky career colleges attract a higher percentage of low-income, minority, and adult students who are underserved by traditional 2-year and 4-year colleges and universities. They offer a practical curriculum focused on demand occupations in healthcare and business, which increases their appeal. Their schedules are flexible including nights and weekends, which can attract working adults seeking lifelong learning opportunities. Moreover, career colleges are pioneers in offering online education portals that provide additional flexibility for students. By focusing training in high-demand occupations, career colleges are graduating students prepared to enter fields directly contributing to Kentucky's workforce needs. Also, unlike public and non-profit colleges, which are subsidized by state funds or do not have to pay taxes, career colleges contribute immediately to the viability of the Commonwealth of Kentucky by paying taxes.

### *In Kentucky, 56 of the 107 postsecondary institutions in the 2009-2010 academic year were career colleges and universities.*

Among the career colleges, 42 schools were 2-year colleges, and 12 were 4-year colleges. There were two which offered certificate programs that take less than two years to complete. The career colleges in Kentucky serve all parts of the state. Of the 56 career colleges in Kentucky, 17 were located in the Louisville metropolitan statistical area (MSA), 9 were located in the Lexington MSA, and 7 were located in the Cincinnati-Middleton MSA. Together, these three regions accounted for close to 60% of the career colleges in Kentucky.

### *Kentucky's career colleges deploy wide-sweeping technologies across their campuses.*

Career colleges in Kentucky have invested heavily in technologies to provide a real-world education to their students that is both academically sound and state-of-the-art. This learning environment reduces the learning curve for students once they are employed. According to recent surveys, Kentucky career college students benefit from assets such as classrooms equipped with projectors, white boards, and computer equipment; a fully equipped medical assisting lab; nursing labs with "Sim Man," a patient simulator; and a fully-equipped physical fitness lab for a Personal Trainer program.

### *Kentucky's career colleges offer a wide range of academic programs with the largest focus on the disciplines of healthcare, business, and personal and culinary services.*

Healthcare, business, and personal and culinary services occupations are in strong demand in the Commonwealth; these three program groups accounted for 41%, 21%, and 20%, respectively, of career college awards in the 2009-

[1] A variety of methods were used to identify the contributions Kentucky's career colleges make to the Commonwealth, including data collection from government sources and a survey of Kentucky's career colleges.

2010 academic year. In the same year, 87% of career college awards in the state were at the certificate and associate's degree level, 9% were at the bachelor's degree level, and 4% were graduate degrees.

### *Kentucky's career college enrollment is growing much faster than at other postsecondary institutions.*

One of the most significant developments in American higher education in the past decade is the phenomenal growth of non-traditional colleges and universities. This indicates that the increasing demand for higher education in the United States is being met by the private career colleges and not by public institutions. In the Fall 2009 term, 26,141 students enrolled in Kentucky's postsecondary institutions were attending career colleges, accounting for 9.1% of all Kentucky postsecondary students. Enrollment in Kentucky's career colleges grew 11.6% per year from 2000 to 2009. In contrast, enrollment in community colleges grew 6.3% per year while enrollment at 4-year public colleges grew 1.8% per year.

### *Kentucky's career colleges are more cost effective in educating students than subsidized public education.*

Public 4-year institutions and community colleges are able to offer lower tuition rates for Kentucky residents because they receive more funding from the state government. In the 2009-2010 academic year, average tuition at career colleges ($12,762 per year) was higher than at community colleges ($2,996 per year) and public 4-year institutions[2] ($6,855 per year) based on the in-state tuition rate, and it was generally lower than not-for-profit private colleges. However, the annual average state appropriation per in-state student for public colleges was $1,665 for 2-year colleges and $8,672 for 4-year colleges during the same year, making it possible for public colleges to offer substantially lower tuition rates to the students. This is in comparison to the $153 of state appropriations per career college student in that same time frame. The public 4-year out-of-state tuition rates ($16,410) are a fairer comparison with that of Kentucky's career colleges, as they reflect the cost of educating students without state subsidies.

### *Kentucky's career colleges serve a unique, non-traditional student population who are underserved in traditional universities and colleges.*

Based on Fall 2009 enrollment data, 70.7% of all students enrolled in Kentucky's career colleges were female. Defining adult students as those over 25 years of age, 65.4% of students at career colleges were adult students in Fall 2009, more than double the 37% in public colleges. Based on national 2007-2008 academic year data for non-independent students, 21.7% of career-college students came from families with household incomes less than $20,000, compared with only 10.0% for public 4-year institutions and 14.3% for public 2-year colleges.

### *Students in Kentucky's career colleges rely more on federal grants and student loans to finance their education, in part, due to the unique demographic mix of the students.*

Based on 2009-2010 academic year data, a majority (72.3%) of students in Kentucky's career colleges took student loans compared to 29.4% for community colleges and 49.3% for state public four-year colleges. Students in Kentucky's career colleges and institutions received significantly less aid from state or local governments.

---

[2] Fees are not included in this figure.

### *Career colleges provide access to minority students who are under-represented in Kentucky's public schools.*

Kentucky's career colleges fill an important niche by providing access to higher education for underserved minority students, especially African American students. Only 54.7% of the students in career colleges were white in Fall 2009 compared to over 80% of those in Kentucky's public colleges.

### *Graduates of Kentucky's career colleges achieve success in the labor market.*

Based on survey results obtained during April of 2011, almost 70% of graduates from Kentucky's career colleges obtained employment within six months of graduation.

### *Kentucky's career colleges are very responsive to business needs and many have state-of-the-art facilities and technology infrastructure.*

Most career colleges have established industry advisory boards for their programs and use feedback from these boards to adjust programs to meet changing business needs. Kentucky's career colleges also have invested significantly to provide their students with state-of-the-art technologies and facilities, so that students can develop skills to meet the challenges of today's workplace.

### *Kentucky's career colleges are a vital component of meeting Kentucky's specific workforce needs.*

Based on a degree-awards-by-occupation analysis, career colleges accounted for 11% of the postsecondary training impact in Kentucky during the 2009-2010 academic year. Moreover, career colleges accounted for 12% of STEM[3]-related degree awards in the state during the same year. Of the top fifteen STEM occupations trained by Kentucky's career colleges, eleven rely on career colleges for at least a third of new postsecondary graduates. For many in-demand occupations, career colleges provided a majority of the training. **Career colleges trained 55% of the medical assistants, 89% of the electrical and electronic engineering technicians, and 85% of the pharmacy technicians entering the workforce.**

### *Career Colleges support more than 4,000 jobs in Kentucky, generating economic impacts of $464.4 million in academic year 2009-10.*

In academic year 2009-10, the total revenue for all career colleges reached $267.9 million. All career colleges in Kentucky employed 3,125 faculty and staff members for the 2009-10 academic year. The annual capital expenditure of all career colleges is estimated to have been $7.0 million.

The economic impacts come from their ongoing operation ($454.1 million per year) and capital expenditure ($10.3 million per year). Combined, the annual economic impacts of Kentucky career colleges are estimated to be $464.4

---

[3] STEM stands for science, technology, engineering, and mathematics. The definition for STEM occupations used here was developed by Barroilhet and Udalova. It can be found at: www.stemequitypipeline.org/_documents/FINAL_LIST_OF_STEM.xls.

million (including direct, indirect, and induced), which can support 4,232 jobs for the 2009-10 academic year in the state.

### *The average return on investment (ROI) for students receiving a 2-year degree from a career college is 5.2% per year during their working life and 6.0% for those receiving a 4-year degree.*

Student ROI[4] measures the increased earning power of college graduates with regard to the cost of a college education. The ROI is based on the average tuition, loans, and income after graduation for two-year and four-year students. In light of the state subsidies received by public institutions, the ROI for students attending public colleges and universities is somewhat higher than that for career colleges.

### *Kentucky's career colleges receive much less taxpayer support compared with public institutions.*

Total taxpayer support includes costs incurred by both state and federal taxpayers. On a per-enrolled student basis, taxpayer subsidies were $3,026 for 2-year career colleges and $5,130 for public community colleges in the 2009-2010 academic year. For 4-year institutions, taxpayer subsidies were $2,729 for career colleges and $12,075 for public colleges. Taxpayer expenses for career colleges are only a fraction of what is spent on public colleges. For each college graduate in Kentucky, taxpayer expenses for career colleges are a mere 23.9% of that for community colleges and 17.3% of that for 4-year institutions.

### *Kentucky Career Colleges make a significant financial contribution to the viability of the Commonwealth.*

Career colleges generated $10.8 million in tax revenues for the state government for the 2009-10 academic year. Meanwhile, on a per enrolled student basis, tax payers spend significantly less on career college students than public college students..

### *Taxpayer ROI is much higher for Kentucky's career colleges than for public institutions.*

Taxpayer ROI measures increased tax revenues with respect to taxpayer expenses in higher education. For Kentucky's 2-year career institutions, the ROI for taxpayers is estimated to be 5.3% per year. For 4-year career institutions, the ROI for taxpayers is 6.3% per year. Those rates are significantly higher than for the respective public institutions, for which ROI stands at 2.2% for community colleges and 2.4% for 4-year colleges.

---

[4] Students' lifetime return on investment (ROI) takes into account the expected wages in their post-college occupations, the cost of education and training, and the education completion time.

# 2. Background

Private career colleges are playing an increasingly important role in postsecondary education in Kentucky and the nation. According to the Career College Association, 41% of all national Title IV participating higher education institutions[5] were career colleges in the 2007-2008 academic year, and they enrolled 1.2 million students in Fall 2007 compared to 13.5 million in public colleges. National enrollment in career colleges has grown dramatically in recent years. Over the five years ending with the 2007-2008 academic year, enrollment in career colleges nationally increased 41%[6] while academic awards from career colleges increased 48%.

The history of private career colleges can be traced to the early years of the nation. For example, business skills, penmanship, and bookkeeping were taught in private schools and apprenticeship programs. After World War II, with the expanding economy and increased technological requirements for workers, apprenticeship programs began to fall short in supplying the workforce needs of businesses. As a result, more formal career colleges and schools expanded to meet demand for skilled labor.

One significant development in the growth of career colleges was the 1972 Higher Education Act, which provided students in private career schools with full and equal participation in federal student loan programs.[7] While many private career colleges in the 1960s and 1970s offered short-term certificate programs (focusing on practical skills development), many of today's private career colleges offer a full suite of associate's, bachelor's, and graduate degrees. As a result, private career colleges are competing directly with public 2-year and 4-year colleges and with private nonprofit colleges and universities.

The Kentucky Association of Career College Schools (KACCS) is a nonprofit association to promote the interests of the career colleges and schools in Kentucky. KACCS contracted Chmura Economics & Analytics (Chmura) to better understand the current contributions that career colleges make to the Kentucky economy. A variety of methods are used in this study to identify the contributions of career colleges to the Commonwealth, including data collection from government sources and a survey of Kentucky's career colleges.

The remainder of this report is organized as follows:

- Section 3 provides a profile of Kentucky's career colleges, including size, geographic distributions, and program offerings. It also compares career colleges with Kentucky's 2-year and 4-year public colleges and universities on several quality indicators such as admission and graduation rates.
- Section 4 presents a profile of students enrolled in Kentucky's career colleges, highlighting the role of career colleges in providing educational access to low-income, minority, and working-adult students.
- Section 5 highlights the role career colleges play in workforce development, especially in providing training for occupations most needed by the business community.
- Section 6 estimates the economic and fiscal benefits of career colleges in Kentucky, both from their ongoing operation, as well as from their capital expenditures.
- Section 7 provides a return on investment (ROI) analysis summarizing the benefits of career colleges to students as well as to federal and Kentucky taxpayers.
- Section 8 offers a summary and conclusion.

---

[5] Title IV of the Higher Education Act of 1965 established the federal financial aid programs for students pursuing postsecondary education. In 2008, out of 6,747 Title IV participating institutions, 2,804 of them are career colleges.

[6] Source: 2009 Fact Book: A Profile of Career Colleges and Universities, http://www.imagine-america.org/05-fact-book.asp.

[7] Source: "Private Career Schools: An Objective Look," by John Lee and Jamie Merisotis, Career Training, March 1991.

# 3. Profile of Career Colleges in Kentucky

This section provides a profile of Kentucky's career colleges, including the number and location of the institutions, growth in enrollment, and curriculum. In addition, it provides other information such as admission rates, graduation rates, tuition, and financial aid. Finally, their state-of-the-art technologies, facilities, and flexible organizational structures that help them meet the ever-evolving needs of local businesses are also discussed.

## 3.1. Geographic Distribution of Schools

In the 2009-2010 academic year, 56 of the 107 postsecondary institutions (just over half of the higher education footprint) in Kentucky were career colleges and universities, according to the Integrated Postsecondary Education Data System (IPEDS) from the National Center for Education Statistics (NCES).[8] Among them, 2 were colleges offering certificate programs requiring less than 2 years to complete, 42 were 2-year colleges, and 12 were 4-year colleges.[9] Outside of the career college asset, there were 16 community colleges, 8 public 4-year colleges, and 27 other institutions (mostly private nonprofit postsecondary education institutions) in Kentucky in the 2009-2010 academic year.[10]

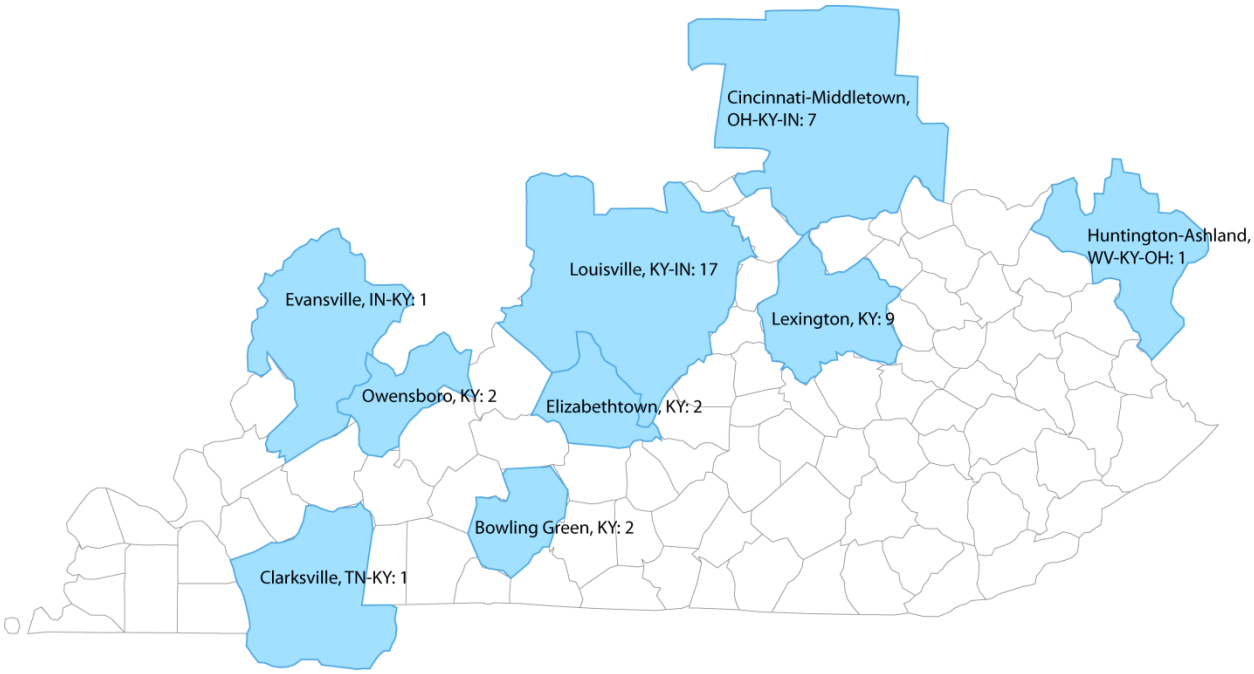
While career colleges serve all parts of the state, three regions stand out with the greatest number of career colleges (see Figure 3.1). Of the 56 career colleges in Kentucky in the 2009-2010 academic year, 17 were located in the Louisville metropolitan statistical area (MSA), 9 were located in the Lexington MSA, and 7 were located in the Cincinnati-Middleton MSA. Together, these three regions accounted for 59% of the career colleges in Kentucky.

[8] This number includes three Kentucky campuses of Strayer University. For some schools, IPEDS data do not represent the actual number of physical campuses in Kentucky. National College, for example, has six campuses in the state, but IPEDS lists only one campus (in Lexington).

[9] This classification is based on the highest level of degree awarded. For example, 2-year career colleges also offer certificates, and 4-year career colleges also offer associate's degrees and certificates.

[10] Appendix 1 provides a list and basic information of all career colleges in Kentucky.

**Figure 3.1: Location of Kentucky's Career Colleges (2009-2010 Academic Year)**




## 3.2. Curriculum Offerings of Career Colleges

Kentucky's career colleges offer a wide range of academic programs with degree awards ranging from certificates that take less than one year to complete to doctoral programs. As Table 3.1 shows, Kentucky's career colleges awarded 6,439 degrees or certificates in the 2009-2010 academic year. The most awards (by level) were certificates and associate's degrees making up 87% of all awards (5,602) in the 2009-2010 academic year. Vocational training includes skills such as hairstyling, massage, and culinary arts. Bachelor's or higher degrees are also important components of the privately capitalized and market-driven career colleges in Kentucky. In the 2009-2010 academic year, 9% of all awards (606) were at the bachelor's degree level and 4% (231) were for graduate degrees.

Kentucky's career colleges offer a wide range of fields of study, from liberal arts to engineering. Based on the Classification of Instructional Programs (CIP) at the two-digit level, Kentucky's career colleges are focused especially on three disciplines—healthcare, business, and personal and culinary services. These three program groups accounted for 41%, 21%, and 20%, respectively, of all awards in the 2009-2010 academic year. None of the other 2-digit program groups reached higher than 500 awards in that academic year.

An important strength of Kentucky's career colleges is their emphasis on training in high-demand occupations that enables their students to find jobs after graduation. From this perspective, it is not surprising that healthcare, business, and personal and culinary services are the primary focuses of their curriculum offerings. Section 5 provides an in-depth analysis on how Kentucky's career colleges contribute to workforce development in Kentucky.

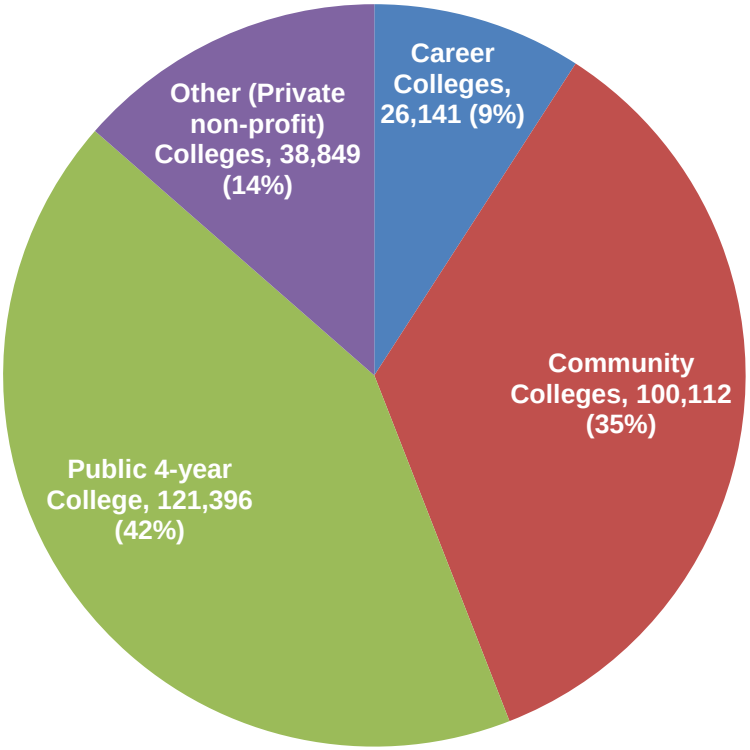
| Table 3.1: Academic Awards/Graduates Curriculums in Kentucky Career Colleges (2009-10) | Associate Degree and Certificates | Bachelors Degree | Post-Graduate Awards | Total |
|---|---|---|---|---|
| Communications technologies/technicians and support services | 11 | 9 | 1 | 21 |
| Computer and information science and support services | 371 | 32 | 6 | 409 |
| Personal and culinary services | 1,308 | 0 | 0 | 1,308 |
| Education | 4 | 0 | 9 | 13 |
| Engineering Technologies and engineering-related fields | 276 | 5 | 0 | 281 |
| Family and Consumer Sciences/Human Sciences | 14 | 0 | 0 | 14 |
| Legal Professions and Studies | 95 | 15 | 7 | 117 |
| Liberal arts and sciences, general studies, and humanities | 1 | 0 | 0 | 1 |
| Multi/Interdisciplinary Studies | 1 | 1 | 15 | 17 |
| Psychology | 0 | 1 | 0 | 1 |
| Homeland security, law enforcement, firefighting and related protective services | 142 | 11 | 0 | 153 |
| Public administration and social service professions | 0 | 0 | 6 | 6 |
| Social sciences | 0 | 0 | 0 | 0 |
| Mechanic and repair technologies/technicians | 9 | 0 | 0 | 9 |
| Visual and performing arts | 100 | 21 | 0 | 121 |
| Health professions and related programs | 2,627 | 0 | 8 | 2,635 |
| Business, management, marketing and related support services | 643 | 511 | 179 | 1,333 |
| **Total** | **5,602** | **606** | **231** | **6,439** |
| Source: IPEDS | | | | |

## 3.3. Total Enrollment and Growth

### 3.3.1. Total Enrollment

In the Fall 2009 term, 26,141 of the 286,498 students enrolled in Kentucky's postsecondary institutions were in career colleges, accounting for 9.1% of all Kentucky students. The enrollment size of career colleges was less than that of nonprofit colleges whose enrollment stood at 38,849. The majority of college students in Kentucky attend public colleges—either community colleges (100,112 in Fall 2009) or public 4-year institutions (121,396 in Fall 2009).

**Figure 3.2: Enrollment in Kentucky Post-secondary Institutions (Fall 2009)**




Source: IPEDS

Within Kentucky's career colleges, the dominant players are the 4-year colleges. Of the total 26,141 enrolled in career colleges (9% of the total enrolled students in the state), 61.6% of the students were in 4-year colleges, with 37.7% in 2-year colleges, and 0.7% in institutions that provide degrees that take less than two years. Many of the 4-year career colleges also award associate's degrees and certificates in addition to bachelor's or graduate degrees; as a result, they offer a wide range of options for students who may want a 2-year degree or certificates, but would like to continue to advance their education in the future.

### 3.3.2. Enrollment Growth

One of the most significant developments in American higher education in the past decade is the phenomenal growth of non-traditional colleges and universities. This indicates that the increasing demand for higher education in America is being met by the private career colleges and not by public institutions. From Fall 2000 to Fall 2009, total enrollment in Kentucky's career colleges grew from 9,748 to 26,141 or at an annual growth rate of 11.6%.[11] Enrollment in community colleges (both in-state and out-of-state) increased a healthy average of 6.3% per year. In contrast, private nonprofit institutions registered a modest 3.6% growth rate per year and enrollment in 4-year public colleges (both in-state and out-of-state) grew only 1.8% per year.

---

[11] Strayer University opened two campuses in Kentucky in 2007 and the third in 2009. Beginning in 2007, we assume Strayer University's Kentucky enrollment is 3% of total Strayer enrollment. This is based on the percentage of Strayer University's campuses in Kentucky (i.e., 3 of 89).

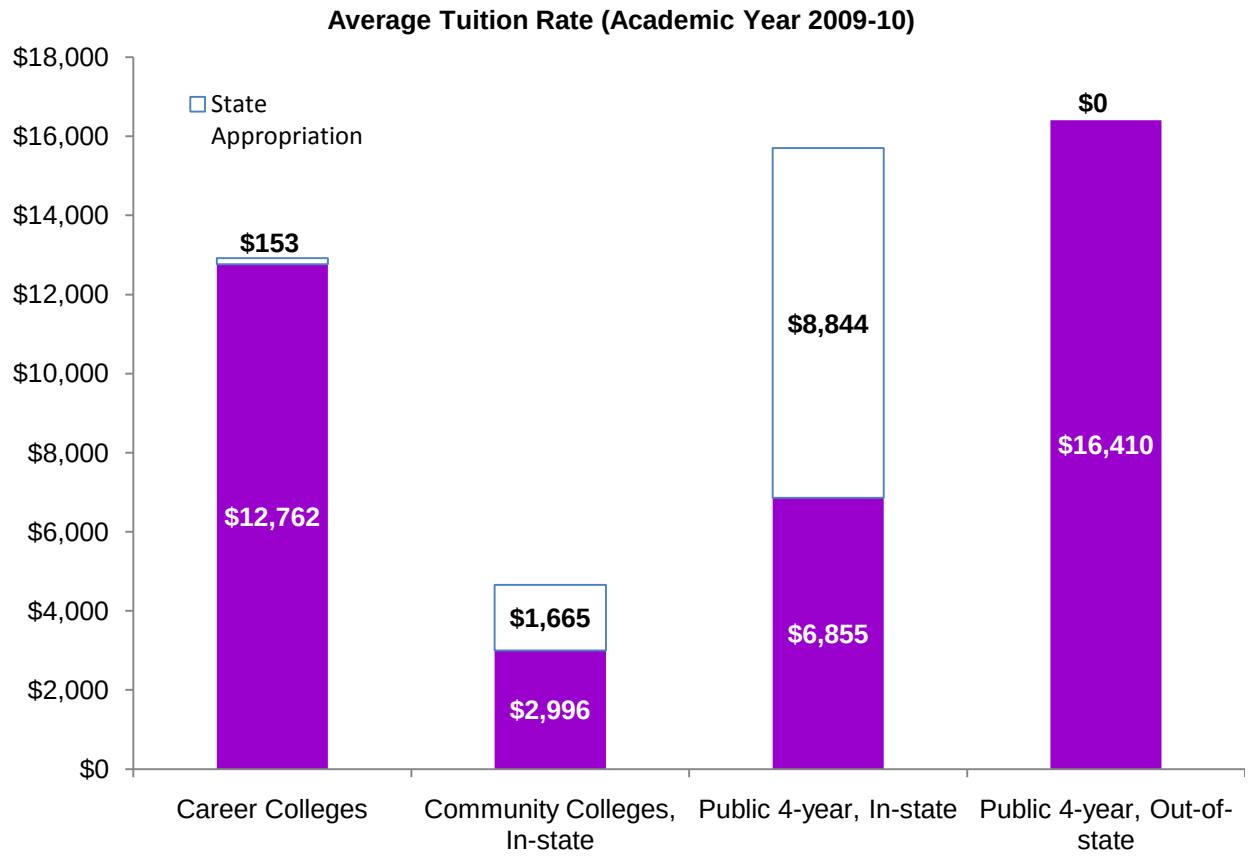
| Table 3.2: Historic Enrollment Growth | | | | | |
|---|---|---|---|---|---|
| | Career Colleges | Community Colleges | Public 4-year Colleges | Other (Private non-profit) Colleges | Total |
| 2000 | 9,748 | 57,708 | 103,437 | 28,371 | 199,264 |
| 2001 | 11,183 | 69,783 | 108,566 | 29,482 | 219,014 |
| 2002 | 11,197 | 75,350 | 113,168 | 30,269 | 229,984 |
| 2003 | 13,142 | 80,340 | 116,134 | 31,102 | 240,718 |
| 2004 | 15,481 | 81,272 | 116,719 | 31,758 | 245,230 |
| 2005 | 15,929 | 84,669 | 116,910 | 32,986 | 250,494 |
| 2006 | 16,996 | 86,237 | 117,961 | 33,358 | 254,552 |
| 2007 | 18,935 | 92,533 | 118,701 | 35,251 | 265,420 |
| 2008 | 19,480 | 89,722 | 119,248 | 36,731 | 265,181 |
| 2009 | 26,141 | 100,112 | 121,396 | 38,849 | 286,498 |
| Average Annual Growth | 11.6% | 6.3% | 1.8% | 3.6% | 4.1% |
| Source: IPEDS | | | | | |

## 3.4. Tuition

On average, tuition at Kentucky's career colleges ($12,762 per year in 2009-2010 academic year) is higher than the in-state tuition rate of both community colleges (average $2,996) and public 4-year institutions ($6,855)—if taxpayer subsidies are not considered. However, tuition at career colleges is significantly less than the out-of-state tuition rate of public 4-year colleges (Figure 3.3).

Public 4-year and community colleges are able to offer lower tuition rates for Kentucky residents because they receive funding from the state government. Even though Kentucky students pay lower tuition to attend public colleges, state taxpayers are subsidizing lower tuition rates with their tax dollars. Based on data from the 2009-2010 academic year, the annual average state appropriation for public colleges was $1,665 per in-state student for 2-year colleges and $8,672 for 4-year colleges, compared to $153 per student for career colleges.[12] Thus, the public 4-year out-of-state tuition rates are a more equitable comparison with that of Kentucky's career colleges, as their cost structure more closely reflects the cost of educating students without state subsidies.[13] From that perspective, Kentucky's career colleges have more cost-effective operations and present a greater return on investment for the state.[14]

[12] A more detailed analysis of the financing structure of public and career colleges is presented in Section 6.
[13] Kentucky community colleges have very few out-of-state students so an average out-of-state tuition rate is not calculated.
[14] A more detailed analysis on the taxpayer's return on investment is presented in Section 7.2.

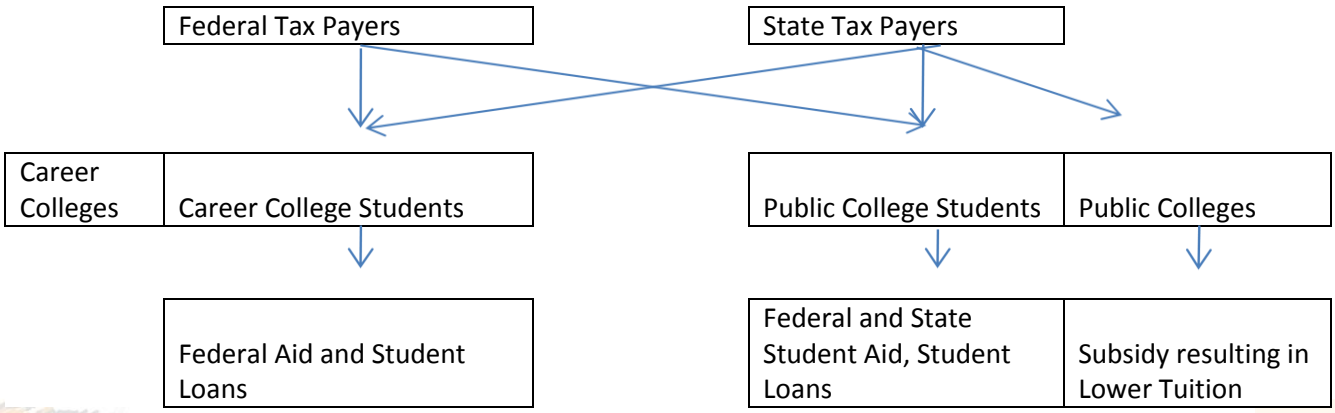



Source: IPEDS

## 3.5. Financial Aid

Many of Kentucky's career colleges participate in the federally-funded Title IV program, which means career college students are eligible for these funds. The Title IV programs include both federal grants (such as Pell Grants) and student loans (such as Perkins and Stafford Loans). In addition to Title IV funds, students may also receive scholarships or grants from state or local governments. Academic institutions can also fund their own financial aid programs such as scholarships and tuition discounts.

**Figure 3.3: Taxpayer Funding Stream for Higher Education**



Of the students enrolled in Kentucky's career colleges in the 2009-2010 academic year, a majority (72.3%) obtained student loans compared to 29.4% for students attending community colleges and 49.3% for students attending Kentucky's public 4-year colleges. Not only did a higher share of career college students take on loans, but the average loan amount was larger. The average loan amount per loan recipient was $8,544 for the 2009-2010 academic year for career college students, compared to $4,101 for community college students and $5,884 for students at Kentucky's public 4-year colleges.

In addition to loans, 59.5% of career college students received a federal grant, more than those attending public institutions. The most striking difference is that only 26.4% of students in Kentucky's career colleges received aid from state or local governments while 68.6% of community college students and 73.5% of public 4-year college students received such aid. The state grants and aid given to students are awarded on top of the state appropriations that are provided directly to community colleges and public 4-year colleges, which are reflected in the low tuition rates for public colleges. For more information on the revenue streams impacting student tuition rates included in this analysis, see Section 7.2.1.

**Table 3.3: Percentage and Amount of Financial Aid Per Student Receiving Aid (2009-10 Academic Year)**

| | Federal Grant | | State and Local Aid | | Institutional Aid | | Student Loans | |
|---|---|---|---|---|---|---|---|---|
| | % Students | Amount per Recipient | % Students | Amount per Recipient | % Students | Amount per Recipient | % Students | Amount per Recipient |
| Career Colleges | 59.5% | $3,846 | 26.4% | $1,150 | 15.6% | $1,399 | 72.3% | $8,544 |
| Community Colleges | 53.0% | $3,698 | 68.6% | $1,526 | 6.5% | $1,955 | 29.4% | $4,101 |
| Public 4-year Colleges | 28.6% | $4,253 | 73.5% | $2,062 | 45.7% | $5,620 | 49.3% | $5,884 |

Source: IPEDS

Kentucky's career colleges also use their own funds to provide financial aid to their students. In fact, they provided financial assistance to 15.6% of their students in the 2009-2010 academic year, averaging $1,399 per recipient. By comparison, community colleges in Kentucky only provided institutional aid to 6.5% of their students, averaging $1,955 per recipient. Public 4-year colleges in Kentucky provided institutional aid for 45.7% of their students.

Table 3.4 provides a summary of the financial aid structure for an average Kentucky student enrolled in a post-secondary institution. On a per enrolled-student basis, students in career colleges received an average $8,985 in financial aid in 2009-2010. However, 69% of the financial aid package came from student loans—which are paid back after graduation—25% were federal grants requiring no payback, and only 3% came from state and local sources. This is dramatically different from the financial aid structure of community college students, where 45% of aid came from federal grants, 24% was from state and local sources, and only 28% came from student loans. The financial aid structure of students in public 4-year colleges is more concentrated on student loans and institutional aid.[15]

[15] The private, not-for-profit schools are not analyzed in the tuition analysis or the return on investment in this study. They are not part of the study population.

| Table 3.4: Percentage and Amount of Financial Aid per Enrolled Student (2009-10 Academic Year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Federal Grant | | State and Local Aid | | Institutional Aid | | Student Loans | | |
| | % Total Aid | Amount per Student | % Total Aid | Amount per Student | % Total Aid | Amount per Student | % Total Aid | Amount per Student | Total Aid |
| Career Colleges | 25.5% | $2,290 | 3.4% | $304 | 2.4% | $218 | 68.7% | $6,173 | $8,985 |
| Community Colleges | 45.2% | $1,959 | 24.1% | $1,047 | 2.9% | $126 | 27.8% | $1,205 | $4,338 |
| Public 4-year Colleges | 14.8% | $1,216 | 18.5% | $1,516 | 31.3% | $2,566 | 35.4% | $2,899 | $8,198 |
| Source: IPEDS | | | | | | | | | |

Analysis of the sources of financial aid indicates that Title IV programs provide students with access to Kentucky's career colleges through federal aid; additionally, Kentucky has provided access to state financial aid programs to students attending career colleges, but at a much lower level. Students in Kentucky's career colleges rely more on student loans than grants to fund their education. Unlike federal and state grants, student loans are required to be paid back after graduation. As a result, students in career colleges require less financial assistance from federal or state taxpayers compared with students in community and public 4-year colleges in Kentucky. The detailed analysis of taxpayer expenses is analyzed in Section 7.

## 3.6. Other School Quality Indicators

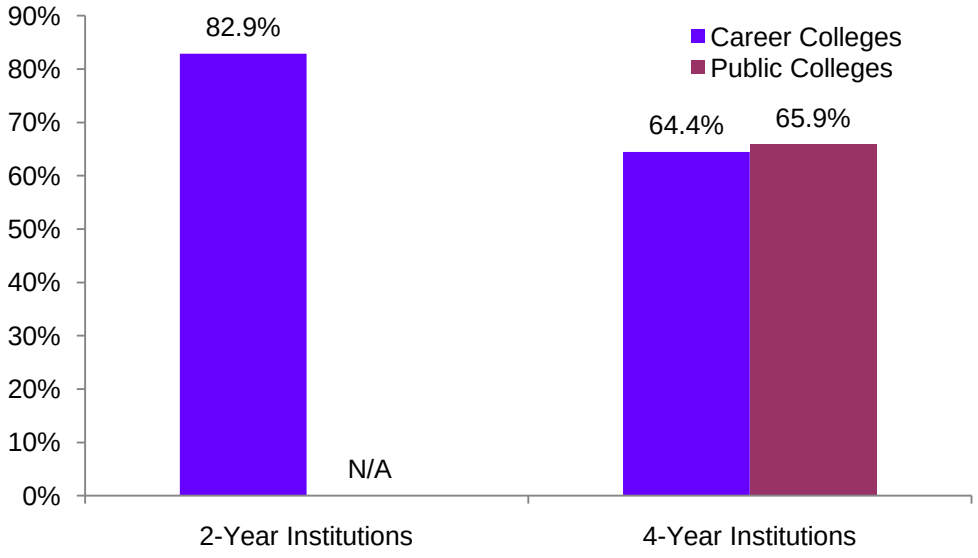
### 3.6.1. Admissions Rates

Since many career colleges have "open door" admission policies, it is not surprising that the admissions rates for career colleges are relatively high. The community colleges did not report admissions rates so it is not possible to compare it to the 82.9% 2-year career college admissions rate based on 2009-2010 IPEDS data. The admissions rate for 4-year career colleges was 64.4%, slightly lower than the 65.9% rate for 4-year public colleges in Kentucky. The admissions rates data reported for career colleges by IPEDS may be understated because many career colleges did not report such data.[16] Chmura's career college survey, based on 12 of Kentucky's career colleges, shows an admissions rate of 90%, which is slightly higher than the number from IPEDS database.[17]

[16] Thirteen percent of career colleges in Kentucky reported admission rates, and 33% of public colleges reported admission rates.

[17] Those 12 colleges represent 14,485 enrolled students or 55% of total career college enrollment in Kentucky.

**Figure 3.4: Admissions Rate (2009-10 Academic Year)**




Note: None of the public 2-year colleges reported admission

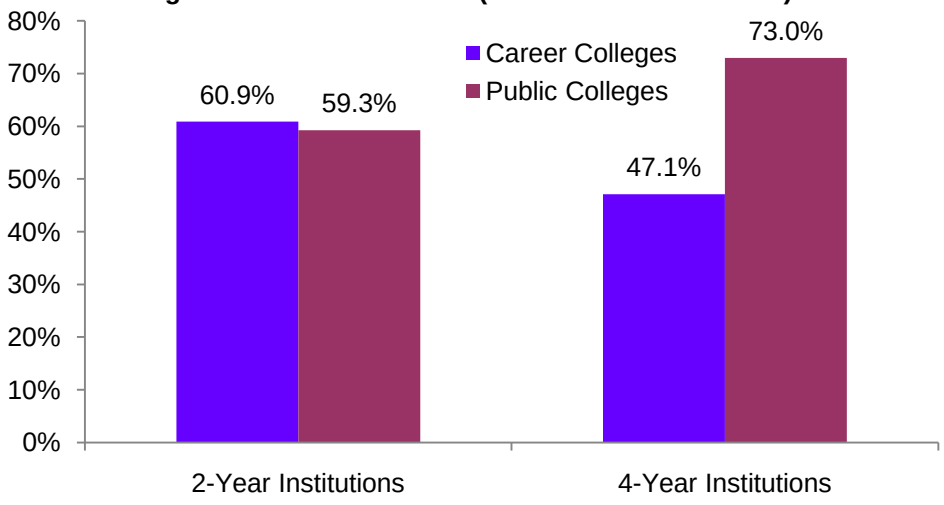
### 3.6.2. Retention Rates

Retention rates are defined as the percentage of first-time degree or certificate-seeking students of the previous fall term who return for the current fall term.[18] For the 2009-2010 academic year, the retention rate for Kentucky's career colleges (2-year and 4-year collectively) was 59%. In particular, the average retention rate for Kentucky's 2-year career colleges was 60.9%, slightly higher than the 59.3% rate for Kentucky community colleges. The retention rate for 4-year career colleges was 47.1%, lower than the 73.0% retention rate for 4-year public colleges in Kentucky.[19]

[18] Many career college students are not considered to be "first-time" students under the IPEDS definition and therefore are not represented in the retention rate data.

[19] Ninety-three percent of career colleges and 100% public colleges reported retention rates in IPEDS.

**Figure 3.5: Retention Rate (2009-10 Academic Year)**




Source: IPEDS

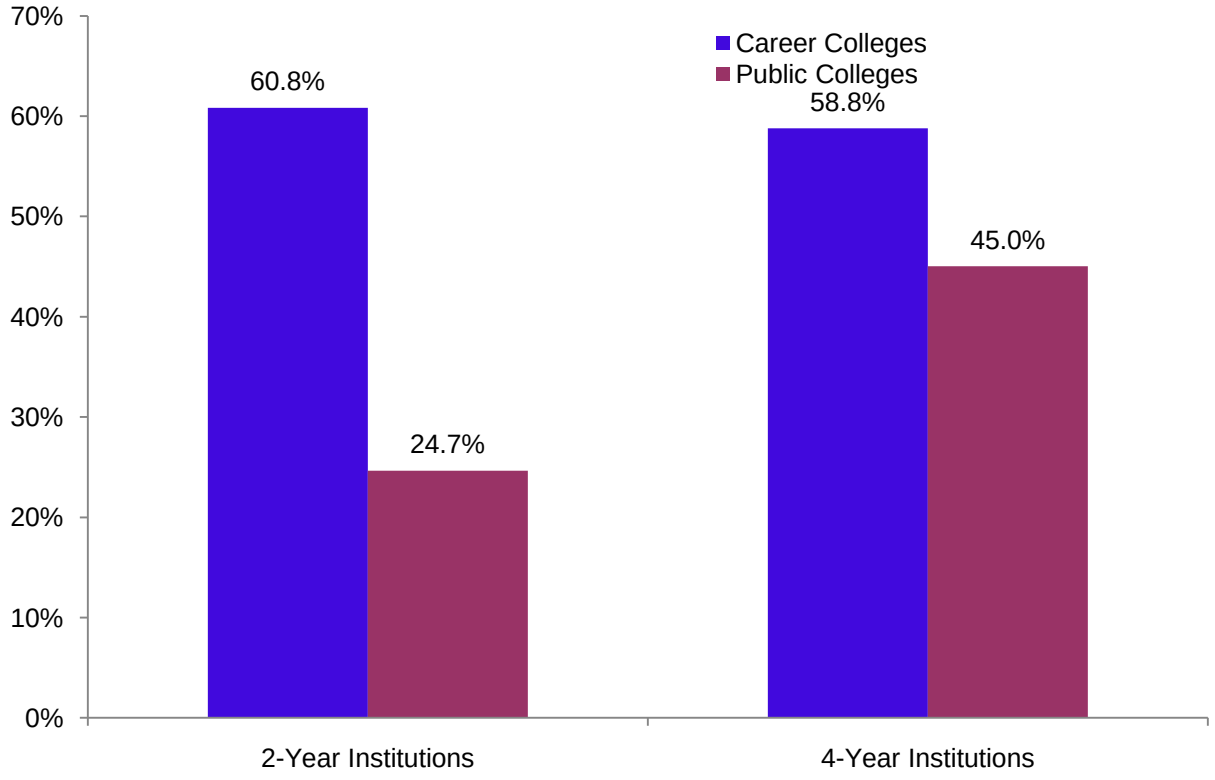
### 3.6.3. Graduation Rates

In the 2009-2010 academic year, the graduation rate for Kentucky's career colleges was 60%.[20] In this study, the graduation rate is defined as the percentage of students of a particular entry class who graduate with a degree or certificate within 150% of the normal program time. For 2-year programs, that means students complete the programs within 3 years; for 4-year programs that translates into 6 years.

Based on 2009-2010 academic year data, the average graduation rate for Kentucky's 2-year career colleges was 60.8%, higher than Kentucky's community colleges at 24.7%. The graduation rate for 4-year career colleges was 58.8%, higher than the 45.0% rate for 4-year public colleges in Kentucky. These graduation rates (as shown in Figure 3.6) do not include students who transfer out. Many community college students transfer to 4-year colleges before graduation. In the 2009-2010 academic year, for example, 12% of Kentucky community college students transferred out, much higher than that for 2-year career colleges at 2%. Even accounting for transfers, however, the 2-year career colleges still achieved a much higher completion rate than community colleges.

[20] All career colleges and public college reported this indicator in IPEDS.

**Figure 3.6: Graduation Rate (2009-10 Academic Year)**




Source: IPEDS

Both men and women graduated at higher rates from Kentucky's career colleges than its public 2 and 4-year institutions. Based on 2009-2010 academic year data, the average graduation rate for men at Kentucky's career colleges was 61.0%, higher than both Kentucky's community colleges at 23.5% and 4-year public colleges at 41.8%. The average graduation rate for women at Kentucky's career colleges was 59.6%, higher than both Kentucky's community colleges at 25.5% and 4-year public colleges at 47.6%.

**Table 3.5: Graduation Rates by Gender (Fall 2009 Enrollment)**

| | Male | Female |
|---|---|---|
| Career Colleges | 61.0% | 59.6% |
| Community Colleges | 23.5% | 25.5% |
| Public 4-year Colleges | 41.8% | 47.6% |

Source: IPEDS

Kentucky's career colleges fill an important niche by providing access to higher education for underserved minority students, especially African-American students. African-American students graduate at higher rates from Kentucky's career colleges than its public 2 and 4-year public institutions. Based on 2009-2010 academic year data, the average graduation rate for African-Americans, who accounted for 21.9% of career college enrollment in Fall 2009, was 52.5%, higher than both Kentucky's community colleges at 14.0% and 4-year public colleges at 30.2%. The career college graduation rate for Hispanic students was 37.9%, above the 18.8% for community colleges, but slightly below the 39.5% for 4-year public colleges. Asian students graduated from Kentucky's career colleges at a 72.5% rate, higher than both the 23.0% for community colleges and the 49.6% for 4-year public

colleges. The number of students for other minority groups was relatively small, and their graduation rates tended to vary greatly. .. Kentucky's career colleges not only provide access to higher education to groups underserved by Kentucky's public institutions, but they also graduate minority students, particularly African-Americans who represent more than one-fifth of Kentucky's career college students, at a higher rate than Kentucky's public institutions.

**Table 3.6: Graduation Rates by Race (Fall 2009 Enrollment)**

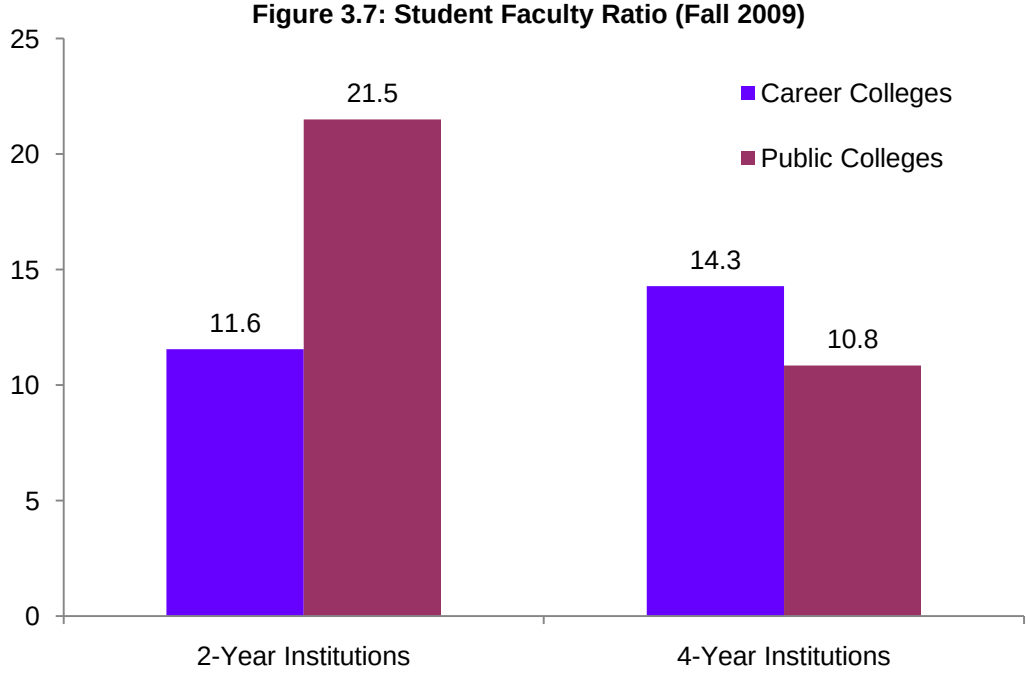
| | White | African-American | Hispanic | Asian | American Indian | International | Race Unknown |
|---|---|---|---|---|---|---|---|
| Career Colleges | 64.0% | 52.5% | 37.9% | 72.5% | 18.1% | 76.9% | 44.0% |
| Community Colleges | 25.9% | 14.0% | 18.8% | 23.0% | 23.8% | 18.2% | 23.3% |
| Public 4-year Colleges | 46.5% | 30.2% | 39.5% | 49.6% | 37.0% | 52.3% | 41.8% |

Source: IPEDS

### 3.6.4. Student-to-Faculty Ratios

Kentucky's 2-year career colleges have a lower student/faculty ratio than community colleges. Based on Fall 2009 data, the student-to-faculty ratio was 11.6 to one for 2-year career colleges and 21.5 to one for community colleges. This suggests that the students in 2-year career colleges gain more access to instructors to receive guidance and personal instruction, which leads to a higher-quality learning experience and higher-student satisfaction. The student-to-faculty ratio for 4-year career colleges was higher than that for public 4-year colleges as seen in Figure 3.7.[21]

**Figure 3.7: Student Faculty Ratio (Fall 2009)**




Source: IPEDS

[21] All career colleges and public colleges reported this indicator in IPEDS.

## 3.7. Labor Market Results

Because career colleges in Kentucky offer a practical curriculum aligned with market demands, their graduating students have good employment attainment rates. The twelve colleges that responded to the Chmura career college survey reported that 69% of their students were able to obtain employment in their fields of study within six months of graduation. Several colleges reported that the average salary of their graduating students increased by an estimated 20% to 38% compared with their income prior to entering career colleges.

## 3.8. Other Insights from the Survey

### 3.8.1 Kentucky's career colleges are very responsive to market demand.

- They show more flexibility in meeting business and student needs than traditional colleges.
- All participating schools in the Chmura career college survey reported that they had established industry advisory boards for their programs. These boards are made up of highly qualified individuals in their respective fields; they meet to discuss offerings and recommend changes and ensure the colleges are maintaining up-to-date training.
- One school, in particular, reported that it surveys companies that employ its graduates to request feedback on its students' preparation, professionalism, and training; the college uses the feedback to measure program effectiveness and identify areas for improvement.

### 3.8.2 Many Kentucky career colleges utilize state-of-the-art technologies and facilities for training.

- One college responded that it has been aggressively building a "Cloud" infrastructure for delivering computer technology and expanding its ability to deliver several thousand virtual desktops in an anywhere, anytime environment.
- Classrooms equipped with projectors, white boards, and computer equipment were also common at Kentucky's career colleges.
- Another college mentioned its Energy Technology Building, which is used by instructors as a model of the current HVAC-R Technology principles it teaches.
- One college with a nursing program noted it had the latest patient simulation models; that same institution also offers a fully-equipped physical fitness lab for its Personal Trainer program. Another college with a nursing program said its facilities include state-of-the-art fully-equipped medical labs.

# 4. Student Profiles

Kentucky's career colleges serve a unique non-traditional student population. Compared with students in community colleges and public 4-year colleges, the student population at career colleges is more likely to include more minority students, older students, and part-time students who are working adults. The career college learning model more closely integrates a life-long learning atmosphere into the classroom experience due to its consideration of lifestyle demands on learning processes.

The student profile analysis indicates that Kentucky's career colleges serve the niche of students who are underserved by traditional 2-year and 4-year colleges and universities. In other words, Kentucky's career colleges help level the playing field for students from low-income families, minority students, and adult students.

## 4.1. Gender

The students at Kentucky's career colleges are weighted heavily toward females. Based on Fall 2009 enrollment data, 70.7% of students enrolled in Kentucky's career colleges were female while only 29.3% were male. Female students are more concentrated in career colleges than in community and public 4-year colleges. For example, 54.9% of all community college students and 56.3% of all public 4-year college students were female in Fall 2009.

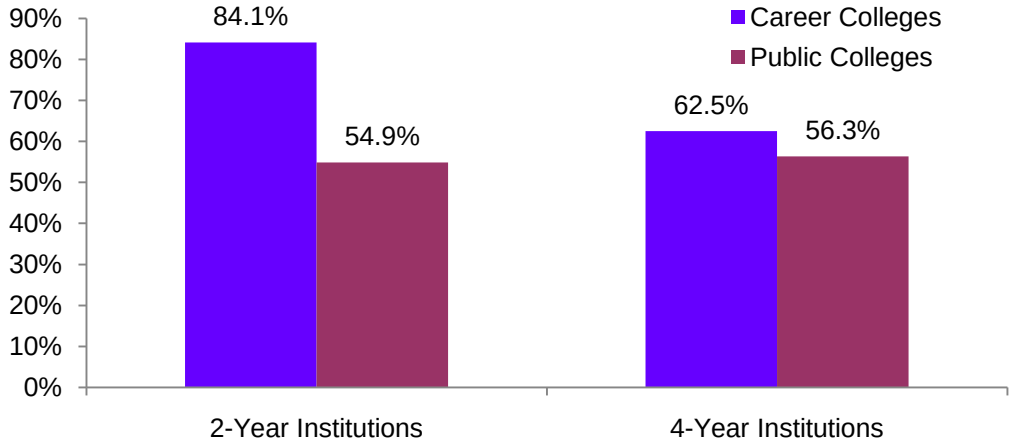
**Table 4.1: Gender Distribution (Fall 2009)**

| | Number | | Percentage | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Career Colleges | 7,653 | 18,489 | 29.3% | 70.7% |
| Community Colleges | 45,185 | 54,927 | 45.1% | 54.9% |
| Public 4-year Colleges | 52,990 | 68,406 | 43.7% | 56.3% |
| Total | 105,828 | 141,822 | 42.7% | 57.3% |

Source: IPEDS

There may be a variety of reasons for the high concentration of female students. It may be that Kentucky's career colleges provide the flexibility that women, especially those with children, may not be able to find in other traditional 2-year or 4-year colleges. It may also reflect preferences in the program offerings for career colleges, which include a large number of business, healthcare, and personal service programs.

**Figure 4.1: Percentage of Female in Total Enrollment (Fall 2009)**




Source: IPEDS

## 4.2. Diversity

The student population at Kentucky's career colleges is more racially diverse than that of community colleges or public 4-year colleges. In Fall 2009, only 54.7% of the student career college population was white, compared to 82.7% at Kentucky's community colleges and 82.5% at 4-year public colleges. African-Americans accounted for 21.9% of students in Kentucky's career colleges; this is more than double the percentage at the other two institutions. Compared to community colleges and 4-year public colleges, career colleges have a higher concentration of Hispanic students. Career colleges have a larger percentage of Asian students compared to community colleges, but have a smaller percentage compared to public 4-year colleges in Kentucky. In addition, only 0.7% of Kentucky's career college students are international, while 2.6% of public 4-year college students in Kentucky are from foreign countries (Fall 2009 enrollment data).

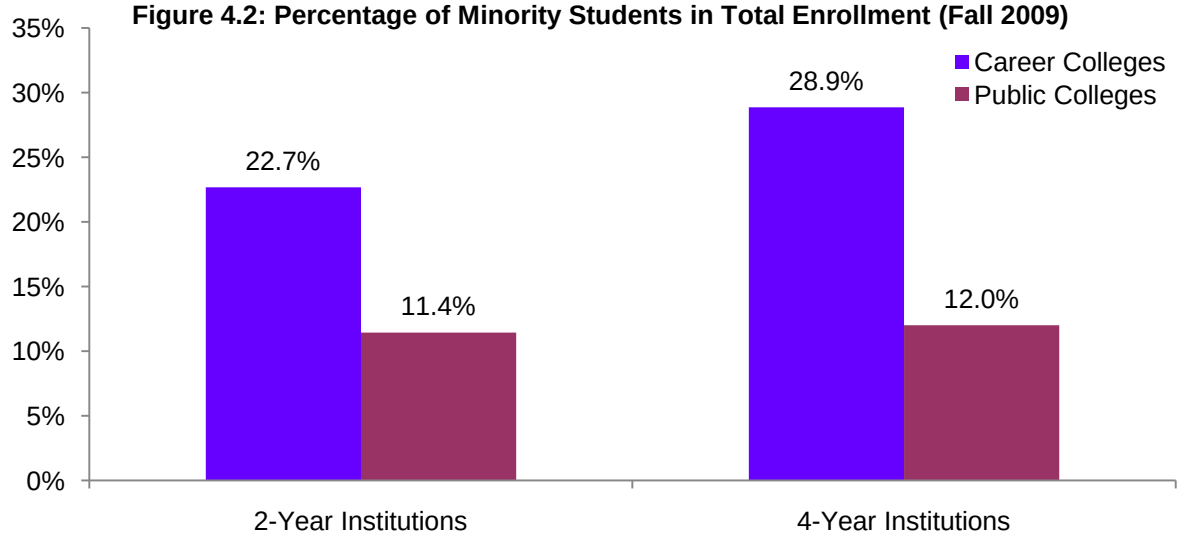
**Table 4.2: Race Distribution (Fall 2009)**

| | White | African-American | Hispanic | Asian | American Indian | International | Race Unknown |
|---|---|---|---|---|---|---|---|
| Career Colleges | 54.7% | 21.9% | 2.1% | 1.3% | 0.7% | 0.7% | 18.6% |
| Community Colleges | 82.7% | 8.6% | 1.5% | 0.9% | 0.4% | 0.1% | 5.8% |
| Public 4-year Colleges | 82.5% | 8.7% | 1.4% | 1.7% | 0.3% | 2.6% | 2.8% |
| Total | 81.5% | 9.2% | 1.5% | 1.3% | 0.3% | 1.5% | 4.7% |

Source: IPEDS

Kentucky's career colleges fill an important niche by providing access to higher education for underserved minority students, especially African-American students. Kentucky's community colleges and public 4-year colleges have capacity limitations, implying that they cannot accept all Kentuckians who want to pursue a postsecondary education. Without career colleges, many of those minority students may not receive a higher education.

**Figure 4.2: Percentage of Minority Students in Total Enrollment (Fall 2009)**




Source: IPEDS

## 4.3. Age Groups

Kentucky's career colleges provide access to postsecondary education for non-traditional adult students. Traditional college students are generally between their late teens and early twenties. For example, in the Fall 2009

term, 31.2% of Kentucky's community college students and 25.1% of public 4-year college students were less than 20 years old. As a comparison, only 7.4% of Kentucky's career college students were less than 20 years old. On the other hand, 27.3% of career college students were between 30 and 39 years old, compared with 16.6% at community colleges and 10.6% at public 4-year colleges.

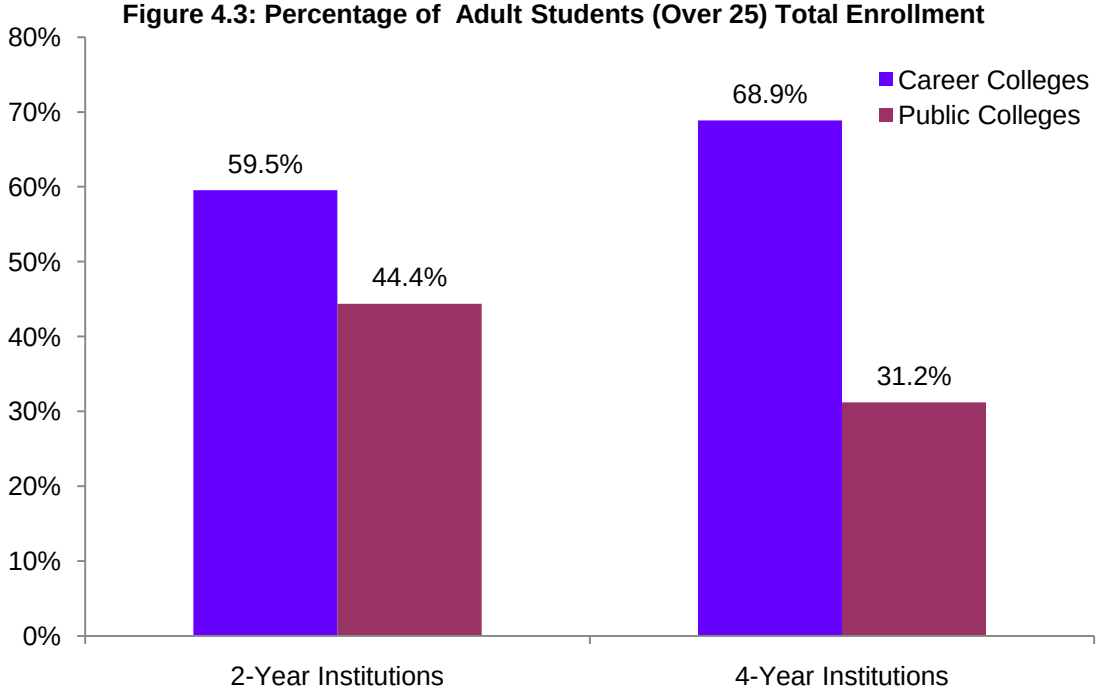
**Table 4.3: Age Distribution (Fall 2009)**

| | Below 20 | 20-24 | 25-29 | 30-39 | 40-49 | Over 50 |
|---|---|---|---|---|---|---|
| Career Colleges | 7.4% | 27.2% | 20.8% | 27.3% | 12.6% | 4.7% |
| Community Colleges | 31.2% | 24.5% | 12.5% | 16.6% | 9.4% | 5.8% |
| Public 4-year Colleges | 25.1% | 43.7% | 13.5% | 10.6% | 4.8% | 2.3% |
| Total | 25.8% | 33.9% | 13.8% | 14.8% | 7.6% | 4.1% |

Source: IPEDS

Defining adult students as those over age 25, Figure 4.3 shows that 68.9% of students at Kentucky's 4-year career colleges were adult students in Fall 2009, more than double the percentage (31.2%) at public 4-year colleges. The gap in the adult student percentage is smaller for 2-year institutions, with 59.5% for Kentucky's career colleges as opposed to 44.4% for community colleges.

**Figure 4.3: Percentage of Adult Students (Over 25) Total Enrollment**




Source: IPEDS

The data suggest that Kentucky's career colleges, due to their curriculum emphasis on high-demand fields and flexible schedules (evening, weekend, and online classes), are able to provide educational access to working adults who are not able to go to traditional colleges while working. Those adult students will, in effect, gravitate toward career colleges.

## 4.4. Part-Time and Full-Time Students

The fact that full-time students accounted for 67.9% of enrollment at Kentucky's career colleges in the Fall 2009 term, with the remaining 32.1% being part-time students, shatters the misconception about career colleges that the majority of their students are part-time. [22] While it is true that more working adults are attending career colleges, more than two-thirds of their students are full-time students. This number is consistent with information gathered from the Chmura career college survey. According to the four colleges participating in the survey that answered this question, an estimated 37% of their students work full-time while attending school.[23]

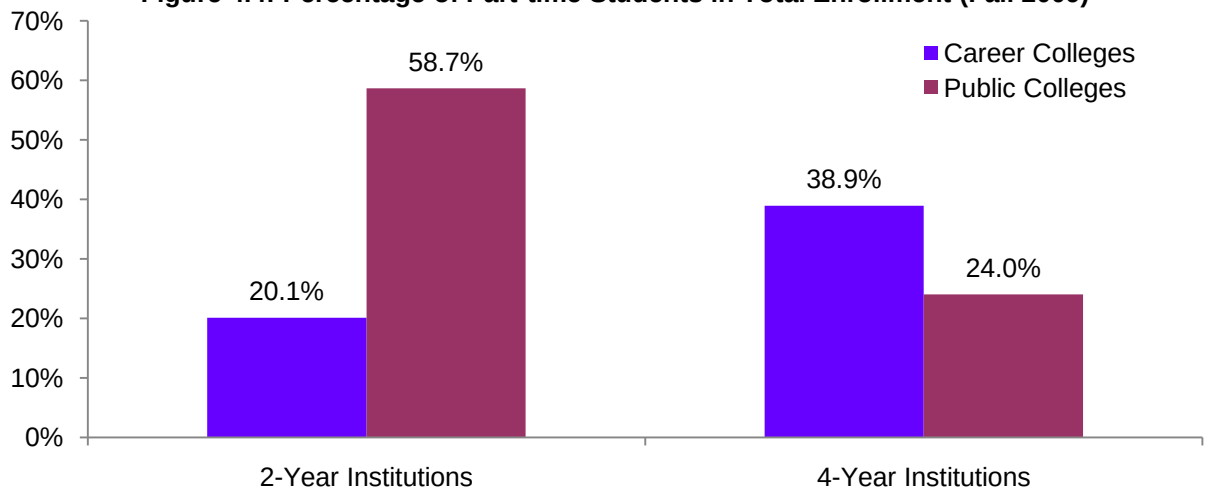
**Table 4.4: Full Time/Part Time Students (Fall 2009)**

| | Number | | Percentage | |
|---|---|---|---|---|
| | Full-Time | Part-Time | Full-Time | Part-Time |
| Career Colleges | 17,762 | 8,379 | 67.9% | 32.1% |
| Community Colleges | 41,383 | 58,729 | 41.3% | 58.7% |
| Public 4-year Colleges | 92,269 | 29,127 | 76.0% | 24.0% |
| Total | 151,414 | 96,235 | 61.1% | 38.9% |

Source: IPEDS

The percentage of part-time students differs for 2-year and 4-year institutions. In Fall 2009, Kentucky's 4-year career colleges had a higher percentage (38.9%) of part-time students than did public 4-year colleges (24.0%). However, 2-year career colleges enrolled fewer part-time students than Kentucky's community colleges, as only 20.1% of their students were part-time compared to 58.7% at the community colleges.

**Figure 4.4: Percentage of Part-time Students in Total Enrollment (Fall 2009)**




Source: IPEDS

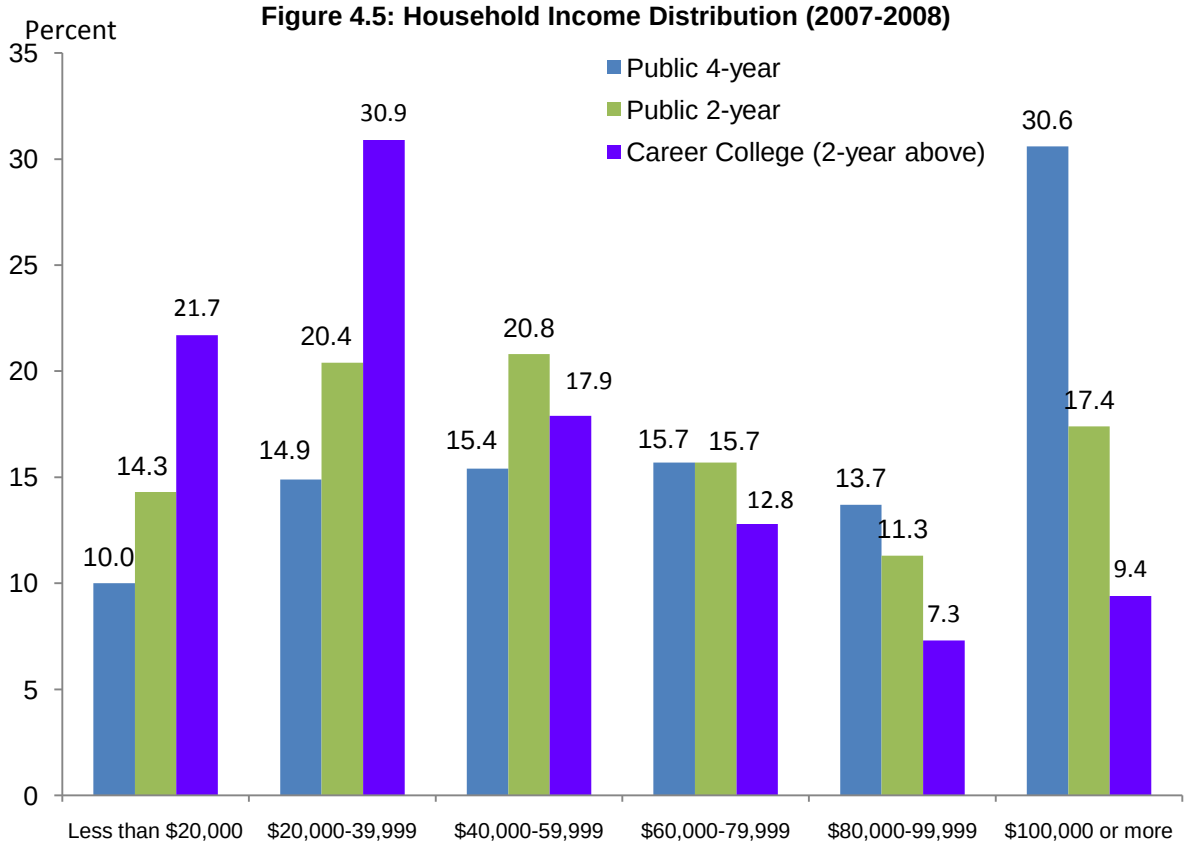
[22] All career colleges and public colleges reported this indicator in IPEDS. Because many career colleges offer evening and weekend classes, their students have the flexibility to be full-time students while still working which is typically not the case for students at public and non-profit institutions.

[23] These four colleges represent a total of ten career college campuses in Kentucky.

## 4.5. Household Income

National studies show that students in career colleges are more likely to come from low-income households.[24] Based on national data for the 2007-2008 academic year for non-independent students,[25] 21.7% of career college students came from families with an annual household income less than $20,000 per year, compared with 10.0% for public 4-year institutions and 14.3% for public 2-year colleges. Similarly, 30.9% of career college students came from families with an annual household income between $20,000 and $39,999—about twice as many as in 4-year public colleges. In contrast, only 9.4% of the career college students came from families with an annual household income of $100,000 or more compared with 30.6% of public 4-year students and 17.4% of public 2-year students. Though state-level data were not provided by IPEDS, the household income distribution among Kentucky students should follow a similar pattern.

**Figure 4.5: Household Income Distribution (2007-2008)**




Source: IPEDS

[24] Source: 2007-08 National Postsecondary Student Aid Study, National Center for Education Statistics. This study does not break out the household income data by state.

[25] Non-independent students are those who are financially dependent on their families while in school.

# 5. Occupation Impact

Details on the academic awards provided by career colleges in Kentucky are shown in Section 3.2. In this section, these awards are translated into occupation impact which is compared to demand for these occupations in the state.

## 5.1. Awards-to-Occupations Methodology

When a graduate enters the workforce with a specific postsecondary degree or award, it cannot be predicted for certain which occupation the graduate will enter, if they indeed enter the workforce at all. Yet, it is useful to model what will happen so as to understand the likely workforce impact of postsecondary institutions—in this case, the impact of career colleges in Kentucky.

The modeling used in this report was developed by Chmura and uses proprietary methods along with the National Center for Education Statistics (NCES) postsecondary awards data as well as the NCES crosswalk between academic programs (categorized by the Classification of Instructional Programs—CIP codes) and occupations (categorized by the Standard Occupational Classification System—or SOC codes).

## 5.2. Overall Occupation Impact in Kentucky

In the 2008-2009 academic year, Kentucky's career colleges granted certificates and degrees that provided training for 6,386 occupations.[26] By comparison, all of Kentucky's postsecondary schools provided training in the same academic year for 58,527 occupations. Thus, career colleges accounted for 11% of the postsecondary training impact in Kentucky during this period.

Over a third of the awards from Kentucky's career colleges lead to careers in healthcare-related occupations. In the 2009-2010 academic year, 1,415 awards led to healthcare practitioners and technical occupations while 861 awards led to healthcare support occupations. The other occupation groups most benefitting from career college awards in Kentucky are personal care and service (1,095 related awards granted in 2008-2009), management (892), office and administrative support (426), computer and mathematical (338), and business and financial operations (327).

Technical occupations related to science, technology, engineering, and mathematics are known as STEM occupations. Workers in such occupations use science and math to solve problems.[27] There is, however, no universally accepted definition for these occupations. This report uses the definition developed by Barroilhet and Udalova.[28] According to this definition, roughly a quarter (25%) of the awards from postsecondary institutions in the Bluegrass State in the 2009-2010 academic year were linked to STEM occupations. Kentucky's career colleges were more heavily oriented towards STEM occupation training compared to other schools in the state, with 27% of career college awards linked with STEM occupations. Put another way, Kentucky's career colleges trained 11% of

---

[26] The number of occupations is less than the number of awards because some CIP programs are not linked with any occupation in the SOC codes; for example: CIP 30.0501, "Peace Studies and Conflict Resolution."
[27] "STEM Occupations," Nicholas Terrell, *Occupational Outlook Quarterly*, Spring 2007.
[28] This STEM definition includes 176 occupations and can be found here: www.stemequitypipeline.org/_documents/FINAL_LIST_OF_STEM.xls.

all postsecondary award occupations in 2008-2009 while they trained 12% of all STEM postsecondary award occupations.

**Table 5.1: Occupations Trained by Kentucky's Career Colleges by Major Occupation Groups (2009-2010 Academic Year)**

| SOC | Title | |
|---|---|---|
| 29-0000 | Healthcare Practitioners and Technical | 1,415 |
| 39-0000 | Personal Care and Service | 1,095 |
| 11-0000 | Management | 892 |
| 31-0000 | Healthcare Support | 861 |
| 43-0000 | Office and Administrative Support | 426 |
| 15-0000 | Computer and Mathematical | 338 |
| 13-0000 | Business and Financial Operations | 327 |
| 17-0000 | Architecture and Engineering | 281 |
| 35-0000 | Food Preparation and Serving Related | 185 |
| 33-0000 | Protective Service | 141 |
| 25-0000 | Education, Training, and Library | 131 |
| 23-0000 | Legal | 117 |
| 27-0000 | Arts, Design, Entertainment, Sports, and Media | 113 |
| 51-0000 | Production | 64 |
| 49-0000 | Installation, Maintenance, and Repair | <10 |
| 41-0000 | Sales and Related | <10 |
| 19-0000 | Life, Physical, and Social Science | <10 |
| **Total - All Occupations** | | **6,386** |

Source: Chmura Economics & Analytics

## 5.3. Detailed Occupation Impact

### 5.3.1. Top Twenty Occupations Impacted

When the detailed occupation data are viewed, the specific impact of career colleges in Kentucky's training infrastructure becomes clearer. In the 2009-2010 academic year, three of the top four occupations trained by Kentucky's career colleges were medical-related: medical assistants; licensed practical nurses; and registered nurses (see Table 5.2). Career colleges trained 55% of the students earning awards to become medical assistants; 89% of electrical and electronic engineering technicians; and 48% of radiologic technologists and technicians.

| Table 5.2: Top Twenty Detailed Occupations of Kentucky's Career College Training Impact, 2009-2010 Academic Year | | | | | | | |
|---|---|---|---|---|---|---|---|
| SOC | Title | Career College Training Impact | Impact of Other Kentucky Schools | Total Kentucky Training Impact | % of Impact Due to Career Colleges | STEM | Kentucky Training Concentra-tion |
| 39-5012 | Hairdressers, Hairstylists, and Cosmetologists | 815 | 84 | 899 | 91% | | 1.39 |
| 31-9092 | Medical Assistants | 485 | 402 | 887 | 55% | | 0.69 |
| 29-2061 | Licensed Practical Nurses | 425 | 3,225 | 3,650 | 12% | | 4.51 |
| 29-1111 | Registered Nurses | 354 | 2,814 | 3,168 | 11% | ✓ | 1.23 |
| 11-1021 | General and Operations Managers | 345 | 1,540 | 1,885 | 18% | | 1.02 |
| 43-6013 | Medical Secretaries | 238 | 393 | 631 | 38% | | 2.84 |
| 31-9011 | Massage Therapists | 230 | - | 230 | 100% | | 2.36 |
| 35-2014 | Cooks, Restaurant | 161 | 143 | 304 | 53% | | 1.46 |
| 13-1111 | Management Analysts | 140 | 625 | 765 | 18% | | 0.94 |
| 17-3023 | Electrical and Electronic Engineering Technicians | 134 | 16 | 150 | 89% | ✓ | 0.81 |
| 39-5092 | Manicurists and Pedicurists | 125 | 13 | 138 | 91% | | 1.46 |
| 29-2034 | Radiologic Technologists and Technicians | 114 | 122 | 236 | 48% | ✓ | 1.02 |
| 29-2055 | Surgical Technologists | 112 | 148 | 260 | 43% | ✓ | 1.88 |
| 39-5094 | Skin Care Specialists | 111 | 11 | 123 | 91% | | 1.00 |
| 33-1012 | First-Line Supervisors/Managers of Police and Detectives | 110 | 733 | 843 | 13% | | 1.41 |
| 29-2071 | Medical Records and Health Information Technicians | 107 | 89 | 196 | 55% | ✓ | 0.69 |
| 29-2052 | Pharmacy Technicians | 98 | 17 | 115 | 85% | | 0.53 |
| 23-2011 | Paralegals and Legal Assistants | 96 | 46 | 143 | 68% | | 1.16 |
| 29-2012 | Medical and Clinical Laboratory Technicians | 95 | 246 | 341 | 28% | ✓ | 4.58 |
| 15-1081 | Network Systems and Data Communications Analysts | 93 | 156 | 249 | 37% | ✓ | 1.45 |
| **TOTAL STEM (All Occupations)** | | **1,728** | **12,738** | **14,467** | **12%** | | |
| **GRAND TOTAL (All Occupations)** | | **6,406** | **52,122** | **58,527** | **11%** | | |

Source: Chmura Economics & Analytics

Of the top twenty occupations trained by Kentucky's career colleges, seven are STEM occupations. For two of these STEM occupations, career colleges provided the state with over half of the newly trained workers: electrical and electronic engineering technicians and medical records and health information technicians. Career colleges provide more than a third of newly trained college graduates in the state in the STEM occupations of radiologic technologists and technicians, surgical technologists, and network systems and data communications analysts.

Appendix 2 contains an expanded list of occupations trained by Kentucky's career colleges in the 2009-2010 academic year along with the other details shown in Table 5.2. Overall, there are 497 occupations that are linked to postsecondary school training in Kentucky based on awards from the 2009-2010 academic year. Of these, 146 occupations received training through career colleges. For 46 occupations, career schools in Kentucky were the dominant training provider, educating more than half of the new workers in each of these occupations. Moreover, career colleges were the dominant training provider in Kentucky for 10 STEM occupations.

**Figure 5.1: Top 15 STEM Occupations at Kentucky's Career Colleges; Percent of Training Due to Career Colleges, Kentucky, 2008-2009 Academic Year**

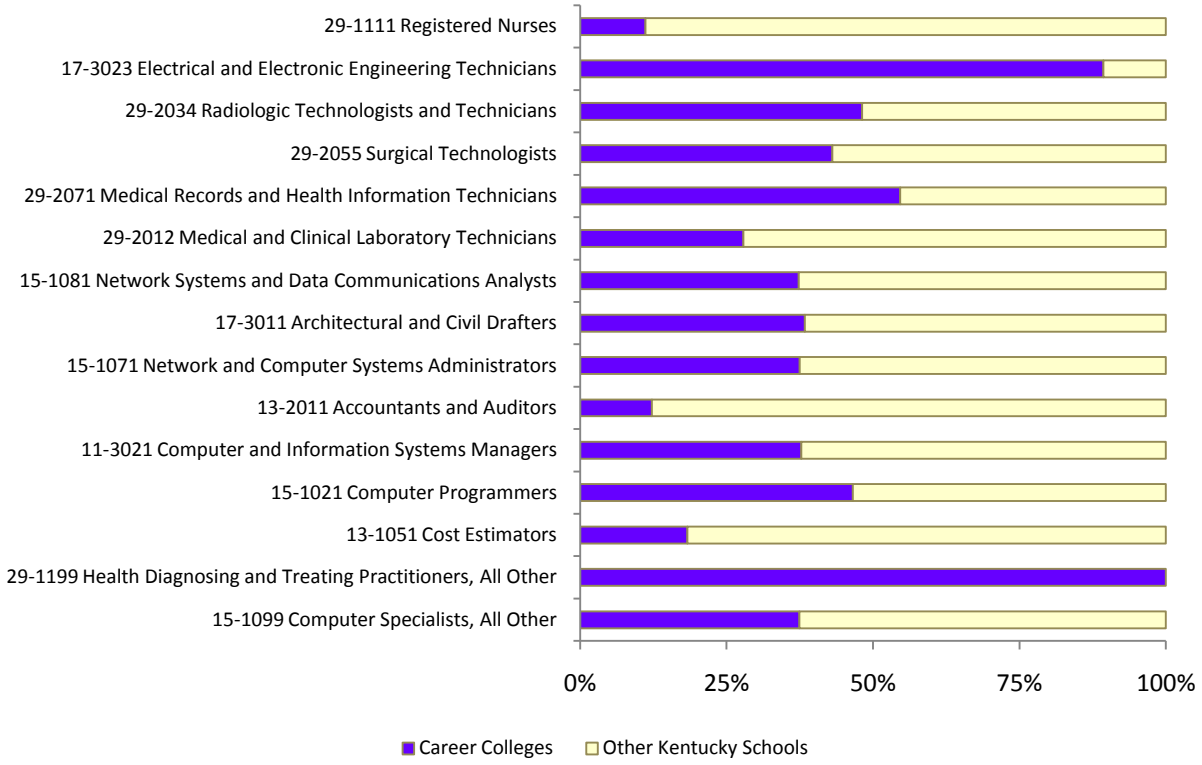



Figure 5.1 illustrates the top fifteen STEM occupations trained by Kentucky's career colleges and the percent of training at career schools versus other schools. This illustrates clearly that career schools do not have a trivial role in Kentucky's training infrastructure. Removing the career college graduates from the new worker supply would have a drastic effect on many of these occupations—eleven of the fifteen rely on career colleges for at least a third of new postsecondary graduates. In addition, more than 85% of the workers in two of these eleven occupations (Health Diagnosing and Treating Practitioners, All Other and Electrical and Electronic Engineering Technicians) received their training from Kentucky career colleges.[29]

## 5.3.2. Training Concentration

In this and the following section, supply and demand is examined for occupations trained at Kentucky's career colleges. Also in this section, the overall training concentration of the state is examined; in the following section, occupation gaps and annual demand are examined. These sections further illustrate that the supply of career college graduates is not superfluous, but is contributing significantly to workforce training in the state. This is examined first by comparing the training output in Kentucky to the nation.

[29] SOC 29-1199, Health Diagnosing and Treating Practitioners, All Other, includes acupuncturists, naturopathic physicians and hypnotherapists.

The training concentrations (TC) shown for the occupations in Table 5.2 compare the training rate in Kentucky relative to that in the nation. The training rate is measured as awards per employment.[30] If the training concentration for a particular occupation is 1.00, this means that Kentucky grants awards at the same rate per employee as in the nation. If the training concentration is 2.00, Kentucky is granting awards at twice the rate of the nation, and if training concentration is 0.50, Kentucky is granting awards at half the rate.

It can't always be assumed that the nation is granting awards at the most proper rate—for some occupations, there may be too few or too many awards granted in the nation. However, if Kentucky's training concentration is significantly below or above 1.00, this may point to critical training irregularities in the state's education infrastructure. To take one example, medical assistants in Kentucky are being trained at a rate approximately 31% lower (TC=0.69) when compared with the nation.

Among the top twenty occupations trained by career colleges in Kentucky (see Table 5.2), five are in occupations with a TC of less than 1.00. In other words, these data suggest Kentucky is not training enough of these occupations to begin with, and if the training output of career colleges were removed or dampened, the training deficits would become even worse. Moreover, if the training output of career colleges were removed from these twenty occupations, Kentucky would have a below average training concentration in thirteen of the twenty occupations. For example, radiologic technologists and technicians have a Kentucky training concentration of about average (1.02), but this output relies greatly on the awards from career colleges which train nearly half of this occupation in the state.

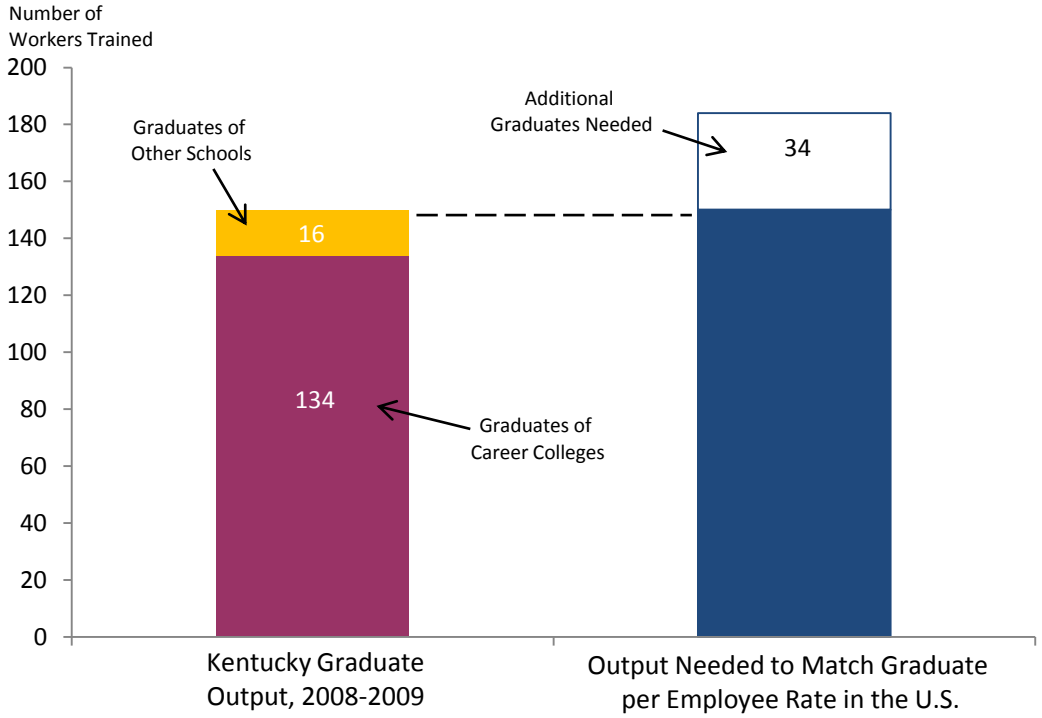
Kentucky's career colleges provide more than half of the training for many occupations[31] with below average training concentration. Therefore, increasing output at the career schools may be the most efficient way to close the training gaps between Kentucky and the nation in these occupations. Taking electrical and electronic engineering technicians as an example (see Figure 5.2), 34 more of these workers need to be trained annually in Kentucky for the state to match the nation in its rate of graduates per worker (i.e., so the training concentration would equal 1.00). Since only 16 new postsecondary-educated workers in this occupation were trained in Kentucky outside of career colleges, these institutions would need to approximately triple their graduate output to cover the gap. Kentucky's career colleges, however, trained 134 of these workers in the 2009-2010 academic year, and so would only need to expand output by 25% to cover the shortfall.

---

[30] For example, if total employment of an occupation was 100 and 5 postsecondary awards are granted per year for this occupation, the rate of awards would be 5%. The TC is a comparison of this rate to the nation.

[31] To be precise, career colleges provide more than half of the training for 31 occupations in Kentucky with below average TC; but some of these occupations are trained at a very low rate. Among occupations with annual training of 50 or more from career colleges in Kentucky, six have below average training capacities and rely on career colleges for more than half of training. Among occupations with annual training of 10 or more from career colleges, 13 have below average training capacities and rely on career colleges for more than half of training.

**Figure 5.2: Example Training Concentration Comparison, Electrical and Electronic Engineering Technicians**




One caution about the training concentration analysis is that a training concentration above 1.00 may not necessarily mean an oversupply of an occupation. Registered nurses, for example, have an above average training concentration in Kentucky (1.23). However, RNs are considered to be in high demand in both Kentucky and the nation. In fact, registered nurses are forecast to add the most jobs in the nation among all 6-digit SOC occupations over the next ten years.[32] Therefore, the higher-than-average training rate of RNs in Kentucky may mean the state is better equipped toward meeting the demand for these occupations than the average state in the nation.

### 5.3.3. Occupation Demand

In this section, Chmura compares the training impact of Kentucky's career colleges to occupation demand. Occupation demand comprises two elements: replacement demand and growth demand. Replacement demand is the occupation demand needed to replace workers due to turnover and retirement. Replacement demand is calculated based upon occupation replacement rates provided by the Bureau of Labor Statistics (BLS). However, the BLS states that their replacement rates underestimate the number of new entrants in an occupation and so should be considered as a minimum measure of training needs.[33] Growth demand, the other component of overall occupation demand, is the number of additional workers needed due to expected overall growth in that occupation—for example, an occupation might be growing because it is being used more often in the industries where it is found and/or because the industries where it is found are expanding employment.

---

[32] Source: JobsEQ.com.
[33] For more details, see: http://www.bls.gov/emp/ep_replacements.htm.

Table 5.3 shows the top twenty detailed occupations that receive training from career colleges in Kentucky compared to occupation demand. When comparing total Kentucky training output to the "minimum total annual demand," it appears that some occupations may have more than enough supply. Nevertheless, these data should be treated carefully as they may be indicating something other than an oversupply. For one, the demand data are minimum figures that include an understatement of the actual replacement demand. Secondly, some of the training output (such as for registered nurses) includes bachelor's and postgraduate degrees, and the individuals earning these awards may be out-of-state students that came to Kentucky for schooling but are going to work elsewhere. However, the correspondences between supply and demand should be investigated and tracked carefully by training providers to ensure graduates are finding employment regionally—the output of LPNs for example, is unusually large in the state.

**Table 5.3: Top Twenty Career College-Produced Occupations Compared to Occupation Demand, Kentucky**

| SOC | Title | Career College Training Impact, 2008-2009 | Total Kentucky Training Impact, 2008-2009 | Current Employment, 2010 | Minimum Annual Replacement Demand | Annual Growth Demand | Minimum Total Annual Demand | Projected Annual Supply Gap* (or Surplus) |
|---|---|---|---|---|---|---|---|---|
| 39-5012 | Hairdressers, Hairstylists, and Cosmetologists | 815 | 899 | 3,584 | 53 | 70 | 122 | 4 |
| 31-9092 | Medical Assistants | 485 | 887 | 7,440 | 83 | 240 | 323 | 101 |
| 29-2061 | Licensed Practical and Licensed Vocational Nurses | 425 | 3,650 | 10,721 | 335 | 197 | 532 | 116 |
| 29-1111 | Registered Nurses | 354 | 3,168 | 38,173 | 667 | 757 | 1,424 | 826 |
| 11-1021 | General and Operations Managers | 345 | 1,885 | 20,205 | 585 | (51) | 585 | 90 |
| 43-6013 | Medical Secretaries | 238 | 631 | 6,801 | 92 | 168 | 260 | 71 |
| 31-9011 | Massage Therapists | 230 | 230 | 638 | 9 | 12 | 21 | 4 |
| 35-2014 | Cooks, Restaurant | 161 | 304 | 11,464 | 293 | 84 | 377 | (64) |
| 13-1111 | Management Analysts | 140 | 765 | 5,627 | 97 | 113 | 210 | 117 |
| 17-3023 | Electrical and Electronic Engineering Technicians | 134 | 150 | 1,440 | 27 | (4) | 27 | (8) |
| 39-5092 | Manicurists and Pedicurists | 125 | 138 | 528 | 8 | 10 | 18 | 1 |
| 29-2034 | Radiologic Technologists and Technicians | 114 | 236 | 3,116 | 45 | 46 | 91 | 31 |
| 29-2055 | Surgical Technologists | 112 | 260 | 1,401 | 35 | 33 | 68 | 18 |
| 39-5094 | Skin Care Specialists | 111 | 123 | 299 | 4 | 11 | 16 | 7 |
| 33-1012 | First-Line Supervisors/Managers of Police and Detectives | 110 | 843 | 1,120 | 49 | 9 | 58 | 15 |
| 29-2071 | Medical Records and Health Information Technicians | 107 | 196 | 2,498 | 51 | 46 | 97 | 22 |
| 29-2052 | Pharmacy Technicians | 98 | 115 | 5,092 | 128 | 143 | 272 | 71 |
| 23-2011 | Paralegals and Legal Assistants | 96 | 143 | 2,512 | 29 | 66 | 94 | 1 |
| 29-2012 | Medical and Clinical Laboratory Technicians | 95 | 341 | 2,117 | 40 | 29 | 69 | 24 |
| 15-1081 | Network Systems and Data Communications Analysts | 93 | 249 | 2,347 | 42 | 120 | 162 | 120 |

*The annual supply gap here is presented as an annual average over a 10-year forecast window.

Source: Chmura Economics & Analytics, JobsEQ, and the BLS

The second item to note in Table 5.3 is that 18 of these 20 occupations have projected occupation supply gaps (as provided by JobsEQ.com[34]). Projections such as these use demographics and other data to project occupation supply growth versus demand growth. Thus, given current demographic and economic trends, these 18 occupations are all projected to have supply shortfalls; this further points to the importance of career schools in Kentucky's economy, since many of the occupations for which they provide training are occupations that are in danger of being in short supply within the 10-year forecast window.

[34] JobsEQ® is Copyright © 2010, Chmura Economics & Analytics. JobsEQ is protected by U.S. Patent 7,480,659; and patents pending.

# 6. Economic and Fiscal Impact

This section first analyzes the economic impacts of Kentucky career colleges, both from their ongoing operation, as well as capital expenditures, followed by an analysis of the tax revenues generated by college operations and capital expenditures.

## 6.1. Economic Impact of Career College Operations

The operations of Kentucky's career colleges include the functions of instruction and academic services. The total operational revenues of Kentucky career colleges are termed direct impact, and the resulting benefits to other Kentucky businesses are classified as indirect and induced impacts. For example, the direct impact of a university bookstore is the total sales of the bookstore. The indirect impact measures increased sales of other local businesses that provide supplies to the bookstore. The induced impact measures the increased purchases from the college faculty and staff who spend their wages at Kentucky retail shops, restaurants, and other such firms.

Table 6.1 provides details regarding operational revenues and expenditures of Kentucky career colleges for the academic year 2009-10. The total revenue for all career colleges reached $267.9 million for the year. Total revenues for 4-year career colleges were $147.8 million, while those for 2-year colleges were $118.6 million. The total expenses of all Kentucky career colleges reached $220.5 million in the 2009-10 academic year, with 40% of them spent on instruction, and 59% spent on academic support. In addition, career colleges in Kentucky employed 3,125 faculty and staff members for the 2009-10 academic year.

**Table 6.1: Kentucky Career College Operation Revenue and Expenses**

| | Less than 2-year | 2-year | 4-year | Total Career Colleges |
|---|---|---|---|---|
| **Total Revenues** | **$1,513,148** | **$118,619,734** | **$147,776,758** | **$267,909,640** |
| Tuition and fees | $923,320 | $104,297,231 | $125,950,231 | $231,170,782 |
| State and local appropriation | $0 | $1,351,031 | $2,802,255 | $4,153,286 |
| Other sales and services | $85,496 | $3,321,950 | $2,644,909 | $6,052,355 |
| Other revenues | $504,332 | $9,649,521 | $16,379,363 | $26,533,217 |
| **Total Expenses** | **$1,626,339** | **$98,224,109** | **$120,662,623** | **$220,513,071** |
| Instruction | $617,559 | $46,377,807 | $39,113,632 | $86,108,998 |
| Academic support | $809,712 | $50,236,419 | $77,475,384 | $128,521,515 |
| Other expenses | $199,068 | $1,609,884 | $4,073,607 | $5,882,559 |
| **Total Employment** | **39** | **1,297** | **1,789** | **3,125** |

Source: IPED

The direct revenues of Kentucky career colleges ($267.9 million) are input into the IMPLAN model to estimate the indirect and induced impacts of the career college operations in the state of Kentucky.[35]

The total annual economic impacts of career college operations in Kentucky are summarized in Table 6.2. The total annual economic impacts (direct, indirect, and induced) of college operations are estimated to have been $454.1 million in academic year 2009-10, which supported 4,140 Kentucky jobs. Of this, $267.9 million are direct impact. The direct employment impact is the number of people employed by Kentucky career colleges (at 3,125) in the 2009-10 academic year. Indirect impacts are estimated to have been $86.2 million and 456 jobs among other

[35] *IMPLAN Professional* is an economic impact assessment modeling system. It allows the user to build economic models to estimate the impacts of economic changes in states, counties, or communities. Please see Appendix 3 for more details.

businesses within the state that support college operations. Induced impacts are estimated to have been $99.9 million and 559 jobs in the state for academic year 2009-10, mostly among consumer-related business in the state such a retail shops and restaurants.

| Table 6.2: Annual Economic Impact of Career College Operation in Kentucky (2009-10 Academic Year) | | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total Impact |
| Spending Impact ($MM) | $267.9 | $86.2 | $99.9 | $454.1 |
| Employment Impact | 3,125 | 456 | 559 | 4,140 |
| Note: Numbers may not sum due to rounding | | | | |
| Source: IMPLAN Pro 2009 and Chmura | | | | |

## 6.2. Economic Impact of Career College Capital Expenditure

In addition to ongoing operations, career colleges also invest millions of dollars each year in capital investment projects that generate significant economic impacts in the state. This is especially true in recent years, as career colleges have experienced phenomenal growth that necessitated campus expansion and other capital investment.

Data from the Chmura career college survey indicate that, for the 12 colleges who responded to the survey, $19.6 million was spent on capital expenditures in the past five years, averaging $270 per enrolled student per year. Since the surveyed colleges accounted for 55% of total career college enrollment in Kentucky, assuming other career colleges also conducted similar levels of investment in their infrastructure, the estimated capital expenditure for all Kentucky career colleges would reach $35.4 million in the past five years, averaging $7.1 million per year. The capital expenditure was entered into the corresponding sectors in the IMPLAN model to estimate job creation and the ripple economic effects throughout the state.

Table 6.3 presents the total economic impact of Kentucky Career College capital expenditures in the past five years, as well as the annual impact estimated for the academic year 2009-10. The total economic impacts (direct, indirect, and induced) of Kentucky career college capital expenditures for the 2009-10 academic year are estimated to have been $10.3 million that supported 92 jobs in the state. Of this impact, $6.1 million was the direct impact that created 57 jobs,[36] mostly in construction trades and related engineering services. Indirect impacts are estimated to have been $2.1 million and 15 jobs among other businesses within the state that support capital expenditures. Induced impacts are estimated at $2.1 million and 20 jobs, mostly among consumer-related businesses in the state.

| Table 6.3: Economic Impact of Career College Capital Expenditures in Kentucky | | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Annual Average (2009-10 Academic Year) | | | | |
| Spending ($Million) | $6.1 | $2.1 | $2.1 | $10.3 |
| Employment | 57 | 15 | 20 | 92 |
| Five Year Total | | | | |
| Spending ($Million) | $30.7 | $10.3 | $10.7 | $51.7 |
| Employment | 295 | 80 | 102 | 476 |
| Source: Chmura Economics & Analytics and IMPLAN Pro 2009 | | | | |

[36] This number is smaller than $7.0 million annual expenditure, because some of those dollars may be spent outside Kentucky. Chmura uses the IMPLAN model to estimate the percentage of capital expenditure spent outside the state.

Combining operation and capital expenditure, the annual economic impact of Kentucky career colleges can reach $464.4 million, which supports 4,232 jobs in the Commonwealth of Kentucky.

## 6.3. Fiscal Impacts of Kentucky Career Colleges

Unlike public colleges or private non-profit colleges, which are tax exempt, Kentucky career colleges also generate significant revenues for the state governments. For this study, only taxes from the direct impacts are estimated.[37]

From capital expenditures, the state government benefits through increased individual and corporate income taxes as a result of new jobs created by the capital expenditure of Kentucky career colleges. The average state individual tax rate is 5.8%. The annual individual income taxes are estimated to have been $108,642 per year. In addition, corporate income taxes for state government are estimated as $16,191 for academic year 2009-10.

**Table 6.4: Annual State Tax Revenues From Kentucky Career Colleges**

| | Tax from Capital Expenditure | Tax From Operation |
|---|---|---|
| Sales Tax | - | $2,553,630 |
| State Individual Income | $108,642 | $6,871,758 |
| State Corporate Income | $16,191 | $1,204,999 |
| Total | $124,833 | $10,630,387 |

Source: Chmura Economics & Analytics

Kentucky career colleges directly employ thousands of faculty and staff members from which the state government receives individual income taxes based on their wages and salaries. The average state individual tax rate is 5.8%. For the state government, individual income taxes are estimated at $6.9 million for academic year 2009-10 based on the estimated total payroll at career colleges.[38] The state corporate income tax is estimated to be $1.2 million per year, based on the corporate tax rate of 5%. Kentucky has a 6% sales tax, which will be applied to sales of books and supplies (which is exempt for public colleges). The average spending on books and supplies was $1,628 per year for Kentucky career college students, which implies that annual sales tax revenue for Kentucky state government was $2.6 million in academic year 2009-10. The total state tax revenues from Kentucky career colleges could reach $10.6 million in the 2009-10 academic year.

Combining operation and capital expenditure, Kentucky career colleges can generate $10.8 million tax revenues each year for the Kentucky state government.

[37] This approach is recommended by Burchell and Listokin in *The Fiscal Impact Handbook*.

[38] Source for Kentucky sales, individual, and corporate income tax are from the Tax Foundation. http://www.taxfoundation.org/taxdata/show/230.html

# 7. Return on Investment Analysis

The return on investment (ROI) of Kentucky's career colleges is estimated from the perspective of both student and federal and state taxpayers. Students' lifetime ROI takes into account the expected wages in their post-college occupations, the cost of education and training, and the education completion time. Taxpayer ROI analysis takes into account the required taxpayer support as well as increases in income and retail sales taxes based on students' higher incomes after graduation or training completion.

## 7.1. Return on Investment for Students

### 7.1.1. Benefits for Students

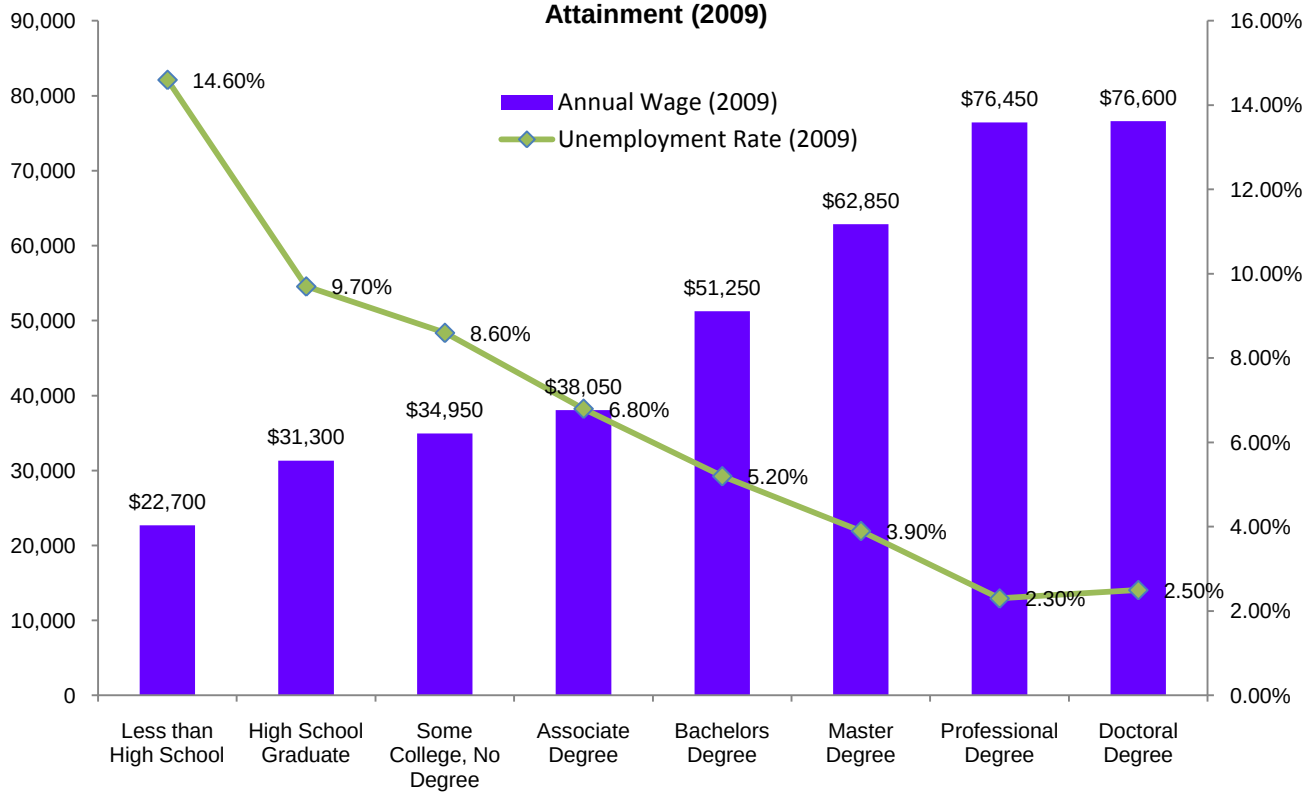
Theories on labor economics conclude that there are two main benefits associated with higher educational attainment: higher income and better access to the labor market in the form of lower unemployment.[39]

The national average annual wage in 2009 was $38,700. Higher educational attainment is associated with higher levels of income, as shown in Figure 7.1. The average annual wage for high school graduates was $31,300 in 2009, compared with $38,050 for those with associate degrees and $51,250 for those with bachelor's degrees. Consequently, the benefit from additional schooling is an average $6,750 per year for those getting an associate's degree and $19,950 per year for high school graduates obtaining a bachelor's degree.

Moreover, workers with higher educational attainment are also less likely to be unemployed (Figure 7.1). In 2009, the average unemployment rate for high school graduates was 9.7% compared with 6.8% for those with associate's degrees and 5.2% for workers with bachelor's degrees. The additional education and training resulted in an average 2.9 percentage point reduction in the unemployment rate for those getting an associate's degree, and a 4.5 percentage point reduction in the unemployment rate for those high school graduates with a bachelor's degree.

[39] *Labor Economics*, McGraw-Hill Irwin, Fifth Edition, by George Borjas.

**Figure 7.1: National Average Wages and Unemployment Rate by Educational Attainment (2009)**




Source: IPEDS

## 7.1.2. Student Costs and Return on Investment

The cost of education for students is mainly the upfront tuition. For students who borrow money to finance their education, an additional cost is incurred due to the payment of interest on student loans after graduation. Furthermore, while attending college, students forgo two or four years of income that they would have earned had they not attended school.

As shown in section 3.4, tuition at Kentucky's career colleges averaged $12,777 per year in the 2009-2010 academic year. On average, career colleges have higher tuition than both community colleges (average $2,996) and public 4-year institutions based upon the in-state rate of tuition ($6,855), without considering state subsidies.

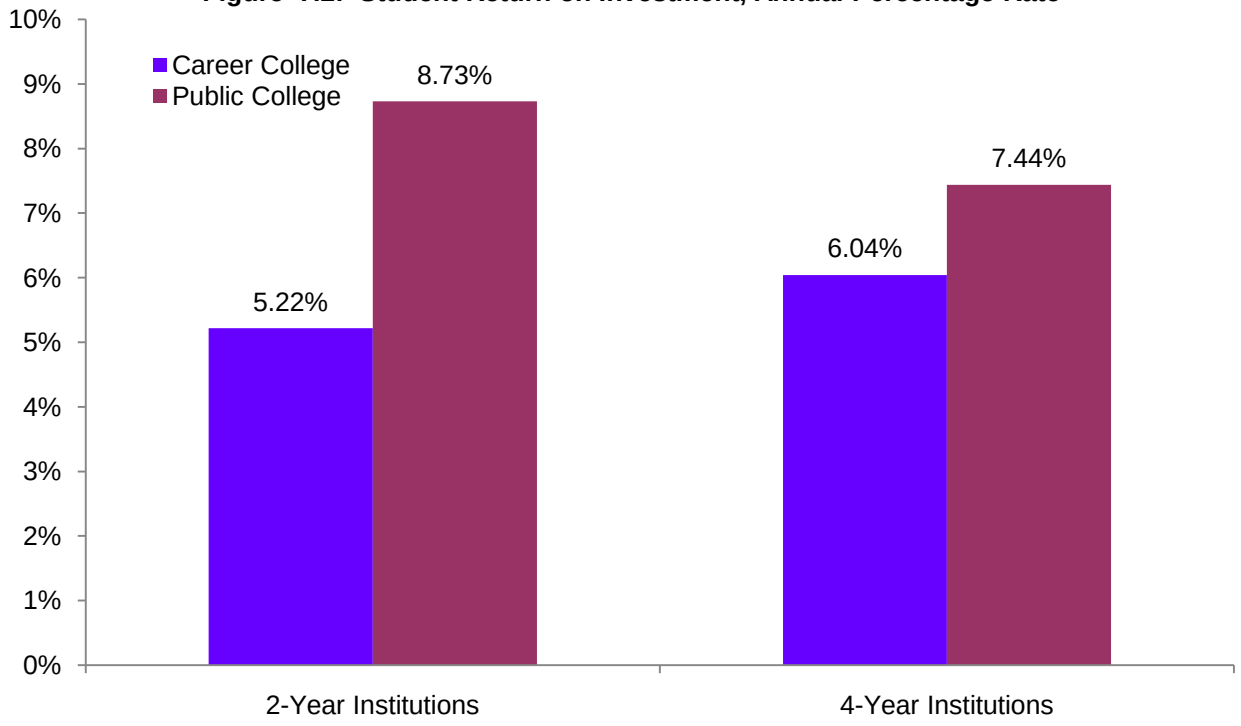
The forgone income while students are attending college is assumed to be the average income of high school graduates. It is possible that some students enrolled in 4-year colleges may have an associate's degree and require less time to complete their degree. This scenario is not considered here as a majority of students enroll in either 2-year or 4-year college right after high school. For career colleges, even though many of them work for a period of time before entering college, their pre-college income will be equivalent to that of workers with a high school education. Thus, using the average income of high school graduates as forgone income is appropriate. In calculating forgone income, the forgone income for part-time students is assumed to be zero, as they are assumed to work while attending college.

Section 3.5 provided a summary of the financial aid structure for an average Kentucky student in higher education. For students in career colleges, the average loan amount was $6,173 per year in the 2009-2010 academic year. The average loan amount was $1,205 per year for 2-year public college students and $2,899 per year for 4-year

public college students. For this estimation, the interest rate for student loans is assumed to be 7.0% per year.[40] The loan repayment time is assumed to be 12 years for students attending 2-year colleges and 20 years for students attending 4-year colleges.[41] In addition, it is assumed that after graduating, the student will retire at the age of 65.

Figure 7.2 presents the estimated return on investment for Kentucky's students. For students attending Kentucky's 2-year career institutions, the return on investment is 5.2% per year. For those attending 4-year career institutions, the ROI is 6.0% per year. These rates are higher than the prevailing interest rates—in March 2011, for example, the 30-year Treasury bond rate was 4.4%. Considering the current low-interest rate environment that has resulted from the recent recession, the historical average interest rate is a fairer comparison. The average rate for the 30-year Treasury bond since 2006 is 4.5%.[42] That means investing in career college education has a higher return than simply putting money in a saving account or investing in government bonds.

**Figure 7.2: Student Return on Investment, Annual Percentage Rate**




Source: Chmura Economics & Analytics

[40] The average interest rate is calculated based on the weighted average loan volume of Stafford Loans (6.8%), and PLUS loans (7.9% and 8.5%). U.S. Department of Education, Student Loans Overview, Fiscal Year 2011 Budget Request. Available at http://www2.ed.gov/about/overview/budget/budget11/justifications/t-loansoverview.pdf.

[41] The repayment length of loans is based on the loan amount. For loans below $10,000, the maximum term is 12 years. Source: GAO Office Testimony on Student Loan Programs, available at http://www.gao.gov/new.items/d04568t.pdf. For loans over $10,000 but below $20,000, the maximum term is 20 years. Since the average loan amount for career college students is over $5,000 per year, 12 and 20 are good estimates for students attending 2-year and 4-year colleges.

[42] Source: Board of Governors, Federal Reserve System.

However, the ROI for career colleges is lower than that of both 2-year and 4-year public colleges. The reasons are twofold. First, due to state appropriations and subsidies, the average tuition for Kentucky public colleges is less than Kentucky's career colleges. As a result, the upfront costs for students attending public colleges are much lower. Secondly, students attending career colleges are from households with relatively low incomes; yet, they receive very little state aid. As a result, they have to take on more debt to finance their education and thus will incur more interest payments throughout their careers, reducing the annual benefits.

Additionally, the ROI analysis does not take into consideration other non-monetary benefits that Kentucky's career colleges provide for their students. For example, many career college students are working adults who value the flexibility of attending college at night or on weekends. Adult students with children also value online classes as they can spend more time with their families. The current student ROI analysis does not account for the benefit of flexibility. Another non-monetary benefit is the value of access. Though the tuition at community colleges is lower, many of them have limited capacity to accommodate all students. Kentucky's career colleges provide immediate access to higher education for those students. If those non-monetary benefits are considered, the student's return on investment for Kentucky's career colleges will be much higher than those estimated here.[43]

## 7.2. Return on Investment for Taxpayers

### 7.2.1. Taxpayer Expenses for Education

Taxpayers support higher education in multiple ways. At the federal level, taxpayer support is in the form of federal grants to students (such as Pell Grants) as well as federal guarantees for student loans. For Kentucky taxpayers, aside from contributing to federal taxes, their state taxes also support state aid to students and direct state appropriations to public colleges. Table 7.1 details the taxpayer expenses for different types of postsecondary institutions in Kentucky.

At the federal level, most of the taxpayer cost to career college students is in the form of federal grants. An average enrolled student in Kentucky's 2-year and 4-year career colleges in the 2009-2010 academic year received $2,850 and $1,973, respectively, in federal grants. Those were higher than the $1,959 received by public 2-year college students and the $1,216 received by 4-year college students.[44]

[43] In a future study, a student survey can be implemented to evaluate those benefits.
[44] Private not-for-profit institutions are not included in this study.

| Table 7.1: Annual Tax Payer Costs and Benefits per Enrolled Student, 2009-10 Academic Year | 2-year Institutions | | 4-year Institutions | |
|---|---|---|---|---|
| | Career Colleges | Public Colleges | Career Colleges | Public Colleges |
| Federal Taxpayers | | | | |
| Direct aid to per enrolled | $2,850 | $1,959 | $1,973 | $1,216 |
| Cost of student loan default per enrolled | $872 | $414 | $942 | $259 |
| Federal corporate income tax per enrolled | $725 | $0 | $589 | $0 |
| Federal taxpayer cost per enrolled student | $2,997 | $2,373 | $2,326 | $1,475 |
| **Federal taxpayer cost per graduated student** | **$4,926** | **$9,624** | **$3,957** | **$3,277** |
| Kentucky Taxpayers | | | | |
| Direct aid to per enrolled | $117 | $1,091 | $408 | $1,928 |
| State appropriations per enrolled | $119 | $1,665 | $174 | $8,672 |
| State corporate income tax per enrolled | $104 | $0 | $84 | $0 |
| State sales tax on books/supplies per enrolled | $102 | $0 | $95 | $0 |
| **Kentucky taxpayer cost per enrolled in-state student** | **$30** | **$2,757** | **$403** | **$10,600** |
| **Kentucky taxpayer cost per graduated in-state student** | **$49** | **$11,179** | **$686** | **$23,541** |
| **Total taxpayer cost per enrolled student** | **$3,026** | **$5,130** | **$2,729** | **$12,075** |
| **Total taxpayer cost per graduated student** | **$4,975** | **$20,803** | **$4,643** | **$26,817** |
| Source: Chmura Economics & Analytics | | | | |

For students in career colleges, the average loan amount was $6,173 per year in the 2009-2010 academic year. The average loan amount was $1,205 per year for 2-year public college students and $2,899 per year for 4-year public college students. The student loans are guaranteed by the federal government. If a student repays his or her loan after graduation, there will be no cost for taxpayers. The federal guarantee for student loans becomes a cost to taxpayers only when students default on their loans. Due to the fact that more students in career colleges are from low-income households, it is not surprising that the student loan default rate is higher for career college students.[45] The latest default data for fiscal year (FY) 2008 indicated that the default rate for 2-year institutions was 12.6% for career colleges and 10.1% for public colleges. The default rate for 4-year institutions was 10.9% for career colleges and 4.4% for public colleges.[46] Based on this information, the annual taxpayer cost due to loan default is estimated to be $872 per enrolled student for 2-year career colleges and $414 per enrolled student for public 2-year colleges—lower because these students in public colleges take on much smaller loans. For the average student in 4-year institutions, the taxpayer cost due to loan default is $942 for career colleges and $259 for public colleges.

Career colleges pay federal corporate taxes that offset some of the taxpayer expenses. The current federal corporate tax rate is 35% of net income.[47] Based on revenue and expenses data from IPEDS for the 2009-2010

[45] Default rates are tied to the student's poverty status because higher-income families sometimes help students pay their loans to avoid default. Low-income families are less likely to do so. Also, career students, because they are from relatively low-income households, take on larger loans with larger monthly payments, which could increase the probability that they might not be able to make the payment.

[46] Source: Official Cohort Default Rates for Schools FY2008. Available at: http://www2.ed.gov/offices/OSFAP/defaultmanagement/instrates.html

[47] Source: The Tax Foundation website, available at: http://www.taxfoundation.org/files/corptaxrates_usvsoecd_state&fed-20091201.pdf. This is the nominal rate, without considering deductions companies may have.

academic year, it is estimated that the annual average profit was $2,072 per enrolled student for Kentucky's 2-year career colleges and $1,683 per enrolled student for 4-year career colleges. That translates into annual federal tax income of $725 per enrolled student from Kentucky's 2-year career colleges and $589 per enrolled student from 4-year career colleges.

In total, federal taxpayers pay an annual cost of $2,997 per enrolled student for Kentucky's 2-year career colleges and $2,326 per student for Kentucky's 4-year career colleges. By comparison, federal taxpayers pay $2,373 per student for Kentucky's community colleges and $1,475 per student for public 4-year colleges. Factoring the graduation rate differences, the federal taxpayer cost is $4,926 per graduated student for 2-year career colleges compared to $9,624 per graduated student for Kentucky's community colleges. Federal taxpayers spend much more on community college graduates. By contrast, federal taxpayers spend less on public 4-year college graduates compared to Kentucky 4-year career college graduates.

Kentucky taxpayers' costs for public colleges are in the form of state financial aid and direct appropriation. For career colleges, the costs are offset by state corporate income and sales taxes from Kentucky's career colleges. Since state appropriations and state aid are for Kentucky residents only, the cost to Kentucky taxpayers will focus on in-state students for public colleges.

Kentucky's career colleges receive very little from the state government. However, annual state appropriations averaged $1,665 per enrolled in-state student for 2-year colleges and $8,672 per enrolled in-state student for 4-year colleges in the 2009-2010 academic year. The low in-state tuition rates for public colleges are the result of state subsidies. In addition, state financial aid for in-state enrolled students averaged $1,091 per year for those in community colleges and $1,928 per year for those in 4-year public colleges in the 2009-2010 academic year.

Since career colleges are not tax-exempt like public colleges, the Kentucky state government benefits from corporate income taxes from career colleges. The current state corporate tax rate is 5% of net income.[48] Based on revenue and expense data from IPEDS for the 2009-2010 academic year, it is estimated that annual state corporate income taxes were $104 per enrolled student for 2-year career colleges and $84 per enrolled student for 4-year career colleges.

In total, in the 2009-2010 academic year, the Kentucky taxpayer cost was $30 per enrolled student from 2-year career colleges and $403 per enrolled student from 4-year career colleges. In contrast, Kentucky state taxpayers had costs of $2,757 per enrolled in-state student in community colleges and $10,600 per enrolled in-state student in public 4-year colleges. Factoring in differences in graduation rates, it costs Kentucky taxpayers $11,179 per year to educate one community college graduate and $23,541 per year to educate one 4-year college graduate.

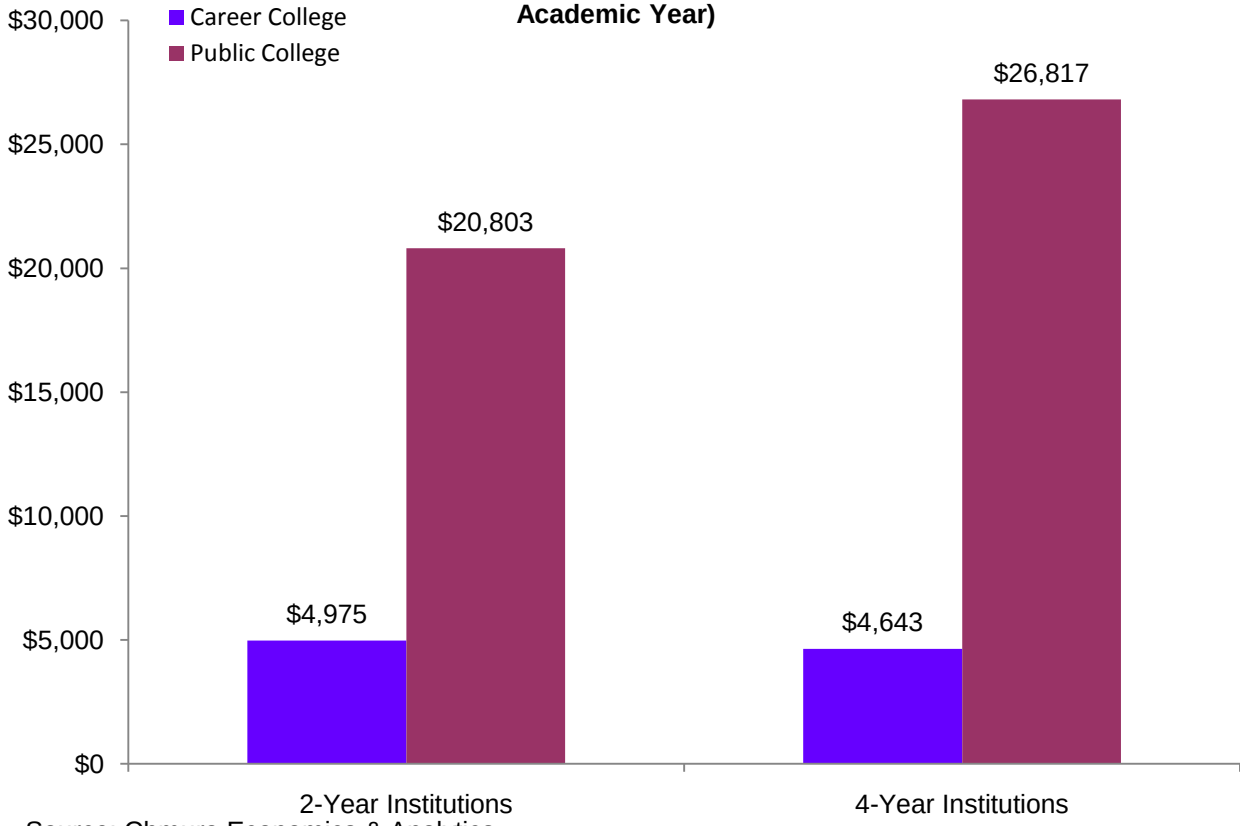
Combining state and federal support for higher education together, the annual taxpayer expenses on a per enrolled student basis are lower for career college students. In the 2009-2010 academic year, the annual taxpayer expenses were $3,026 for 2-year career college students, less than the $5,130 per year for students in Kentucky's community colleges. For 4-year institutions, the annual taxpayer expenses were $2,729 for career colleges, which was less than a quarter of the $12,075 average for each public college student.

---

[48] Source for Kentucky sales, individual, and corporate income tax are from the Tax Foundation. http://www.taxfoundation.org/taxdata/show/230.html

On a per graduated student basis, the taxpayer expenses were $4,975 per year for 2-year career colleges and $20,803 per year for Kentucky's community colleges (Figure 7.3). For 4-year institutions, the taxpayer expenses were $4,643 per year for career colleges and $26,817 for public colleges. The taxpayer expenses for career colleges were 23.9% of their public counterparts for 2-year institutions and 17.3% for 4-year institutions.

**Figure 7.3: Annual Taxpayer Expenses per Graduated Student (2009-10 Academic Year)**




Source: Chmura Economics & Analytics

## 7.2.2. Return on Investment for Taxpayers

The taxpayer expenses for both career colleges and public colleges can be interpreted as their investments for educating students when they are in college. Those investments will bring future benefits as graduating students become more productive in the workforce. More productive citizens can earn more income, which in turn will benefit taxpayers in the form of future income and sales taxes. As a result, the ROI for taxpayers includes the estimated future return of taxpayer investment in current students.

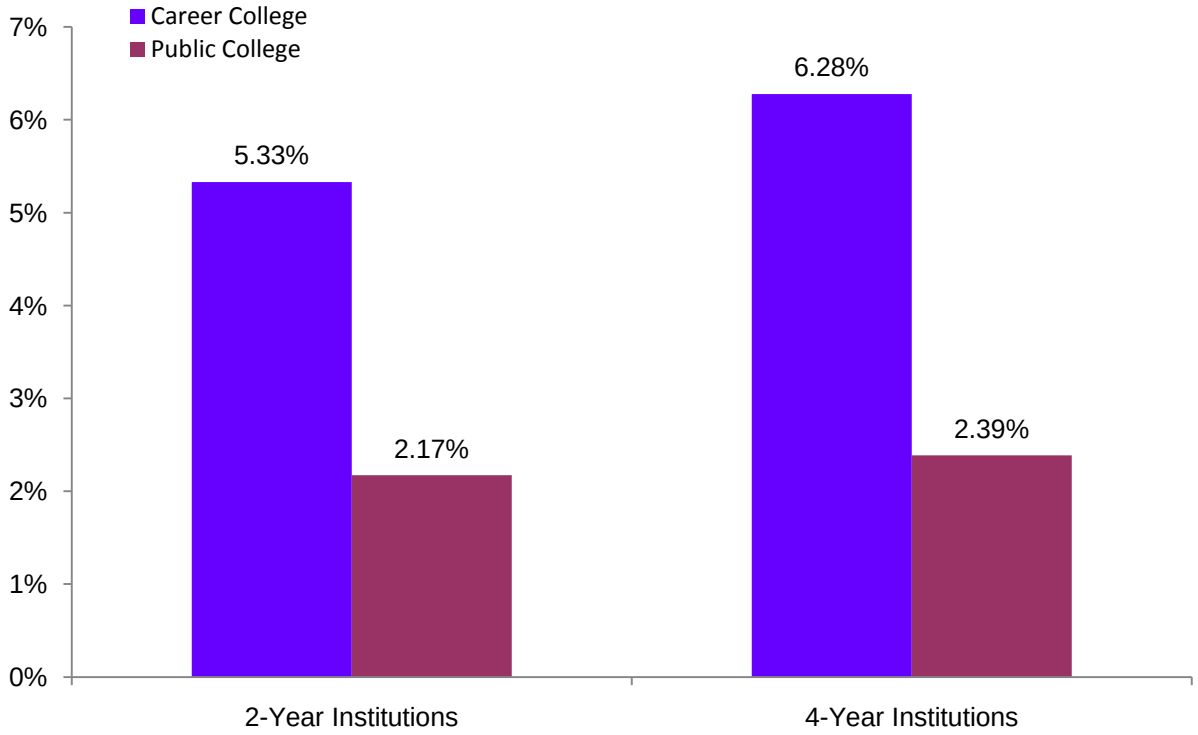
The annual total taxpayer costs per graduated student are estimated in Section 7.2.1. For 2-year career colleges, it is assumed that an average student attends school for two years. For 4-year colleges, it is assumed that an average student is in school for 4 years.[49]

[49] Despite the trend that it is taking longer for students to graduate from college, this study uses a 4-year timeframe for 4-year institutions, as it is still the most common number of years for students to graduate.

After graduating from college, these graduates are expected to earn higher wages. As shown in Section 7.1, the average annual wages for high school graduates were $31,300 in 2009 compared with $38,050 for those with associate's degrees and $51,250 for workers with bachelor's degrees. It is assumed that after graduation, students will retire at the age of 65.

The additional incremental income can bring in additional taxes for federal and state taxpayers. In this calculation, it is assumed that the federal income tax rate is 17.4% while the federal payroll tax rate (for social security, Medicare, and unemployment insurance) is 16.5%. The Kentucky individual income tax rate is 5.8%.[50] The increased income also implies increased spending on items subject to sales tax. According to spending patterns from the Consumer Expenditure Survey published by the U.S. Bureau of Labor Statistics, 31.5% of household spending is in sectors subject to state sales tax, which is 6% in Kentucky. Adding these taxes together, an individual with an associate's degree can contribute $2,994 more each year in tax revenue than a high school graduate. An individual with a bachelor's degree will contribute $8,452 more tax revenue per year than a high school graduate.

**Table 7.4: Taxpayer Return on Investment, Annual Percentage Rate**




Source: Chmura Economics & Analytics

Figure 7.4 presents the estimated return on investment for taxpayers (state and federal combined). For Kentucky 2-year career colleges, the return on investment for taxpayers is 5.3% per year. For 4-year career colleges, the ROI is 6.3% per year. Those rates are significantly higher than those for the respective public institutions which stand at 2.2% for community colleges and 2.4% for 4-year colleges. In this regard, Kentucky's career colleges provide cost-effective options for taxpayers when investing in higher education.

[50] Source: Internal Revenue Service and Tax Foundation.

# 8. Conclusion

In summary, Kentucky's career colleges represent an important customer and market segment for the higher education industry in the Commonwealth of Kentucky. They provide flexibility and practical curriculum for their students, many of whom are underserved by traditional colleges. Compared with their public counterparts, the career college student body represents more females, minorities, and adult students than that of traditional colleges. Kentucky's career colleges allow these otherwise underserved groups the ability to gain access to higher education.

Kentucky's career colleges make important contributions to the state economy. The economic impacts come from their ongoing operation and capital expenditure. Combined, the annual economic impacts of Kentucky career colleges are estimated to be $464.4 million (including direct, indirect, and induced), which can support 4,232 jobs for the 2009-10 academic year in the state. Career colleges also generated $10.8 million in tax revenues for the state government for the 2009-10 academic year. This is in sharp contrast to the tax-consuming public institutions and non-profit independent colleges that do not pay taxes.

Kentucky's career colleges are of critical importance to the state's workforce training output. Career colleges accounted for 11% of the postsecondary training in Kentucky during the 2009-2010 academic year and 12% of STEM occupations. For many occupations, career colleges in the Commonwealth provide a majority of the training.

Despite receiving very little state aid, Kentucky's career colleges are able to keep tuition at an affordable level. Several federal programs are accessible to students at career colleges such as direct aid and federal student loans. In Kentucky, the taxpayer cost per graduated student is much higher for students attending public colleges. Moreover, the taxpayer return on investment is higher for Kentucky's career colleges. In this regard, Kentucky's career colleges provide a cost-effective option for taxpayers when investing in higher education.

State appropriations and direct aid provide tremendous advantages for community colleges and public 4-year colleges in Kentucky. Despite this fact, the recent enrollment growth at Kentucky's career colleges shows that there is strong demand for such higher education institutions.

# Appendix 1: List of Kentucky Career Colleges

| ID | School Name | School Type |
|---|---|---|
| 237127 | Appalachian Beauty School | Private for-profit, 2-year |
| 447935 | ATA College | Private for-profit, 2-year |
| 156277 | Barrett and Company School of Hair Design | Private for-profit, 2-year |
| 444422 | Bellefonte Academy of Beauty | Private for-profit, 2-year |
| 421513 | Brown Mackie College-Hopkinsville | Private for-profit, 2-year |
| 157696 | Brown Mackie College-Northern Kentucky | Private for-profit, 2-year |
| 156444 | Collins School of Cosmetology | Private for-profit, 2-year |
| 455637 | Daymar College -Albany | Private for-profit, 2-year |
| 455646 | Daymar College -Scottsville | Private for-profit, 2-year |
| 447476 | Daymar College-Bellevue | Private for-profit, 2-year |
| 406219 | Daymar College-Louisville | Private for-profit, 2-year |
| 157465 | Daymar College-Owensboro Campus | Private for-profit, 2-year |
| 449302 | Daymar College-Paducah | Private for-profit, 2-year |
| 156903 | Daymar College-Paducah Main | Private for-profit, 2-year |
| 363439 | Draughons Junior College | Private for-profit, 2-year |
| 157614 | Empire Beauty School-Chenoweth | Private for-profit, 2-year |
| 157669 | Empire Beauty School-Dixie | Private for-profit, 2-year |
| 157650 | Empire Beauty School-Elizabethtown | Private for-profit, 2-year |
| 157678 | Empire Beauty School-Florence | Private for-profit, 2-year |
| 262660 | Empire Beauty School-Highland | Private for-profit, 2-year |
| 248305 | Empire Beauty School-Hurstborne | Private for-profit, 2-year |
| 156675 | Ezell's Cosmetology School | Private for-profit, 2-year |
| 156471 | Galen College of Nursing-Louisville | Private for-profit, 2-year |
| 248165 | Heads West Kentucky Beauty College | Private for-profit, 2-year |
| 248192 | Jenny Lea Academy of Cosmetology | Private for-profit, 2-year |
| 156949 | Jenny Lea Academy of Cosmetology | Private for-profit, 2-year |
| 456375 | MedTech College–Lexington Campus | Private for-profit, 2-year |
| 157395 | Mr. Jim's College of Cosmetology | Private for-profit, 2-year |
| 157456 | Nutek Academy of Beauty Inc. | Private for-profit, 2-year |
| 157508 | Pat Wilsons Beauty College | Private for-profit, 2-year |
| 156426 | Paul Mitchell The School-Lexington | Private for-profit, 2-year |
| 156842 | Paul Mitchell The School-Louisville | Private for-profit, 2-year |
| 156754 | PJ's College of Cosmetology | Private for-profit, 2-year |
| 156310 | PJ's College of Cosmetology | Private for-profit, 2-year |
| 446491 | Regency School of Hair Design | Private for-profit, 2-year |
| 248314 | Southeast School of Cosmetology | Private for-profit, 2-year |
| 245032 | Southwestern College | Private for-profit, 2-year |
| 157766 | Spencerian College | Private for-profit, 2-year |
| 433563 | Spencerian College-Lexington | Private for-profit, 2-year |

| | | |
|---|---|---|
| 156967 | The Salon Professional Academy | Private for-profit, 2-year |
| 245069 | Trend Setters Academy of Beauty Culture-Elizabethtown | Private for-profit, 2-year |
| 157827 | Trend Setters Academy-Louisville | Private for-profit, 2-year |
| 247065 | Beckfield College | Private for-profit, 4-year or above |
| 157599 | Brown Mackie College-Louisville | Private for-profit, 4-year or above |
| 454209 | DeVry University-Kentucky | Private for-profit, 4-year or above |
| 448488 | ITT Technical Institute-Lexington | Private for-profit, 4-year or above |
| 413857 | ITT Technical Institute-Louisville | Private for-profit, 4-year or above |
| 157021 | National College-Lexington | Private for-profit, 4-year or above |
| 157270 | Sullivan College of Technology and Design | Private for-profit, 4-year or above |
| 157793 | Sullivan University | Private for-profit, 4-year or above |
| 445391 | University of Phoenix-Louisville Campus | Private for-profit, 4-year or above |
| 367103 | Interactive College of Technology | Private for-profit, less than 2-year |
| 450632 | Lexington Healing Arts Academy | Private for-profit, less than 2-year |
| 131803 | Strayer University | Private for-profit, 4-year or above |

# Appendix 2: Detailed Occupation Impact of Kentucky's Career Colleges

Table 5.2: Top Forty Detailed Occupations of Kentucky's Career College Training Impact, 2008-2009 Academic Year

| SOC | Title | Career College Training Impact | Impact of Other Kentucky Schools | Total Kentucky Training Impact | % of Impact Due to Career Colleges | STEM | Kentucky Training Concentra-tion |
|---|---|---|---|---|---|---|---|
| 39-5012 | Hairdressers, Hairstylists, and Cosmetologists | 815 | 84 | 899 | 91% | | 1.39 |
| 31-9092 | Medical Assistants | 485 | 402 | 887 | 55% | | 0.69 |
| 29-2061 | Licensed Practical Nurses | 425 | 3,225 | 3,650 | 12% | | 4.51 |
| 29-1111 | Registered Nurses | 354 | 2,814 | 3,168 | 11% | ✓ | 1.23 |
| 11-1021 | General and Operations Managers | 345 | 1,540 | 1,885 | 18% | | 1.02 |
| 43-6013 | Medical Secretaries | 238 | 393 | 631 | 38% | | 2.84 |
| 31-9011 | Massage Therapists | 230 | - | 230 | 100% | | 2.36 |
| 35-2014 | Cooks, Restaurant | 161 | 143 | 304 | 53% | | 1.46 |
| 13-1111 | Management Analysts | 140 | 625 | 765 | 18% | | 0.94 |
| 17-3023 | Electrical and Electronic Engineering Technicians | 134 | 16 | 150 | 89% | ✓ | 0.81 |
| 39-5092 | Manicurists and Pedicurists | 125 | 13 | 138 | 91% | | 1.46 |
| 29-2034 | Radiologic Technologists and Technicians | 114 | 122 | 236 | 48% | ✓ | 1.02 |
| 29-2055 | Surgical Technologists | 112 | 148 | 260 | 43% | ✓ | 1.88 |
| 39-5094 | Skin Care Specialists | 111 | 11 | 123 | 91% | | 1.00 |
| 33-1012 | First-Line Supervisors/Managers of Police and Detectives | 110 | 733 | 843 | 13% | | 1.41 |
| 29-2071 | Medical Records and Health Information Technicians | 107 | 89 | 196 | 55% | ✓ | 0.69 |
| 29-2052 | Pharmacy Technicians | 98 | 17 | 115 | 85% | | 0.53 |
| 23-2011 | Paralegals and Legal Assistants | 96 | 46 | 143 | 68% | | 1.16 |
| 29-2012 | Medical and Clinical Laboratory Technicians | 95 | 246 | 341 | 28% | ✓ | 4.58 |
| 15-1081 | Network Systems and Data Communications Analysts | 93 | 156 | 249 | 37% | ✓ | 1.45 |
| 17-3011 | Architectural and Civil Drafters | 91 | 146 | 237 | 38% | ✓ | 2.22 |
| 31-9091 | Dental Assistants | 91 | - | 91 | 100% | | 0.40 |
| 11-2022 | Sales Managers | 86 | 385 | 472 | 18% | | 0.96 |
| 11-9199 | Managers, All Other | 81 | 362 | 443 | 18% | | 0.99 |
| 15-1071 | Network and Computer Systems Administrators | 81 | 135 | 215 | 37% | ✓ | 1.43 |
| 13-2011 | Accountants and Auditors | 77 | 555 | 632 | 12% | ✓ | 0.90 |
| 25-1121 | Art, Drama, and Music Teachers, Postsecondary | 77 | 366 | 443 | 17% | | 0.98 |
| 11-1011 | Chief Executives | 64 | 284 | 348 | 18% | | 1.02 |
| 51-3011 | Bakers | 56 | - | 56 | 100% | | 0.91 |
| 11-3021 | Computer and Information Systems Managers | 56 | 92 | 148 | 38% | ✓ | 1.29 |
| 11-3011 | Administrative Services Managers | 54 | 243 | 297 | 18% | | 1.00 |
| 27-1024 | Graphic Designers | 54 | 55 | 109 | 49% | | 0.55 |
| 15-1021 | Computer Programmers | 52 | 60 | 112 | 47% | ✓ | 1.07 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 43-6011 | Executive Secretaries and Administrative Assistants | 50 | 893 | 943 | 5% | | 5.95 |
| 13-1051 | Cost Estimators | 49 | 220 | 269 | 18% | ✓ | 0.98 |
| 43-6014 | Secretaries, Except Legal, Medical, and Executive | 49 | 875 | 924 | 5% | | 6.01 |
| 29-1199 | Health Diagnosing and Treating Practitioners, All Other | 47 | - | 47 | 100% | ✓ | 0.37 |
| 11-3051 | Industrial Production Managers | 45 | 199 | 244 | 18% | | 1.03 |
| 11-9111 | Medical and Health Services Managers | 44 | 209 | 253 | 17% | | 0.56 |
| 15-1099 | Computer Specialists, All Other | 44 | 73 | 117 | 37% | ✓ | 1.47 |
| **TOTAL STEM (All Occupations)** | | **1,728** | **12,738** | **14,467** | **12%** | | |
| **GRAND TOTAL (All Occupations)** | | **6,406** | **52,122** | **58,527** | **11%** | | |

Source: Chmura Economics & Analytics

# Appendix 3: Impact Study Glossary

*IMPLAN Professional* is an economic impact assessment modeling system. It allows the user to build economic models to estimate the impacts of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific events on the overall economy.

*Input-Output Analysis*—an examination of business to business and business to consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

*Direct Impact*—economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

*Overhead*—construction inputs not provided by the contractor.

*Indirect Impact*—secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

*Induced (Household) Impact*—economic activity generated by household income resulting from direct and indirect impacts.

*Multiplier*—the cumulative impacts of a unit change in economic activity on the entire economy.

# Appendix 4: About Chmura Economics & Analytics

Chmura Economics & Analytics (Chmura) was founded by Christine Chmura in 1999. The firm is a women-owned small business with headquarters in Richmond, Virginia. Chmura currently has eight professional staff members plus temporary support staff. A branch office was opened in Cleveland, Ohio in 2005. The firm specializes in applied economic consulting, quantitative research, and software solutions requiring the integration of advanced economic analysis. Work has included workforce and economic development, site selection, and impact analysis. Chmura has completed over 100 economic impact studies over the past five years. Chmura publishes Virginia Economic Trends, now in its tenth year, electronic publications and forecasts available via chmuraecon.com, and custom publications. Software products include JobsEQ®, currently in widespread use by economic and workforce development agencies and educational institutions throughout the nation.

Chmura's multi-state client base includes economic developers, workforce practitioners, education reformers, firms seeking information and data to make sound decisions, governors and secretariats, chambers of commerce, lobbyists, developers, target marketers, counties and localities, firms and corporations seeking fiscal analysis for project and incentive-based discussions, as well as many other public and private entities with needs for credible information on a timely basis. Chmura served over 100 clients during the past two years with projects and services spanning a multitude of public and private entities. Furthermore, Chmura's online products currently serve over 9,000 international users and subscribers across the nation receive Chmura's weekly and quarterly publications.

A sampling of Chmura clients include:

- Association of Career Colleges in Virginia
- Council on Virginia's Future
- Knoxville Chamber of Commerce
- The Manufacturing Institute, National Association of Manufacturers
- Southwest Alabama Workforce Development Council
- State Council of Higher Education for Virginia
- Tompkins County Area Development
- University of the Mountains (Kentucky)
- U.S. Department of Commerce
- Virginia Commonwealth University
- Virginia Community College System

## Chmura Professional Staff

### Christine Chmura

PhD, President – Prior to founding Chmura Economics & Analytics, Chris was the Chief Economist at Crestar Financial Corporation and prior to that an Associate Economist at the Federal Reserve Bank of Richmond. She received her Ph.D. in Business with a major in Finance and a minor in Economics from Virginia Commonwealth University in Richmond, Virginia.

Chris currently serves on the Governor's Economic Advisory Board of the Commonwealth of Virginia, the Virginia Commonwealth University Foundation Board of Trustees, the Board of the National Association of Business Economics, and the Governor's Commission on Climate Change. She's been described by Virginia Newswire as "a regular on the Virginia speaking circuit, [she] has built a following around the Old Dominion as one of the few non-academic economists with in-depth knowledge of the state." (Workforce Wizardry, April, 2004).

### Leslie Peterson

Partner, Director of Operations, Project Manager - Leslie has a passion for rural economic development, a disciplined scientific approach to research and applications, a heightened sense of customer care, and a sharpened desire for straightforward communication. Leslie is currently working toward a Certificate in International Economic Development with Georgia Institute of Technology. Prior to joining Chmura, Leslie worked in the chemical industry, including ten years at EASTMAN Chemical Company where she served as a world-wide sales coordinator, holds a commercially viable patent, and worked on the team that brought Eastman the coveted Malcolm Baldrige Award. Leslie is a LEAD VIRGINIA 2007 alumna and serves on the Central Virginia Health Planning Agency Board in Chester, Virginia. Her professional memberships include the International Economic Development Council (IEDC), the National Association of Workforce Boards (NAWB) and the Virginia Association of Economic Developers.

### Xiaobing Shuai

PhD, Senior Economist - Dr. Shuai conducts model building and regional and macroeconomic trend forecasting. His interest rate forecasts are published in the "Blue Chip Financial Forecasts." A prior senior analyst with Capital One Financial Corporation, he studied at the University of Wisconsin-Madison and obtained an M.A. in Agricultural Economics and a Ph.D. in Economics. Xiaobing won the NABE 2005 Contributed Paper Award, published in Business Economics; this paper investigated the economic relationship between Virginia's center cities and their suburbs.

### Sharon Simmons

Sharon Simmons brings a love for economics and strong analytic and quantitative skills to Chmura. She enjoys finding creative approaches to solve problems. Sharon is extremely attentive to clients' needs and works diligently to produce a top quality work product. Prior to joining Chmura, Sharon worked for an intellectual property consulting firm. Her areas of expertise were intellectual property valuations and patent litigation. Before spending four years as an intellectual property consultant, Sharon was an Associate Economist at the Federal Reserve Bank of Chicago. Sharon is a graduate of the University of Virginia where she earned a Bachelor of Arts degree with Highest Distinction in Economics with a minor in Mathematics.

### John Chmura

Director of Information Technology - John Chmura created and maintained Chmura Economics & Analytics original information systems between 2000 and 2003. He temporarily left the firm between 2003 and 2005 to pursue his Master's in Computer Science from the School of Engineering at Case Western Reserve University with a specialization in Web and Data Mining. His expertise includes development and implementation of enterprise web and client/server systems, large relational databases systems, and data mining. John is a graduate of Kent State University in Kent, Ohio with a Bachelor's degree in Computer Information Systems. In December 2005, a paper written by John was published in the International Conference on Asian Digital Libraries meeting in Bangkok, Thailand.

### Greg Chmura

Senior Statistician & Executive Editor - Greg directs Chmura's survey research which includes design, implementation, and analysis of business and consumer surveys. Greg is editor of our publications which include the quarterlies *Virginia Economic Trends* and *Ohio Economic Trends*. Further, Greg works with our IT department in software design and testing, documentation, and training. He earned Bachelor's of Science degrees in Mathematics and Physics from Cleveland State University. In further studies he earned a Certificate of Secondary

Education. Greg was previously a professor at Cuyahoga Community College and has also worked in actuarial science.

**Donald Mackey**

Software Developer - Donald joined Chmura Economics & Analytics in 2008. Donald is a Graduate from DeVry University in Columbus, Ohio with a Bachelor's degree in Computer Information Systems. His experience includes database development and management as well as web and application development. Donald also has a background in the hospitality industry.