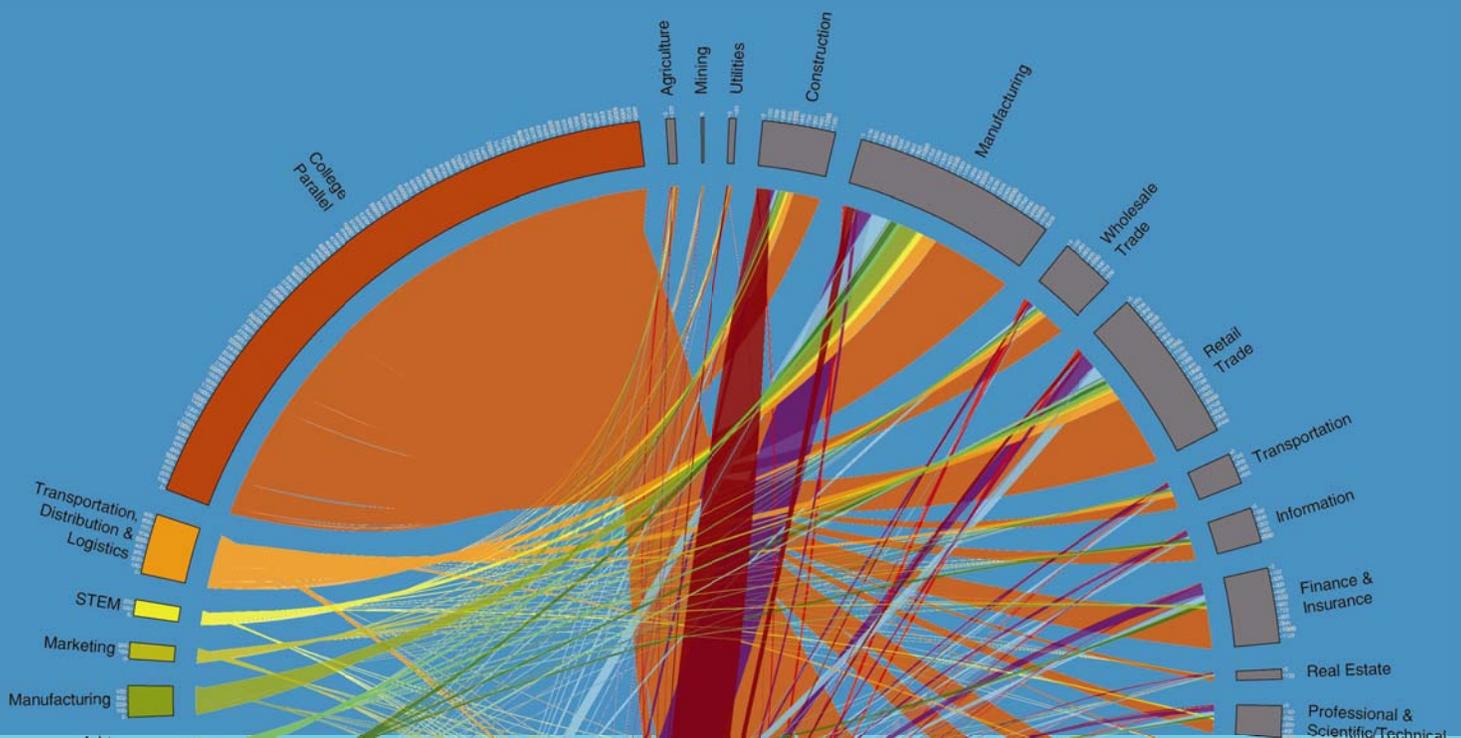


# ECONOMIC RETURNS & CAREER TRANSITIONS FOR IOWA COMMUNITY COLLEGE STUDENTS

A STUDY COMPLETED BY THE IOWA DEPARTMENT OF EDUCATION AND IOWA WORKFORCE DEVELOPMENT



Community colleges are often touted as a primary economic engine of the state. Iowa community colleges have long been the largest postsecondary system in the state of Iowa. Yet, neither state nor federal agencies have tracked the labor market outcomes for Iowa community college students.

The Iowa Department of Education and Iowa Workforce Development partnered to combine educational and workforce data. The collaboration led to the establishment of the Training and Employment Outcomes System (TEOS) which combines wage data with education records from community colleges. This report summarizes results on four areas: descriptive wage summaries; the returns to education; transitions from program majors to the workforce; and the five-year in-state retention rate of community college graduates.

The primary methodology employed was to compare wages of students who completed degrees (completers) to students who left without an award (leavers). The 2002 cohort of students were earning \$2,046 more than students who left by July 2008.

After considering the variety of costs that is required to complete a degree, the rate of return for completing a degree was six percent over a seven year period. The value of completing a community college degree is similar to the results from other national studies. This study, however,

sets an important precedent where state agencies can calculate the rate of returns without relying on national data sets.

Additional analysis shows the rate of returns varies greatly by career cluster. The rate of return to law; science, technology, engineering & mathematics (STEM); and finance majors are close to 50 percent. Architecture & construction; health science; and manufacturing majors have a rate of return that exceed 30 percent.

TEOS also contains the path from majors to the industrial sector of employment. College parallel students were a huge source of labor for the 2006 cohort. Three years after departing community colleges, students who were in programs designed to transfer comprised half of the labor force in almost every sector.

Besides college parallel, health sciences was the largest cluster of labor supply. Nearly all health science students transitioned into the health industry. By the third year, over 4,000 health science students were employed in Iowa.

Finally, IDE and IWD estimate that at least 80 percent of community college students remain in the state five-years after completing a community college degree. Over 9,000 students either worked or attended university in Iowa after completing their degree in 2001.

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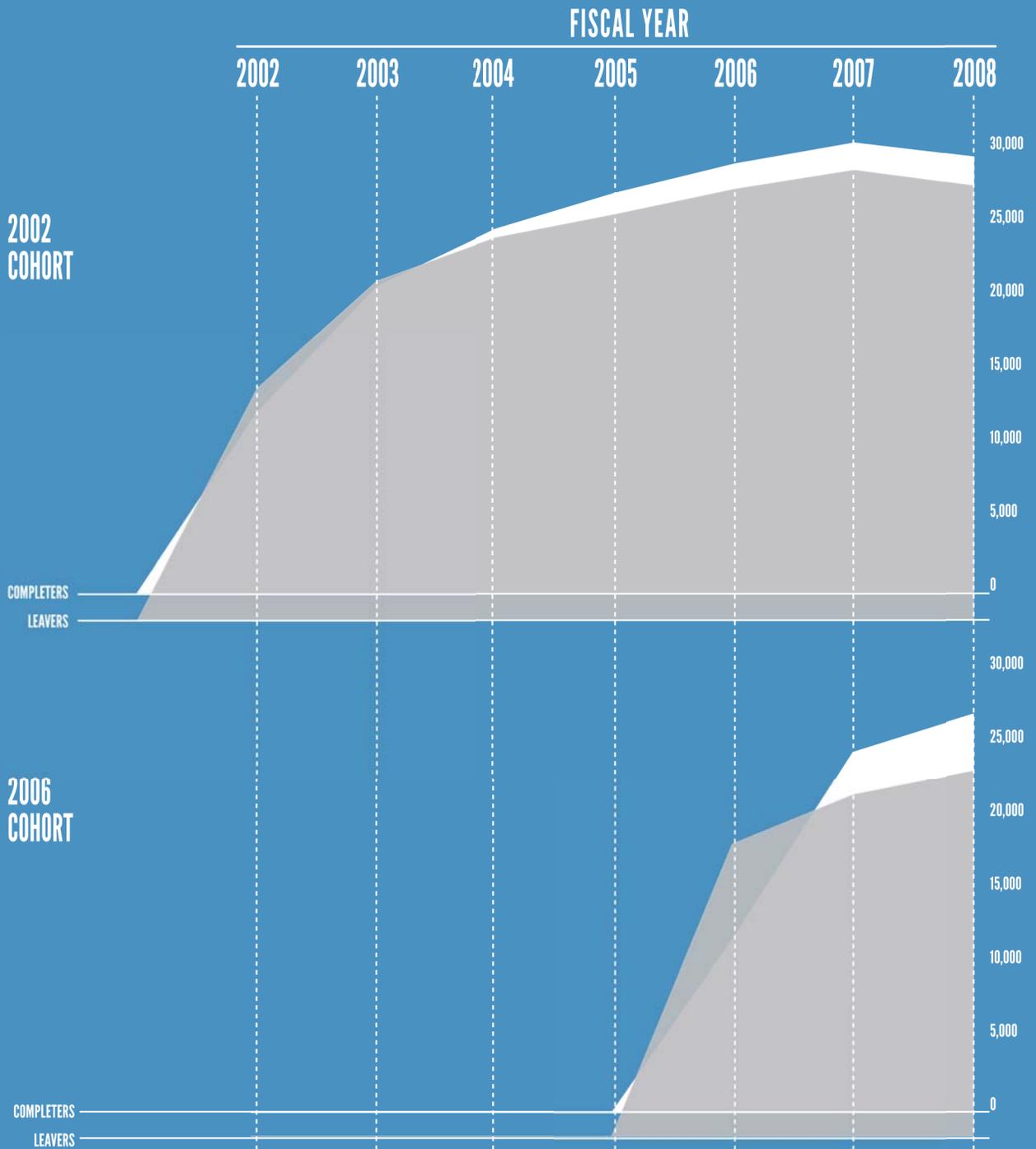
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# MEDIAN WAGES BY COHORT: 2002 - 2008



# INTRODUCTION & METHODOLOGY

Community colleges are often touted as a primary economic engine of the state. Indeed, Iowa community colleges enrolled 129,128 credit students and 269,393 noncredit students in the 2008-2009 academic year, making it the largest postsecondary system in Iowa.

The role of education in national workforce development has been well-documented over the last fifty years. Namely, students with greater education typically earn higher wages. The difference in educational attainment has contributed to two-thirds of the raise in wage inequality since the 1970s.<sup>1</sup> Typically, each year of education returns ten percent to wages over a worker's lifetime. Nationally, completing a community college degree versus leaving early returns between 6 and 14 percent.

Educated workers also enjoy lower unemployment rates. For instance during the recent recession in 2008, Bachelor's degree holders had a 2.8 percent unemployment rate compared to a 5.7 percent unemployment rate for those with a high school diploma. Those with an Associate's degree had a 3.7 percent unemployment rate.<sup>2</sup>

Additional studies have shown educated workers tend to be healthier, thus paying less in health care and less reliant on public health programs. They are less likely to be incarcerated and their children are also more likely to obtain higher education and higher earnings.

How has Iowa community colleges contributed to Iowa's workforce? The Iowa Department of Education and Iowa Workforce Development have collaborated to join databases to track workforce outcomes of community college students.

The role of education in workforce development is an expansive area of study. The scope of this study is limited to four questions:

1. What are the wages of recent Iowa community college graduates?
2. Does completing a community college degree in Iowa provide an economic benefit to the individual student?
3. What sectors of the economy are provided labor from Iowa community colleges?
4. Do Iowa community college graduates remain in the state's labor force?

## Methodology

This report tracks completers and leavers from two cohorts from the 2001-02 academic year (herein the 2002 cohort) and the 2005-06 academic year (herein the 2006 cohort). Completers are students who graduated from an Iowa community college with an Associate's, certificate, or diploma. Leavers are students who left community college before completing a degree.

The wages are obtained from the Training and Employment Outcomes System (TEOS), a shared education and workforce dataset created by the Iowa Department of Education and Iowa Workforce Development. TEOS is created through several steps. First, the Iowa Department of Education uses the Community College MIS to choose a cohort of students who completed a degree in either 2002 or 2006 and a cohort of leavers from the prior year.

The Iowa Department of Education ensures these students have not entered in postsecondary education elsewhere. The remaining students are sent to Iowa Workforce Development to be matched with Unemployment Insurance (UI) records. UI records contain the earnings of wages in many sectors of the economy. Earnings are then aggregated for each year between July 1<sup>st</sup> and June 30<sup>th</sup>. The final dataset, TEOS, is shared between both departments to conduct research.

## *A Description of* STUDENT WAGES

Page 3 contains median wages for both cohorts used in this study. Although leavers initially benefits from leaving school early, wages for degree holders outpace and eventually exceed the earnings of leavers. For instance, wages for the 2002 cohort were \$12,224 in 2002, \$2,539 less than leavers. But over the next seven years, wages for degree holders grew 142.1%. By 2004, degree holders earned slightly more than leavers and by 2008, completers earned \$1,917 more than leavers.

The 2006 cohort shows a similar trend. Degree holders earn less as they complete their degree. After graduation, they find higher paying jobs and see tremendous year-to-year earnings growth. By 2008 degree holders earn more than leavers and wage growth mirrors that of the 2002 cohort.

## The 2008 Recession

Iowa's unemployment started to increase and wages began to fall in 2008. Personal income fell from \$112 million in the first quarter of 2008 to \$109 million the following year. In the same period, unemployment rose of 3.8% to 5.2%. As of February,

*(Continued on page 5)*

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Iowa’s unemployment rate was 6.7 percent.<sup>3</sup>

The beginning of the recession is reflected in median wages. Between 2007 and 2008, wages fell for completers and leavers in both cohorts. Within TEOS, the decline of median wages is not indicative of workers who did not earn wages. However, it reflects those who took a pay-cut, were fired and re-employed at a lower-paying job, or a loss in working hours.

The percent decline in wages was equivalent between completers and leavers. Degree-holders were not immune to the state- and nationwide contraction of wages.

**Wages by Degree Type**

Iowa community colleges offer several different degrees, each with an specific intent and duration. Colleges award seven different Associate’s degrees: Associate’s of Applied Science (AAS); Associate’s of Arts (AA); Associate’s of Science (AS); Associate’s of General Studies (AGS); and Associate’s of Applies Arts (AAA). Community colleges are also authorized to offer shorter programs that terminate with a Certificate or Diploma.

Generally, Associate’s degrees require two years of education.

However, each Associate’s degree has a different mission. The AAS and AA are the two most widely awarded degrees in Iowa community colleges.<sup>4</sup> The AAS is an award designed to lead students into employment after completion. Students are trained for particular occupations in the workforce.

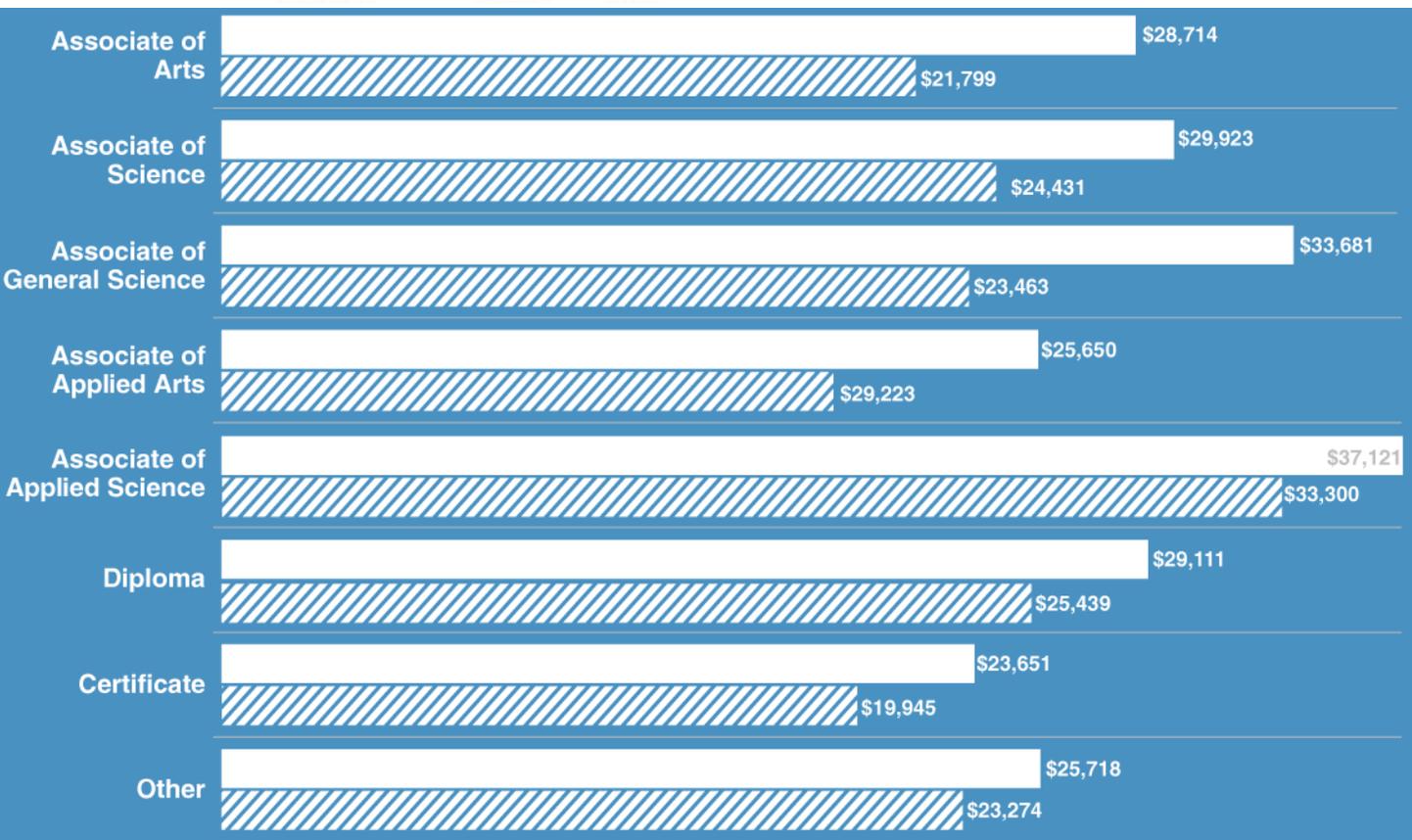
The AA is meant to prepare students to transfer to a four-year college to complete a Bachelor’s degree or more. Almost two-third of AA recipients transfer to a four-year university of college within three years of obtaining a degree.<sup>5</sup> By contrast, only 12 percent of AAS recipients transfer to a four-year institution. Students who transfer are not included in this report.

The figure below shows the median wages of completers by degree type. AAS recipients earn higher wages than recipients of any other community college degree. By 2008 the median earnings for AAS recipients was \$37,121, followed by \$33,681 for AGS; and \$29,923 for AS recipients.

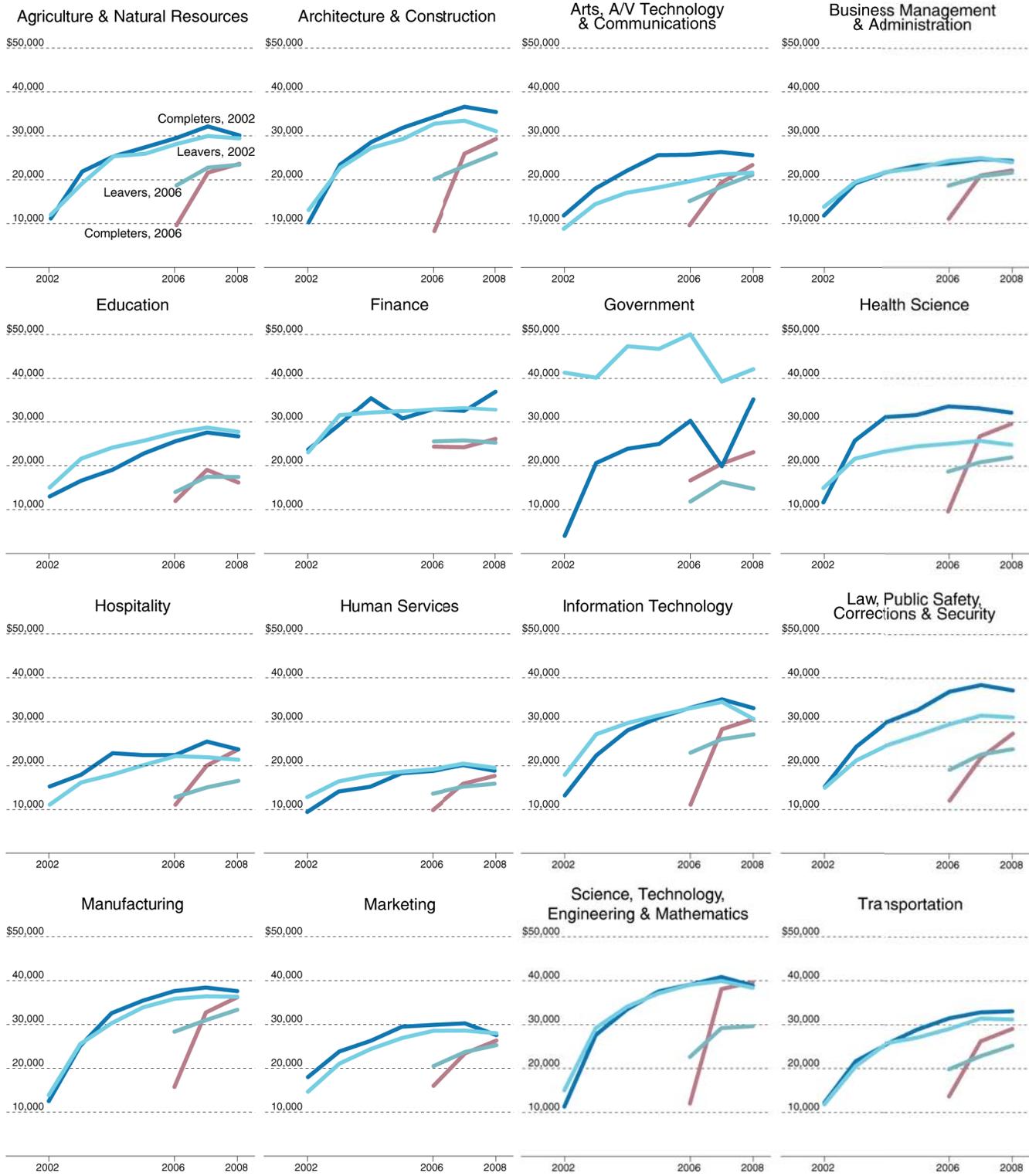
Students with diplomas—one-year programs—earn more than AA recipients. Like AAS programs, diploma programs prepare students for occupations after completion. Diploma recipients from 2002 earned \$29,111 seven years after graduation. AA

(Continued on page 7)

**MEDIAN WAGES FOR 2006 COHORT: 2006–2008**



# WAGES BY PROGRAM MAJOR



(Continued from page 5)

recipients earned slightly less with \$28,713 in 2008.

Thus, career preparatory awards, such as the AAS and diplomas, garner higher wages than students who enroll in AA programs but do not subsequently transfer.

### Wages by Programs

There is substantial evidence that wages vary by the program a student completes. Programs may yield differing wage levels based on local and national availability of labor in specific areas and the demand for educated workers will drive up wages in particular occupations. Page 7 and 8 presents median wages for completers

and leavers by career clusters.

Career clusters are aggregation on majors based on the major's intended career focus. For instance, the agriculture and natural resources cluster are majors whose focus is on developing farmers, agriculture scientists, agribusiness, animal production and veterinarians. Current and historical enrollment information for each career cluster is available from the Iowa Department of Education.<sup>6</sup>

By 2008, majors in science, technology, engineering, and mathematics (STEM); manufacturing; government; and health science had the highest wages for the 2002 cohort.

## RETURNS to DEGREE

What is a community college degree worth? The results indicate that community college completers earn more than those who leave. But students who seek more education also incur more tuition, forgo wages, and defer compensation until after graduation. The ultimate measure of the value of a community college degree is the *additional* income from completing a degree after accounting for the added cost. Specifically, the optimal measure is the personal returns to degree.

The personal rate of return for completing a community college degree was 6 percent.<sup>7</sup> That is, a student who invests a dollar in completing a community college degree will receive an additional six cents. Students who invest \$1,000 in completing a degree will receive an additional \$6. These returns are noted as personal since they only calculate the added benefit to the student and not society as a whole

Students invest in their education in three ways. First, students pay tuition to attended classes. Second, students forgo wages by attending class instead of working. Third, students must push higher earnings to later in life, which means students have a shorter period to enjoy higher wages.

Other studies indicate the returns to completing a community college degree, versus leaving early is between 6 and 14 percent.<sup>8</sup> Ultimately, these results indicate the dollar value of completing a community college degree was \$1,994. That is, students who obtained a degree in 2002 profited \$1,994 after accounting for the cost of tuition, loss wages while in school, and the time cost of deferring wages.

Thus, a student who is choosing between completing a degree and leaving early into the workforce should value the degree at \$1,994. Even though the student may think it is wise to enter the workforce early, skipping on additional schooling and tuition

payments, completing a community college degree is economically worthwhile.

### Returns by Program

The rate of return varies by the type of degree a student receives. The AAS, which is designed to lead to employment, had the highest rate of return of 55.7 percent. The AS—which provides an option between transfer and career—had an 18.1% rate of return and the AGS returned 12.4% over three years.

The return to the AAS degree amounts to an *additional* \$41,962 in economic benefit above their original investment from tuition, lost wages, and time.

Diploma recipients—which typically takes a year to complete—had a negative rate of return of 0.7 percent. Over the six years, Diploma recipients received about 99.2 cents for every dollar invested. AA recipients also had a negative rate of return of 4.4 percent, indicating those recipients—who did not also transfer—recovered 96 percent of their original investment.

Certificate recipients, which are very short term program sequences, never earned more than the median wage for leavers. Consequently, the rate of return is not calculable, but is known to be negative.

Prior research has also indicated terminal degrees with a workforce emphasis lead to higher wages. Prior studies estimated that completing a community college technical degree led to a 38 percent increase in wages.<sup>9</sup> In contrast, Iowa's estimates show completing an AAS led to a 55.7 percent increase—above the national estimates.

However, this study excludes AA recipients who transfer—which is a considerable population. Approximately two-thirds of

(Continued on page 8)

*(Continued from page 7)*

AA recipients from Iowa community colleges transfer to a four-year institution. IDE and IWD will follow these transfers when they leave those institutions. National data indicates these students do comparatively well to other bachelor recipients.

### Returns by Program

TEOS permits researchers to link returns to specific career clusters. The results on page 9 show students, on average, see a return on degree. Yet, the returns can depend on the student's major.<sup>10</sup>

An earlier section explored average wages by career cluster—a grouping of majors based on objective career occupations. Page 9 shows the returns to degree by selected career clusters. Some clusters were not “calculable.” Those clusters had negative returns since completers never, on average, earned more than leavers.

The highest returns were in the areas of law, public safety, and corrections (43%); STEM (49.1%); and finance (46%) where returns exceeded 40 percent. Manufacturing (37.8%), health science (32.9%), and architecture & construction (30.8%) had returns exceeding 30 percent. Information technology (26.7%), marketing, sales, and service (12.9%), transportation, distribution, and logistics (12.9%), and agriculture, food, and natural resources (4.6%) had positive returns.

Each major—and by extension, career cluster—are linked to an

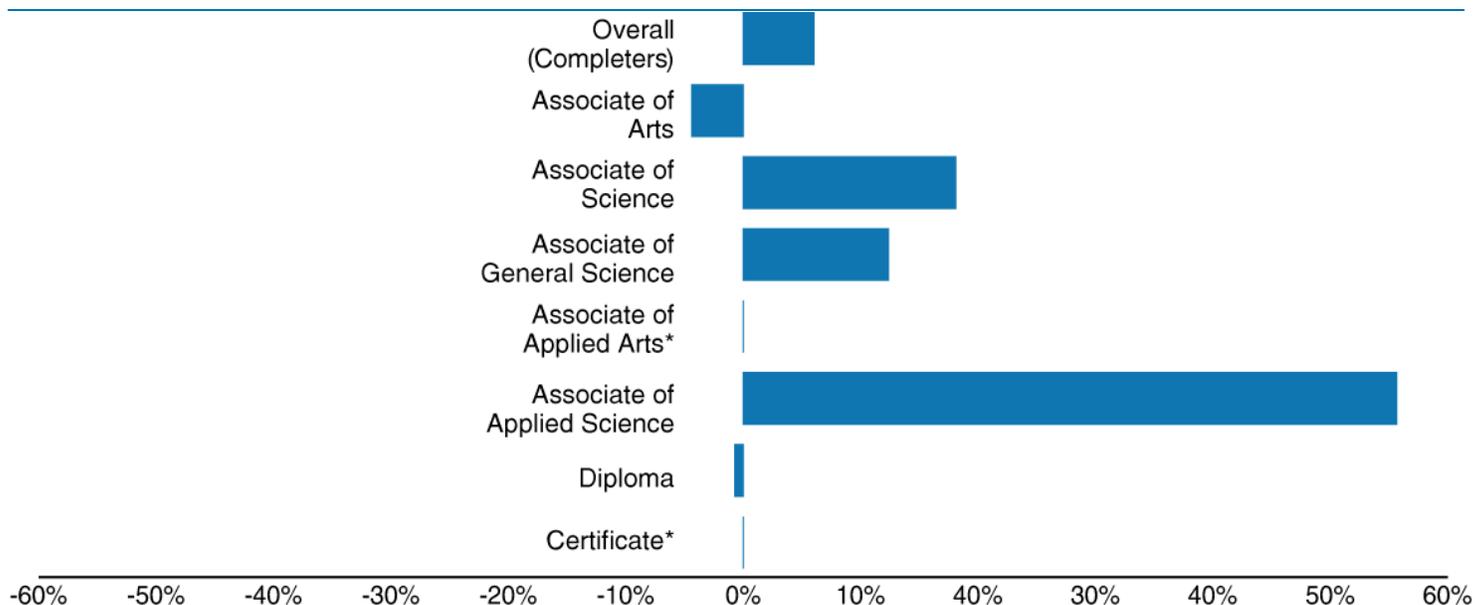
occupation or a set of occupations. The returns to degree by programs primarily depend on the availability of labor in each occupation, the availability of jobs, and general economic conditions.

Government and public administration recipients recouped 82 percent of their investment, but had not yet recouped all expenses. In addition, arts, A/V, technology, technology & communication; business management & administration; education; hospitality & tourism; and human services also had negative returns. Leavers in these clusters consistently had higher median wages than completers, which means it is mathematically impossible to calculate the rate of return.

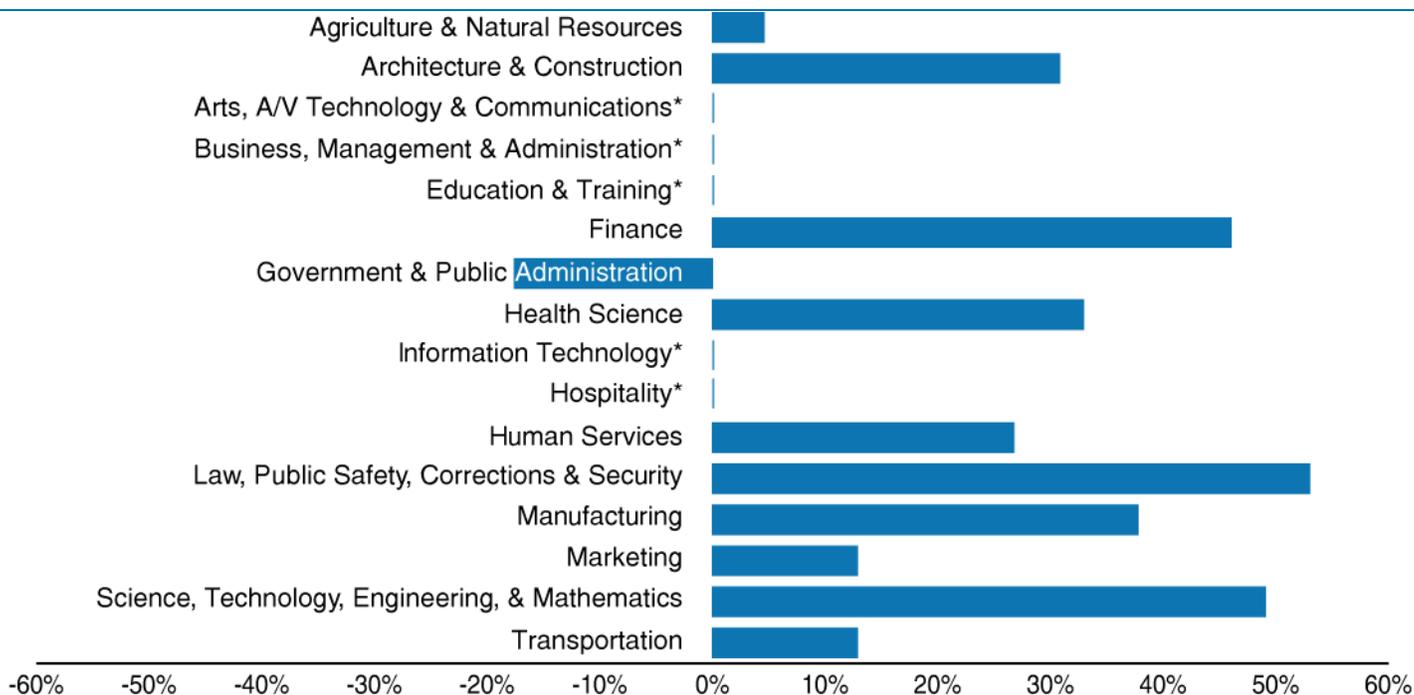
Several reasons—which are not resolved here—may explain the negative returns. First, there could be an excess supply of workers in those fields. Too few jobs for too many graduates can suppress wages. Similarly, there could be too few jobs, which will have the same effect.

The major distinct between completers and leavers, of course, is possessing a community college credential. These clusters may not reward a college degree as much as other aspects of training. For instance, students may gain from obtaining professional licensure and certifications may be prominent in the area. Prior research has shown that occupational licensures increase wage levels.

## RETURNS BY DEGREE TYPE



## RETURNS BY CAREER CLUSTER



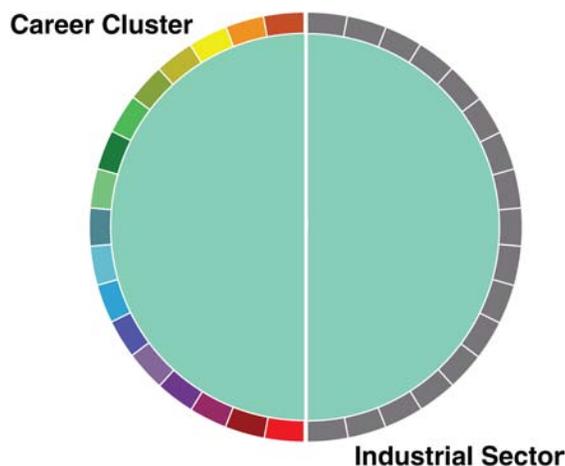
Note: \* denotes completers' wages did not exceed those of leavers, thus, have a negative return to degree that cannot be calculated.

## TRANSITIONS INTO WORKFORCE

TEOS is also able to provide information on the sector of student employment. Which sectors of the economy are provided labor by community college students? Is there any relationship between a student's major and eventual sector of employment?

Page 12 and 13 shows enrollment by the 16 career clusters and college parallel (transfer) programs on the left. Each cluster is represented as a bar, the length of which represents the number of students who transitioned from that career cluster to Iowa's workforce.<sup>11</sup>

The right side of the diagram aggregates various industries to 20 sectors, which describes the function of the business. Again, each sector is represented by a bar, the length of which represents the number of students who were employed there after leaving or completing community college.



Hundreds of ribbons connect the left side to the right side to illustrate the transition from career clusters to the industry of principal employment. The width of each ribbons shows the number of students who majored within each career cluster and transitioned to a particular sector in the economy. Page 11 shows the transition from career clusters to industry by each individual career cluster for clarity.

Over 20,000 students transitioned from an Iowa community college into the workforce in 2006. Most, 9,539 students, transitions from college parallel programs into the workforce.<sup>12</sup> Subsequently, college parallel majors were the largest source of employment in almost every industry.

The previous section of this report shows that college parallel students have a relatively low rate of return. Yet, this section

shows that those students comprise a large share of the labor supply from community colleges.

Health majors almost universally transitioned into jobs within the health industry. Although these occupations may not be aligned with their major, the data provides an indication of success within the program. The health sector received 2,333 students from community colleges as employees. Besides health majors, college parallel students were the second largest source of labor, 1,657 students, coming from Iowa community colleges into the health industry.

Business students, the third largest major, mostly transitioned into the manufacturing industry, followed by retail trades and health care.

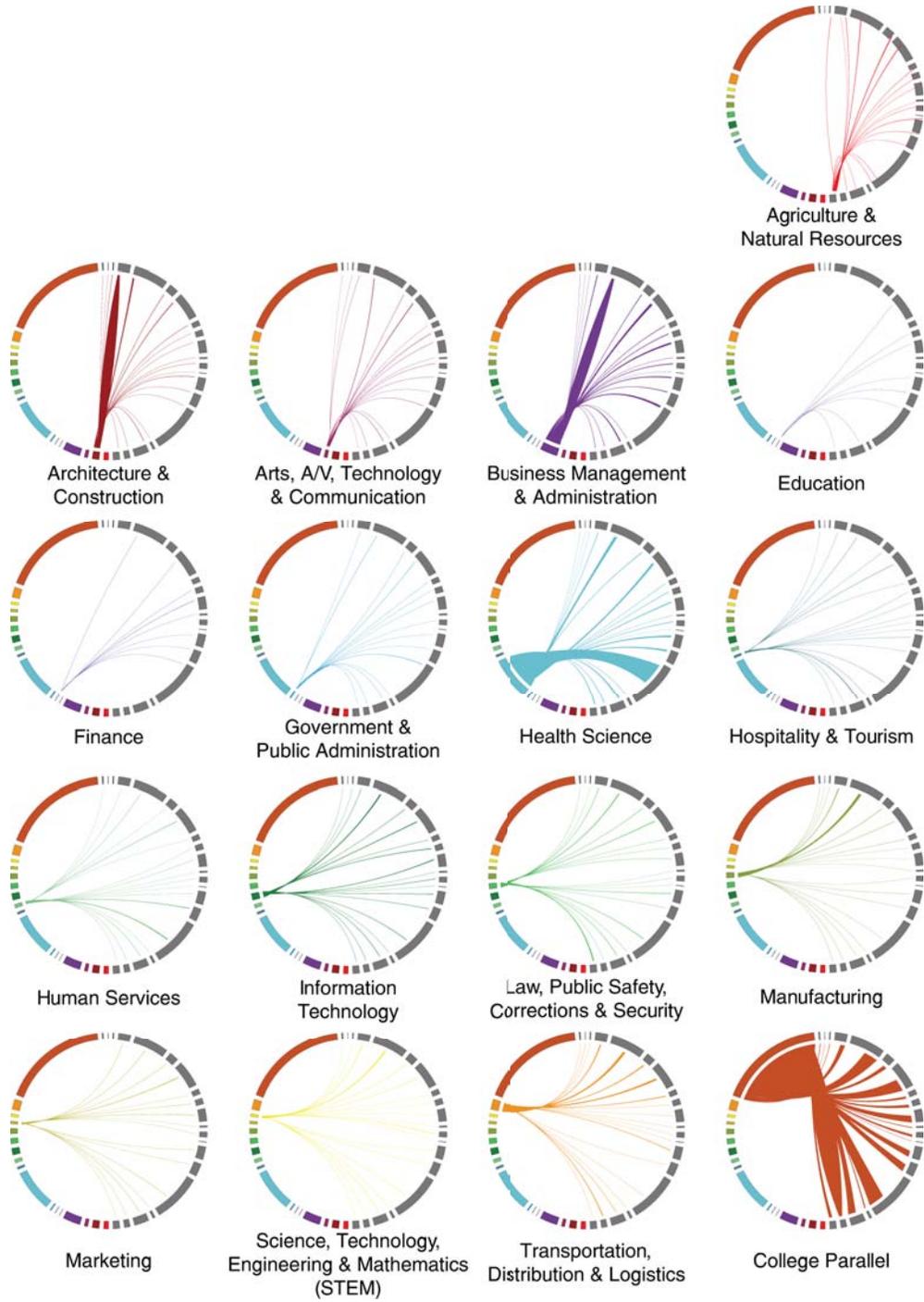
The data also revealed particular, but expected, aspects of each program. For instance, information technology (IT) is utilized in every sector of the economy. Subsequently, IT majors were proportionally represented in each sector.

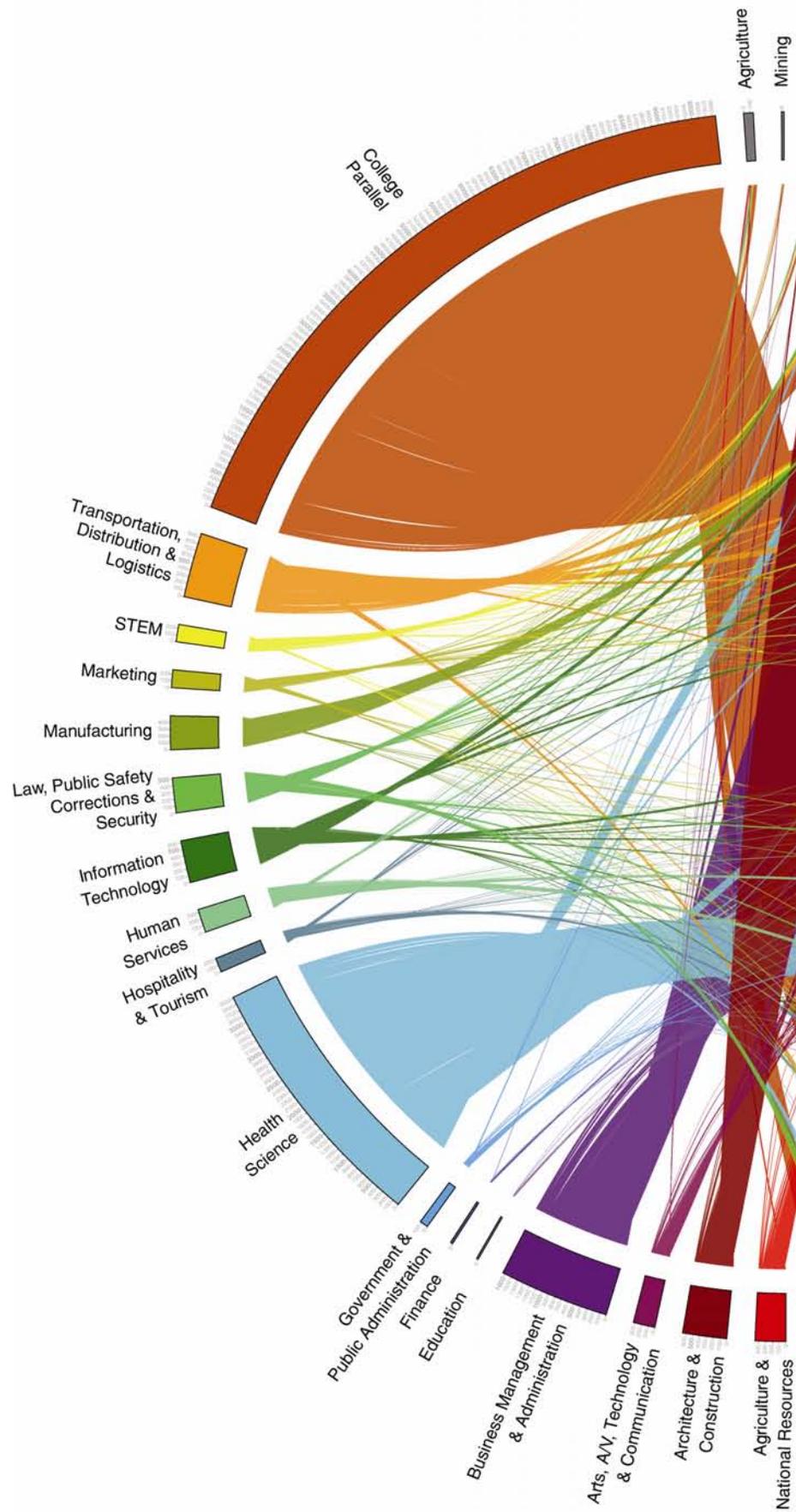
The data also revealed successful transitions from majors to industries. Manufacturing majors end up in the manufacturing industry by a large margin. The manufacturing sector is the largest industry in Iowa and comprises 21 percent of the state's gross domestic product (GDP).<sup>13</sup>

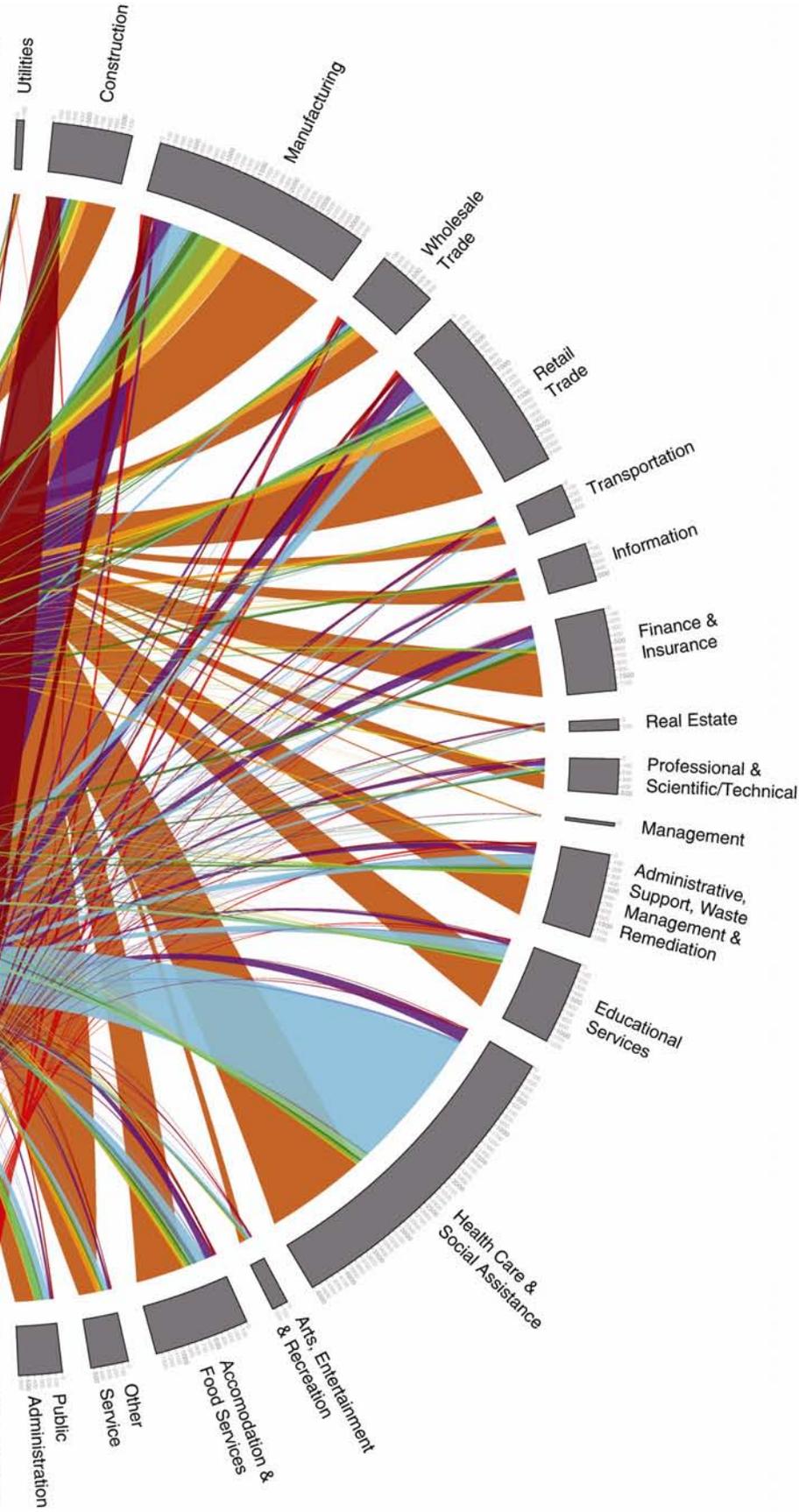
Finally, we can also infer information about labor demand from industries. While manufacturing is the largest sector in Iowa's economy, but is the second largest employer for community college graduates.

Those employers hired a substantial number of college parallel program participants. The health care and administration sector is the largest employer, mostly hiring health science and college parallel majors.

# CAREER CLUSTER TRANSITIONS







## IN-STATE RETENTION

Iowa is widely regarded as a state suffering from “brain drain,” where the educated workforce quickly leaves the state after completing college. Indeed, Census data shows that Iowa is a regular net exporter of college-educated workers.<sup>14</sup> At the same time, Iowa imports a lot of freshmen into Iowa from other states.<sup>15</sup>

In 2006, Iowa imported a net of nearly 5,000 freshmen into the higher education system. However, Iowa has lost 178,000 students with a Bachelor’s degree between 1989 and 2007.<sup>16</sup> Ninety-three percent of new freshmen in Iowa community colleges, however, are Iowa residents.<sup>17</sup>

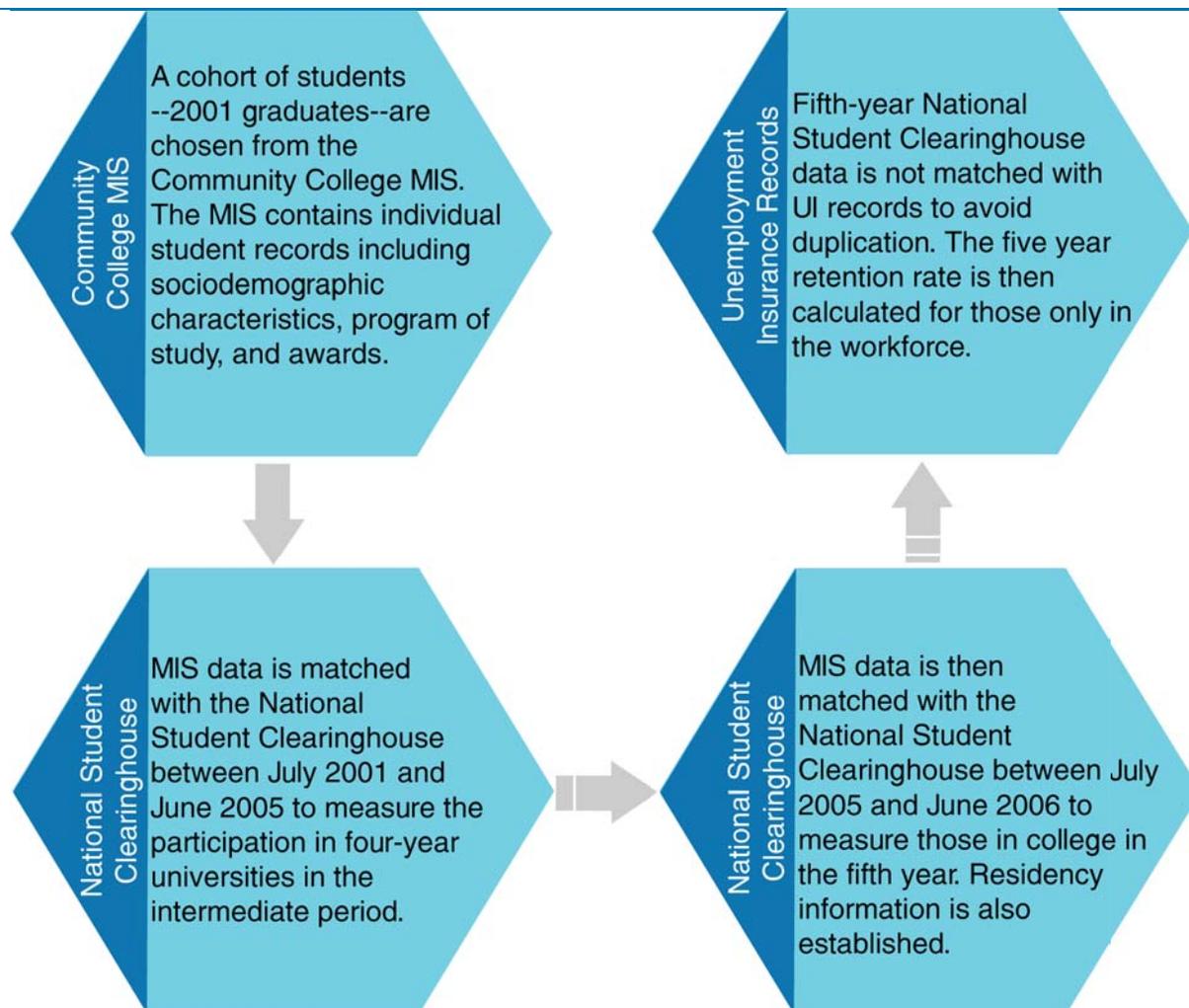
Meanwhile, the Chicago metropolitan area is one of the countries’ largest net importer for college educated workers.

Community colleges regularly survey recent graduates to determine whether they have remained in Iowa or moved out-of-state. The surveys are relatively successful a year after graduation since students are still transitioning into the workforce. However, response rates plummet for the survey five years after graduation since students inevitably move and addresses become out-of-date.

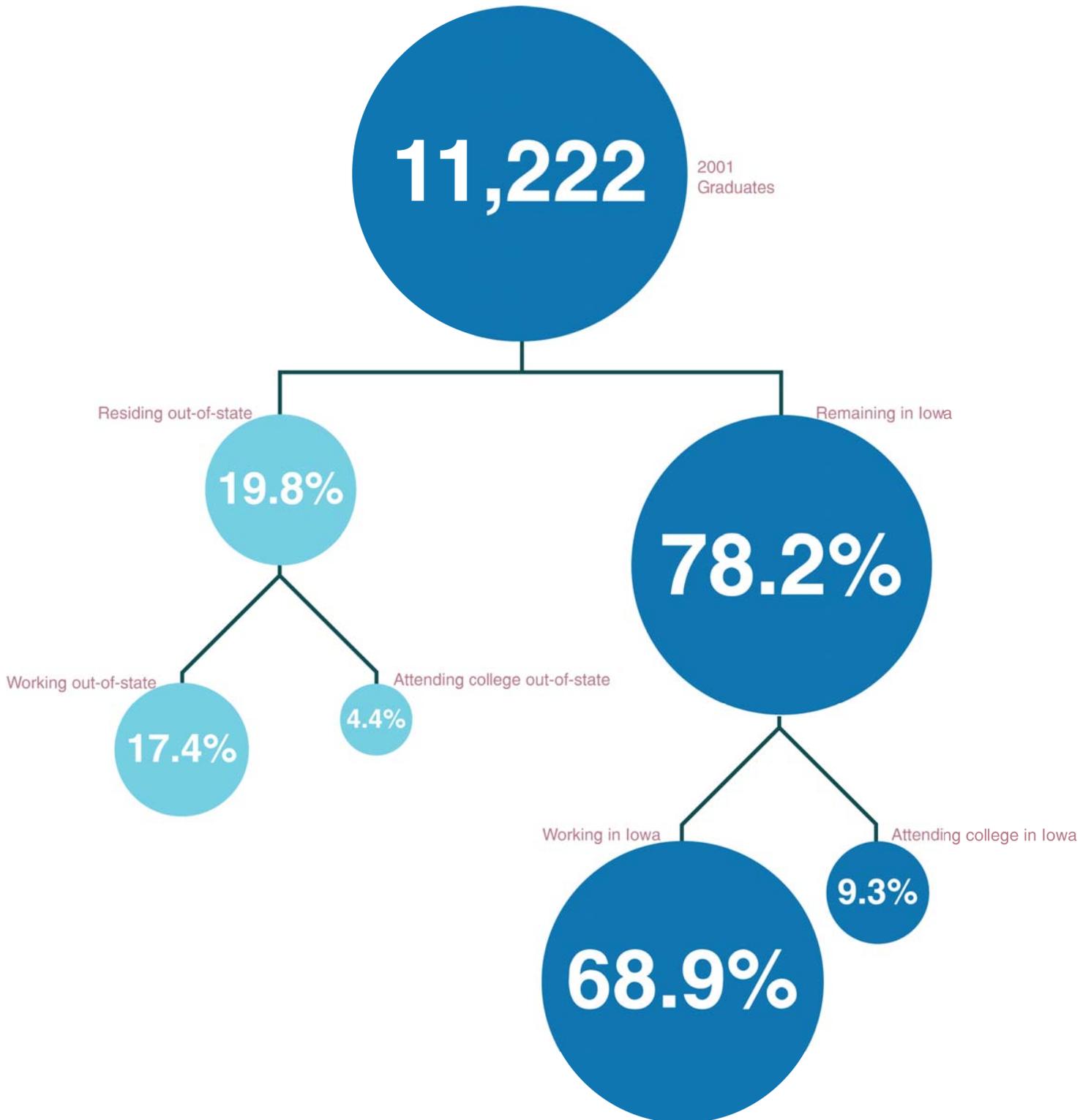
Administrative records provide transfer and workforce data which can be applied to calculate the proportion of students who remain in Iowa after graduation. This section

*(Continued on page 16)*

## IN-STATE RETENTION RATE METHODOLOGY



IN-STATE RETENTION RATE



(Continued from page 14)

details the five-year in-state retention rate for 2001 graduates, including whether students are still enrolled in university or working in the state.

### Methodology

The methodology in this section differs from the prior sections. IDE and IWD tracked students who graduates in 2001 from any Iowa community college. Leavers were excluded from this analysis since they are usually not surveyed by colleges.

The diagram on the bottom of page 12 visually shows the methodology used in this study. The educational data originated from IDE who provided all graduates from fiscal year 2001. Students were matched with National Student Clearinghouse, who provides enrollment information for over 3,000 postsecondary institutions in the United States. Specifically, students who were enrolled in postsecondary institutions five years after graduation—fiscal year 2006—were noted. The clearinghouse provides the state where students are enrolled, which was also noted.

Students who were not found in the clearinghouse were then matched with UI records. Again, students who were found working in Iowa five-years after graduation were noted as working within the state.

The number of students who are either working or attending higher education in Iowa are divided by the number of 2001 graduates gives the in-state retention rate. However, the analysis makes to relatively strong assumptions. First, students who are attending postsecondary institutions and working are only counted as attending school. This likely reflects the student's interest on school rather than working.

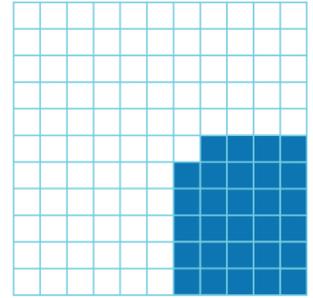
Second, students not found in Iowa nor found attending school out-of-state are assumed to be working out-of-state. This may be incorrect if former student's are simply not in Iowa's workforce (e.g., retired, homemakers), working in an industry not covered by UI records, or deceased.

### Results

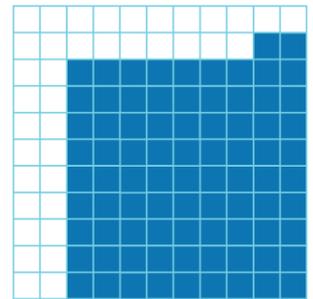
There were 11,222 graduates from Iowa community colleges in 2001. Slightly over 78 percent of those students remained in the state five years after graduation. Most of those students—68.9 percent of the total cohort—were found working in Iowa. Over nine percent of students were attending college in Iowa in 2006.

Conversely, almost 20 percent of students were out-of-state. Most, 17.4 percent of all students, were estimated to be working outside Iowa. A small percentage, 4.4 percent, were attending a postsecondary institution outside of Iowa.

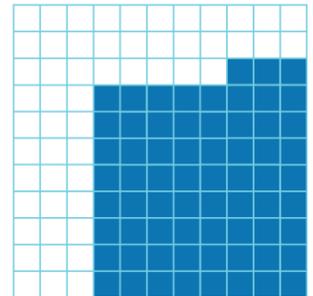
**29%**  
attended an  
Iowa 4-year  
college after  
graduation.



**66%**  
remained in Iowa  
after attending an  
Iowa 4-year  
college.



**52%**  
returned to Iowa  
after attending  
an out-of-state  
4-year college.



By contrast, the Iowa Board of Regents commissioned a study which found 53 percent of graduates were employed in-state a year after graduation.<sup>18</sup> Unfortunately, the analysis did not have a five-year retention rate nor sought those attending other colleges. It is also notable that a significant proportion of students are public universities are out-of-state or international residents.

What path do Iowa community college graduates take to remain in Iowa? Twenty-nine percent of graduates attended an Iowa four-year university after graduation. Sixty-six percent of students who attended an Iowa community college and Iowa four-year university also remained in the state.

Yet, some graduates transfer to an out-of-state four-year college. Fifty-two percent of those students return to Iowa by the fifth year. The so-called “yo-yo” rate, indicates that a majority of students who transfer from and Iowa community college to an out-of-state university are likely to return to the state.

## DISCUSSION & IMPLICATIONS

This study explored several of Iowa's community colleges:

- A community college degree provides an economic return of 6 percent six years after completion.
- Students from transfer-oriented programs constituted half of the labor supply from Iowa's community colleges.
- Colleges provides a plurality of labor to the manufacturing and health sectors. Half of health sciences graduates were later employed in the health and social administration sector.
- Eighty percent of community college graduates from 2001 were in Iowa five years after graduation.

The results highlight the economic benefit of a community college degree and the need to ensure educational attainment for Iowa students. Failing to obtain a credential leaves those individuals disadvantaged in the labor market, on average. Nationally, the gap between educational attainment is attributed to two-thirds of the growth in wage inequality.

In particular, the returns to degree in some career clusters are particularly stark. Law, public safety, and corrections; health sciences; manufacturing; and STEM completers see significantly higher wages in the workforce compared to those who left early. Educational attainment is important in ensuring higher wages.

Yet, generally prescribing a community college degree may not always be appropriate. Some programs do not have positive returns to degree. These programs likely emphasize skills and industry-recognized credentials as much as a community college degree. For instance, mastering basic business applications (e.g., Microsoft Word) may be sufficient to obtain gainful employment.

Colleges seem to successfully supply workers to all sectors of the economy. Most of the students who transitioned into Iowa's workforce from community colleges were employed in the health care & social administration; retail trade; and manufacturing sectors of the economy.

The methods created in this study permit Iowa to be more flexibility to compare results. Returns to degree calculations have been present since the 1960s. Since then, hundreds of studies have investigated the economic value of degrees.<sup>19</sup> The results can also be used to compare Iowa to international results.<sup>20</sup>

Those studies show returns to education are typically 10 percent, but steadily range between 6 and 14 percent to completing a community college degree. This study shows the returns to degree seven years after graduation is six percent. The returns are on the low-side of expectations. However, six years is relatively early in an individual's career. TEOS will be maintained so returns can be calculated ten to fifteen years after graduation when students settle in their careers.

TEOS can also be used to track students from majors to employment. Over 2,000 students transitioned from health science majors into the health care and social assistance industry. Yet, for the first time, the data quantified the number of students who transition from college parallel programs into the workforce without attending a four-year institution. Almost 10,000 students transitioned from college parallel programs into the labor force.

Few studies have linked community college majors to eventual sector of employment. Even though most college parallel students eventually transfer to a four-year institution, almost half of the workforce coming from community colleges were students that did not transfer. Wage data indicates that students who did not transfer after completing a college parallel program earned lower wages and were dispersed throughout the workforce. Even those that completed an AA degree saw lower returns compared to students completing a terminal AAS degree.

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6. Iowa Department of Education, *Ibid*.
7. The methodology for deriving these estimates is not described here. A thorough description of the methodology is available in Tom Schenk Jr. and Kiyokazu Matsuyama, "Calculating Returns to Degree Using Administrative Data: 2002 Cohort." *Iowa Department of Education Technical Bulletin* No. 2 (2009).
8. See Thomas Kane and Cecilia Rouse, "Labor-Market Returns to Two- and Four-Year College." *American Economic Review* 85 No. 3 (1995): 600-614; Duane Leigh and Andrew Gill, "Labor Market Returns to Community Colleges: Evidence for Returning Adults." *Journal of Human Resources* 32 No. 2 (1997): 334-353; and Andrew Gill and Duane Leigh, "Do the Returns to Community Colleges Differ Between Academic and Vocational Programs." *Journal of Human Resources* 38 No. 1 (2003): 134-155.
9. Andrew M. Gill and Duane E. Leigh, "Do the Returns to Community Colleges Differ Between Academic and Vocational Programs?" *Journal of Human Resources* 38 No. 1 (2003): 134-155.
10. See Mark Berger, "Cohort Size Effects on Earnings: Differences by College Major." *Economics of Education Review* 7 No. 4 (1988): 375-383 and Norton Grubb, "The Economic Returns to Baccalaureate Degrees: New Evidence from the Class of 1972." *Review of Higher Education* 15 No. 2 (1992): 213-231.
11. The diagrams were created using *Circos*, an open source program originally used to visualize the relationship of genomes between different species. The methodology is explained in Tom Schenk Jr. and Kiyokazu Matsuyama, "Visualizing Transitions into the Workforce." Paper presented at the annual forum of the Midwest Association for Institutional Research Annual Meeting. (2009) Kansas City, KS. A review of *Circos* in Marin Kryzwinski et al., "Circos: an Information Aesthetic for Comparative Genomics." *Genome Research* (2009): 1639-1645.
12. This data excludes any student who was enrolled in higher education through the National Student Clearinghouse between 2006 and 2008.
14. Britton Lombardi, "Midwest Economy: Supply-side Efforts at Building Skilled Workforce." [http://midwest.chicagofedblogs.org/archives/2008/09/blombards\\_young.html](http://midwest.chicagofedblogs.org/archives/2008/09/blombards_young.html) (accessed September 29, 2008).
15. Keith Greiner and Tony Girardi, *Iowa is a Destination for Out-of-State Students*. Des Moines, IA: Iowa College Student Aid Commission.
16. Tom Mortensen, "Interstate Migration of College Freshmen 1986 to 2007." *Postsecondary Education Opportunity*, No. 194 (2008) and "Interstate Migration of College Graduates 1989 to 2007." *Postsecondary Education Opportunity* No. 194 (2008).
17. Keith Greiner and Tony Girardi, *Ibid*.
18. Iowa Board of Regents, *Report on Employment Upon Graduation*. Urbandale, IA: State of Iowa, Board of Regents.
19. Andrew Gill and Duane Leigh, "Do the Returns to Community Colleges Differ Between Academic and Vocational Programs." *Journal of Human Resources* 38 No. 1 (2003): 134-155; James Heckman, Lance Lochner, and Petra Todd, "Earnings Functions and Rates of Returns." *Journal of Human Capital* 2 No. 1 (2008): 1-31; Thomas Kane and Cecilia Rouse, "Labor-Market Returns to Two- and

Four-Year College.” *American Economic Review* 85 No. 3 (1995): 600-614; Thomas Kane and Cecilia Rouse, “The Community College: Educating Students at the Margin Between College and Work.” *Journal of Economic Perspectives* 13 No. 1: 63-84; and Duane Leigh and Andrew Gill, “Labor Market Returns to Community Colleges: Evidence for Returning Adults.” *Journal of Human Resources* 32 No. 2 (1997): 334-353;

20. George Psacharopoulos, “Returns to Investment in Education: A Global Update.” *World Development* 22 No. 9 (1994): 1325-1345; George Psacharopoulos and Harry Anthony Patrinos, “Returns to Investment in Education: A Further Update. *World Bank Policy Research Working Paper* 2281.

## MEDIAN WAGE BY DEGREE TYPE: 2002 COHORT

Completion / Degree	Median Wages						
	2002	2003	2004	2005	2006	2007	2008
Leavers	\$14,762.93	\$21,621.20	\$24,373.32	\$25,859.47	\$27,469.05	\$28,680.69	\$27,674.79
Completers	12,223.73	20,801.54	24,696.88	27,140.48	29,126.06	30,554.49	29,591.87
AA	13,399.14	19,910.76	22,752.47	24,852.72	27,054.91	29,420.72	28,712.73
AS	12,938.61	22,469.24	26,593.80	28,325.04	30,320.24	31,725.65	29,922.71
AGS	14,089.16	24,197.09	31,553.75	34,151.34	34,214.02	33,105.44	33,681.25
AAA	10,752.22	18,264.41	20,586.75	24,573.26	22,671.36	25,995.08	25,650.14
AAS	12,432.91	28,392.90	32,961.85	35,324.68	36,965.78	38,030.62	37,120.56
Diploma	9,004.27	19,969.01	26,246.94	27,306.67	28,734.45	29,873.41	29,110.69
Certificate	12,638.55	18,812.02	20,807.91	20,570.19	22,284.21	22,690.79	23,651.30

Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education and Iowa Workforce Development.

## MEDIAN WAGE BY CAREER CLUSTER: 2002 COHORT

Career Cluster	Completion / Degree	Median Wages						
		2002	2003	2004	2005	2006	2007	2008
Agriculture	Leavers	\$11,970.33	\$19,148.97	\$25,326.63	\$25,904.04	\$28,131.21	\$29,939.14	\$29,412.88
	Completers	11,138.84	21,844.14	25,320.58	27,384.68	29,498.46	32,142.47	30,093.64
Construction	Leavers	13,084.88	22,688.12	27,266.03	29,293.95	32,774.78	33,458.40	31,067.78
	Completers	10,257.54	23,445.82	28,608.37	31,868.98	34,304.02	36,632.63	35,438.79
Arts/Comm	Leavers	8,791.30	14,407.21	16,999.86	18,201.74	19,603.51	21,129.71	21,592.32
	Completers	11,816.80	17,963.81	21,991.72	25,589.67	25,685.12	26,304.70	25,564.13
Business	Leavers	14,072.10	19,772.33	22,038.22	22,852.33	24,564.53	25,223.18	24,265.94
	Completers	12,071.21	19,444.85	21,954.85	23,455.63	23,984.46	24,952.59	24,588.73
Education	Leavers	15,097.29	21,671.98	24,212.19	25,760.62	27,622.02	28,747.36	27,777.43
	Completers	13,062.15	16,648.49	19,145.58	22,875.78	25,632.36	27,633.56	26,753.34
Finance	Leavers	23,045.22	31,504.13	32,102.41	32,440.00	32,941.53	33,225.91	32,816.85
	Completers	23,683.26	29,403.89	35,493.77	30,764.19	32,921.17	32,491.83	36,963.35
Government	Leavers	41,392.79	40,247.55	47,414.12	46,825.37	50,145.84	39,362.20	42,188.25
	Completers	4,104.07	20,686.36	23,940.38	25,026.30	30,304.92	19,964.89	35,309.57
Health	Leavers	15,089.99	21,756.52	23,489.34	24,671.02	25,256.12	25,926.48	25,042.74
	Completers	11,805.42	25,871.93	31,362.92	31,827.43	33,786.01	33,346.19	32,368.56
Hospitality	Leavers	11,212.81	16,266.47	18,066.74	20,234.25	22,255.70	22,002.82	21,435.01
	Completers	15,348.51	18,034.29	22,921.99	22,488.60	22,530.24	25,571.53	23,789.32
Human Services	Leavers	12,782.84	16,355.40	17,766.58	18,562.05	19,096.69	20,392.00	19,472.34
	Completers	9,404.03	14,061.14	15,125.26	18,211.23	18,738.75	20,058.85	18,784.46
IT	Leavers	17,933.46	27,182.73	29,737.05	31,506.56	33,104.76	34,536.14	30,677.06
	Completers	13,244.49	22,347.63	28,091.40	30,984.40	33,203.15	35,123.86	33,124.18
Law	Leavers	14,984.93	21,193.16	24,683.30	27,056.30	29,516.42	31,500.95	31,097.14
	Completers	15,238.98	24,309.03	29,982.08	32,799.54	36,963.07	38,463.23	37,233.73
Manufacturing	Leavers	13,594.97	25,225.51	29,973.43	33,584.65	35,539.33	36,096.65	36,013.22
	Completers	12,228.98	24,792.73	32,267.68	35,128.81	37,301.96	38,092.00	37,286.93
Marketing	Leavers	14,654.37	21,049.99	24,375.99	26,895.59	28,535.68	28,588.23	27,971.97
	Completers	17,985.65	23,818.71	26,248.55	29,475.08	29,874.48	30,226.71	27,549.00
STEM	Leavers	14,971.15	29,148.92	34,029.11	37,064.33	39,009.25	39,870.61	38,318.38
	Completers	11,258.47	27,577.71	33,422.32	37,491.21	39,039.81	40,781.55	38,801.78
Transportation	Leavers	11,736.23	20,417.96	25,681.09	26,987.09	28,949.04	31,336.00	31,117.24
	Completers	12,074.27	21,547.93	25,422.20	28,827.26	31,367.96	32,739.77	32,986.50

Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education and Iowa Workforce Development.

## MEDIAN WAGE BY CAREER CLUSTER: 2006 COHORT

Career Cluster	Completion / Degree	Median Wages		
		2006	2007	2008
Agriculture	Leavers	\$18,699.11	\$22,747.64	\$23,411.67
	Completers	9,606.46	21,610.69	23,609.66
Construction	Leavers	20,135.35	23,100.27	25,983.34
	Completers	8,290.03	25,951.21	29,299.85
Arts/Comm	Leavers	15,089.27	18,337.05	21,091.53
	Completers	9,591.18	19,287.71	23,331.81
Business	Leavers	18,918.33	21,036.69	21,865.63
	Completers	11,357.31	21,225.00	22,400.46
Education	Leavers	14,070.90	17,536.31	17,515.67
	Completers	12,017.84	19,111.98	16,233.24
Finance	Leavers	25,525.80	25,755.71	25,250.88
	Completers	24,346.51	24,199.51	26,100.94
Government	Leavers	12,852.06	17,316.59	15,772.04
	Completers	17,659.13	21,488.54	24,088.77
Health	Leavers	19,868.00	21,958.66	23,098.53
	Completers	10,763.10	27,894.97	30,741.02
Hospitality	Leavers	12,922.00	15,142.71	16,636.27
	Completers	11,193.39	20,117.37	23,796.24
Human Services	Leavers	14,504.15	16,096.42	16,772.68
	Completers	10,755.82	16,755.09	18,537.12
IT	Leavers	23,906.59	26,991.77	28,074.96
	Completers	12,057.35	29,264.50	31,588.16
Law	Leavers	20,061.26	23,574.35	24,779.64
	Completers	13,026.51	22,870.08	28,319.12
Manufacturing	Leavers	28,033.51	30,661.85	33,025.28
	Completers	15,457.94	32,404.38	35,885.68
Marketing	Leavers	20,492.94	23,698.15	25,259.32
	Completers	16,001.82	23,385.36	26,312.52
STEM	Leavers	22,570.36	29,130.92	29,593.39
	Completers	11,959.57	38,036.10	39,590.88
Transportation	Leavers	19,751.95	22,754.18	25,134.80
	Completers	13,571.84	26,130.84	28,972.24
College Parallel	Leavers	18,007.63	21,426.98	23,299.04
	Completers	13,175.81	20,125.75	22,354.58

Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education and Iowa Workforce Development .

## RATE OF RETURN & NET PRESENT VALUE: 2002 COHORT

Completion / Degree	Net Present Value	Internal Rate of Return
AA	-9,286	-4.4%
AS	9,343	18.1%
AGS	24,966	12.4%
AAA	-26,986	NA
AAS	41,962	55.7%
Diploma	-3,169	-0.7%
Certificate	-33,249	
<b>Completers</b>	<b>\$1,994</b>	<b>6.0%</b>

Note: Each "|" in the second column denotes \$1,000 students. In the last column, each "%" denotes one percent. Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education and Iowa Workforce Development.

## RATE OF RETURN & NPV BY CAREER CLUSTER: 2002 COHORT

Career Cluster	Net Present Value	Internal Rate of Return
Agriculture, Food, and Natural Resources	-\$913	4.6%
Architecture & Construction	\$24,563	30.8%
Arts, AV, & Communication	-\$20,702	NA
Business, Management, and Administration	-\$23,407	NA
Education and Training	-\$22,168	NA
Finance	\$35,450	46.0%
Government and Public Administration	-\$13,315	-17.6%
Health Sciences	\$21,860	32.9%
Hospitality and Tourism	-\$33,237	NA
Human Services	-\$50,902	NA
Information Technology	\$22,391	26.7%
Law, Public Safety, and Security	\$29,763	53.0%
Manufacturing	\$35,364	37.8%
Marketing, Sales, and Service	\$4,883	12.9%
STEM	\$53,578	49.1%
Transportation, Distribution and Logistics	\$5,947	12.9%

Note: Each "|" in the second column denotes \$1,000 students. In the last column, each "%" denotes one percent. Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education and Iowa Workforce Development.

TRANSITIONS FROM CAREER CLUSTER TO INDUSTRY SECTOR: 20026COHORT

Industrial Sector	Agriculture, Food, and Natural Resources	Architecture & Construction	Arts, AV, & Communication	Business, Management, and Administration	Education and Training	Finance	Government and Public Administration	Health Sciences	Hospitality and Tourism	Human Services	Information Technology	Law, Public Safety, and Security	Manufacturing	Marketing, Sales, and Service	STEM	Transportation, Distribution and Logistics	College Parallel	Total
Agriculture	26	9	1	9	0	0	0	9	1	1	3	5	7	0	2	11	59	143
Mining	0	3	0	5	0	0	0	1	0	0	0	0	2	0	0	12	14	37
Utilities	3	29	2	8	0	0	0	9	0	0	3	1	5	0	4	3	43	110
Construction	33	219	13	76	0	0	3	49	5	4	22	31	69	14	31	107	481	1,157
Manufacturing	65	150	61	248	0	5	19	301	18	22	122	77	292	24	105	260	1,454	3,223
Wholesale Trade	84	33	19	60	0	0	8	57	8	1	27	28	27	17	13	105	394	881
Retail Trade	65	58	65	246	3	1	20	222	27	44	73	57	23	59	20	190	1,285	2,458
Transportation & Warehousing	19	20	4	53	0	0	4	32	4	1	20	15	17	7	4	78	217	495
Information	10	4	31	64	1	2	2	43	5	2	60	8	2	20	4	10	291	559
Finance & Insurance	6	6	16	175	1	18	3	96	5	14	71	23	1	33	1	5	714	1,188
Real Estate	1	6	6	22	0	1	0	22	1	3	8	1	3	3	2	4	75	158
Professional, Scientific, & Technical Services	13	14	17	80	0	0	1	58	1	4	37	5	5	6	25	2	242	510
Management	0	2	0	6	0	0	0	4	2	1	4	1	0	0	1	1	24	46
Administrative & Support	40	29	17	111	1	1	6	172	19	14	41	46	14	17	10	50	631	1219
Educational Services	23	12	8	65	12	2	5	167	5	78	30	15	7	9	5	3	761	1207
Health Care & Social Assistance	12	8	20	202	3	4	36	2333	21	117	37	44	3	18	6	5	1657	4526
Arts, Entertainment, & Recreation	15	1	4	18	0	0	1	35	11	2	5	8	1	6	3	2	122	234
Accommodation & Food Services	14	31	27	119	4	0	7	146	76	24	35	35	6	20	12	30	793	1379
Other Services	9	10	12	34	0	0	4	62	2	12	17	5	7	7	4	79	282	546
Public Administration	16	11	1	36	1	0	4	97	2	4	13	113	8	4	6	5	311	632
<b>Total</b>	<b>454</b>	<b>655</b>	<b>324</b>	<b>1,637</b>	<b>26</b>	<b>34</b>	<b>123</b>	<b>3,915</b>	<b>213</b>	<b>348</b>	<b>628</b>	<b>518</b>	<b>499</b>	<b>264</b>	<b>258</b>	<b>962</b>	<b>9,850</b>	<b>20,708</b>

Source: Iowa Department of Education, Bureau of Community Colleges, Community College MIS and Iowa Workforce Development, Regional Research and Analysis Bureau. Iowa Department of Education & Iowa Workforce Development (2010).

