# THE CONDITION OF
## CAREER & TECHNICAL EDUCATION

*Secondary Courses, Programs, Students, and Faculty*

ISSUED
MAY
**2018**

*Students tour the Waterloo Career Center*


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## Letter from the Director

Dear Education Stakeholders,

One of the critical functions of the Iowa Department of Education is to provide and interpret educational data. We do this to support accountability, transparency, and the ongoing improvement of our schools. Staff in the Division of Community Colleges and Workforce Preparation continue to refine and improve the methods in which we collect, analyze, and report data to ensure that it is both meaningful and easily understood.

Through the Future Ready Iowa initiative, Governor Reynolds has called for 70 percent of Iowans in the workforce to have postsecondary education or training by 2025. As expressed in Iowa's unified state plan for implementation of the Workforce Innovation and Opportunity Act (WIOA), the secondary Career and Technical Education (CTE) redesign effort is an essential strategy for addressing this moral and economic imperative by supporting students in exploring and pursuing rewarding careers, closing skills gaps faced by employers, and enhancing the vitality of communities. The Department's goals, as reflected in the State Board of Education's priorities, are to ensure all high school students have consistent and equitable access to high-quality CTE programs and facilitate efficient delivery of curricula aligned with regional economic demand.

This first-of-its-kind report provides baseline information on the trends in secondary CTE courses and programs, enrollment, student characteristics, and instructors, using Iowa Department of Education data from Academic Years (AY) 2013-2017. Additionally, the report briefly describes the three emerging areas of focus for implementing high-quality CTE through House File (HF) 2392, the 2016 legislation that redesigned secondary CTE. As the implementation of HF 2392 begins to take a foothold across secondary CTE, the information provided in this report, as well as those that follow, should enable the 15 CTE regional planning partnerships (RPPs) to set in place high-quality CTE all across Iowa.

Thank you for taking the time to review this report and for your ongoing support of secondary CTE in Iowa. I look forward to working with you to provide Iowans with quality programs, services, and opportunities to meet their career and educational goals.

Sincerely,

Ryan M. Wise

Ryan M. Wise, Ed.L.D.
Director
Iowa Department of Education

## Executive Summary

Secondary career and technical education (CTE) in Iowa is funded and measured by both state and federal appropriations, policy, and procedures. Since its inception in 1984, the federal Carl D. Perkins Act has been the main driver of secondary and postsecondary CTE programs across the nation, providing a framework for programs of study, budgeting and finance, and accountability. The federal Carl D. Perkins Act is now in its fourth iteration and is called the Carl D. Perkins Career and Technical Education Act of 2006 (often referred to as Perkins IV).

In a sweeping effort to redesign secondary CTE in Iowa, HF 2392 was signed into law on May 26, 2016. This legislation builds upon recommendations released by the Secondary Career and Technical Education (CTE) Task Force, marks the first major revision to secondary CTE policy in Iowa since 1989, and shifts from a reliance on federal policy to a more focused state effort to capitalize on secondary CTE programs for workforce development. HF 2392 has its roots in the five broad directional recommendations of the statewide secondary CTE Task Force – career guidance; high-quality CTE programming; work-based learning; teacher preparation and professional development; and, regional partnerships/regional centers.

While both addressing secondary career and technical education, Perkins IV and HF2392 are implemented separately in Iowa. However, given the early iterations of the Carl D. Perkins federal legislation reauthorization, Iowa is well positioned to align the work of both state and federal efforts to a singular, cohesive model for secondary CTE. The data and information presented in this report set the stage for exploring the possibility of aligning state and federal policy implementation of high-quality secondary CTE.

The report is divided into two main sections: Section I presents five-year longitudinal data (2012-13 to 2016-17) on participation in secondary CTE courses and programs; secondary CTE enrollment patterns; CTE student characteristics; and secondary CTE human resources. Section II briefly describes three aspects of CTE programming – career and technical student organizations (CTSOs); career guidance; and regional centers, which are coming to the forefront as HF 2392 moves to full implementation across public school districts in Iowa.

## Report Highlights

From the tables and figures presented in this report the following can be said for secondary CTE during academic years (AY) 2013 through AY2017:

### Secondary CTE Courses and CTE Programs

- The total number of CTE courses and programs offered and taught was generally steady, with only minor shifts up and down, over the five-year period.
- Significant growth in the use of college-credit contracted courses in secondary CTE programs occurred over the five-year period (Figure 2.1).
- Growth in secondary CTE programs across the 16 career clusters was varied, with the following clusters showing an increase over the five year period: Agriculture, Food and Natural Resources; Architecture and Construction; Health Sciences; Hospitality and Tourism; and Manufacturing. The other career clusters either showed a decline, or remained steady, over the five-year period (Table 2.4).

### Secondary CTE Enrollment

- While overall enrollment in secondary CTE (Figure 3.1) and secondary CTE participation rates (Figure 3.2) remained steady, there was significant growth in student participation in college-credit contracted CTE courses during the past five years (Figure 3.1).
- Students in smaller school districts were participating at relatively higher rates in secondary CTE, while college-credit contracted CTE participation rates were much lower. The reverse is true for relatively larger school districts (Figure 3.4).

### Characteristics of Secondary CTE Students

- White students show a slight decline in secondary CTE participation over the five-year time period, while a slight corresponding rise exists for minority students (Figure 4.1).
- Hispanic and African American students make up about 75 percent of overall minority secondary student CTE participation (Table 4.1); CTE participation for different student population groups has remained more or less steady over the five-year time period.
- Secondary student participation rates in CTE is higher for male students than female students. (Figure 4.2)
- The proportion of secondary CTE students eligible for free or reduced price school meals remained steady over the five year period (Figure 4.3). It is noteworthy that the proportion of secondary CTE students eligible for free or reduced price school meals was not much different than the proportion of those not eligible when it comes to average CTE course taking (Figure 4.9).

Secondary CTE Human Resources

- Secondary CTE teacher characteristics have not changed over the five-year time period. The secondary CTE teacher is predominantly white and close to 50 years old (Table 5.1 and 5.2) .
- The service areas in which secondary CTE teachers have received the most CTE endorsements are more aligned to those service areas that were in place prior to the reconfiguration as a result of HF 2392. As HF 2392 reaches full implementation, there should be realignment as secondary CTE teachers focus more on the newer service areas or get endorsements in multiple areas (Figure 5.3).
- Community college CTE faculty teaching high school students generally tend to be female, white, working as part-time or adjunct faculty, are close to 50 years old, and earn, on average, slightly below $27,500 (adjusting for inflation).

Career and Technical Student Organizations (CTSO)

- CTSO participation in Iowa has been more or less steady (between 20,000 and 30,000 annual members).
- CTSOs are closely aligned to the six service areas in which Iowa high school students enroll in CTE courses.
- The CTSO in Iowa with the highest secondary membership is FFA, however several other CTSOs also have substantial secondary membership.

Secondary Career and Academic Planning

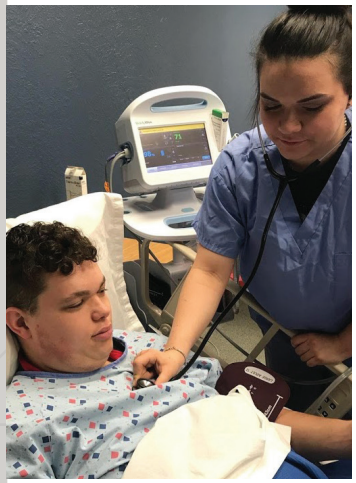
- Public school districts in Iowa are required to choose a career information system (CIS). The overarching goal of the re-visioning of career and academic planning in Iowa (HF 2392, Division I) is to create within every school district an 8th grade individual career and academic plan (ICAP) and to monitor the progress of these ICAPs as the students move through grades 9 through 12. Of the eligible student population in grades 8 through 12, 53 percent met the requirements under HF 2392, Division I (Figure 7.3).
- District teams are required to build relationships with the external stakeholders to (a) identify community and regional labor market needs; and (b) provide CTE programming that fits the needs of students and the community. Employers and higher education partners are involved within the greatest of number of school districts (Figure 7.2).

Regional Centers

- Regional centers are clustered around the major metropolitan areas in Iowa, which typically have the larger school districts and the higher high school populations to make the regional center viable. Nevertheless, regional centers are also established where school district sizes are small and located in the rural parts of Iowa. However, there are many regions of Iowa where regional centers have not yet been established.
- With the implementation of HF 2392 beginning to take a foothold across Iowa, the expectation is that the regional planning partnerships (RPPs), through their strategic planning, will begin to explore the viability of regional centers in offering expanded options for students and ensuring equitable access to a variety of high-quality CTE programs which also meet the needs of the regional workforce.

*The Cafe, at Des Moines' Central Campus.*

*Welding simulator at Jones County Regional Center.*



*CNA lab at the Sioux City Career Academy.*

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# Section I:

## *Introduction to Iowa Secondary Career and Technical Education*

*Students prepare for a segment for Boone TV, the student-run television station at Boone High School.*

*Waukee High School students prepare for competition at the 2018 ProStart Invitational where top high school teams have one hour to create a three-course meal.*

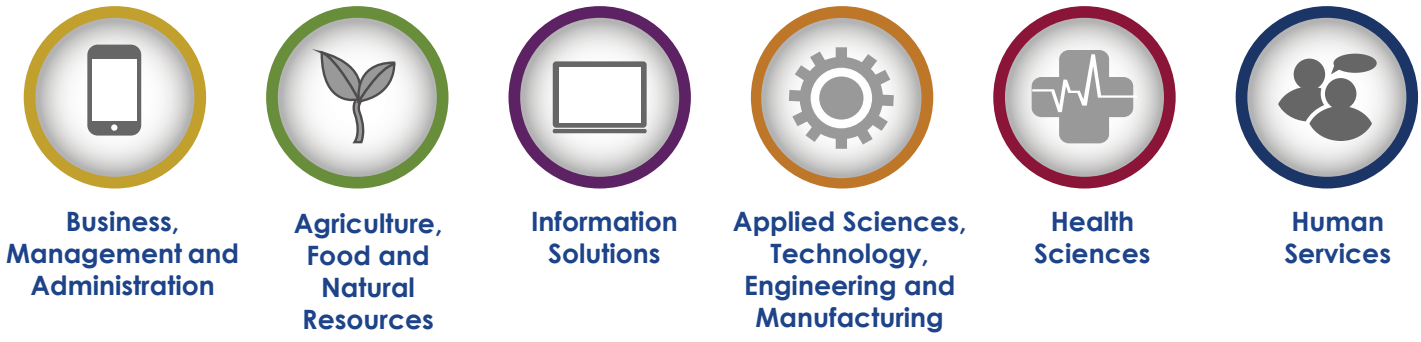
## Chapter 1: Overview

Career and technical education (CTE) in Iowa includes organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in employment in current or emerging occupations. These programs include competency-based, applied learning which contributes to an individual's academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, and occupational-specific skills.

At the secondary level, CTE programs are organized within six broad service areas: 1) agriculture, food, and natural resources; 2) arts, communications, and information systems; 3) applied sciences, technology, engineering, and manufacturing, including transportation, distribution, logistics, architecture, and construction; 4) health sciences; 5) human services; and 6) business, finance, marketing, and management. Programs within these service areas are further aligned with the National Career Clusters™ Framework. CTE programs at the postsecondary (community college) level are also organized by the Career Clusters™ framework. This report focuses on secondary CTE courses, programs, students, and faculty, drawing on five years of data (Academic Year (AY) 2013-2017).

Secondary CTE in Iowa is funded and measured by both state and federal appropriations, policy, and procedures. In a sweeping effort to redesign secondary CTE in Iowa, HF 2392 was signed into law on May 26, 2016. This legislation builds upon recommendations released by the Secondary CTE Task Force, marks the first major revision to secondary CTE policy in Iowa since 1989, and shifts a reliance on federal policy to a more focused state effort to capitalize on secondary CTE programs for workforce development. Since its inception in 1984, the federal Carl D. Perkins Act has been the main driver of secondary and postsecondary CTE programs across the nation, providing a framework for programs of study, budgeting and finance, and accountability. The federal Carl D. Perkins Act is now in its fourth iteration and is called the Carl D. Perkins Career and Technical Education Act of 2006 (often referred to as Perkins IV).

**FIGURE 1.1: SIX SECONDARY CTE SERVICE AREAS**



Under Perkins IV, Iowa receives over $11 million annually in federal funds, an amount that has not changed since 2006. As the designated state eligible agency (SEA), the Iowa Department of Education (Department) is responsible for distributing these funds to 90 local eligible agencies (LEAs), including the 15 community colleges; 45 Perkins consortia, each made up of multiple school districts; and 30 individual school districts. Of the total funds received by Iowa under Perkins IV, 85 percent is distributed to LEAs and 15 percent is used for state CTE leadership and administration. Iowa's state plan outlines how these funds are to be allocated, distributed, and expended as a requirement under Perkins IV. The state plan was approved by the State Board of Education when it was initially written in 2007, and has been periodically reviewed and updated.

Secondary CTE programs are measured by six accountability indicators (prescribed in the law itself) for meeting Perkins IV requirements:

- 1S1: Academic Attainment in Reading/ Language Arts
- 1S2: Academic Attainment in Mathematics
- 2S1: Technical Skills Attainment
- 3S1: Secondary School Completion
- 4S1: Student Graduation Rate
- 5S1: Secondary Placement
- 6S1: Nontraditional Participation
- 6S2: Nontraditional Completion

Iowa negotiates an annual performance target with the U.S. Department of Education for each of these indicators to measure state and local performance. Table 1.1 shows Iowa's performance relative to the annual targets since AY2013. During the past two years, Iowa secondary CTE has met or exceeded nearly all of the targets.

TABLE 1.1 STATE-LEVEL SECONDARY PERKINS ACCOUNTABILITY INDICATORS: TARGET AND PERFORMANCE

| | 1S1 | | 1S2 | | 2S1 | | 3S1 | |
|---|---|---|---|---|---|---|---|---|
| **Academic** | **Target** | **Actual** | **Target** | **Actual** | **Target** | **Actual** | **Target** | **Actual** |
| 2013 | 82.78% | 79.28% | 84.44% | 78.40% | 78.89% | 91.43% | 95.00% | 92.36% |
| 2014 | 76.84% | 80.63% | 77.35% | 80.15% | 90.00% | 92.44% | 95.00% | 92.91% |
| 2015 | 79.00% | 79.38% | 78.00% | 84.64% | 91.00% | 92.47% | 93.00% | 93.29% |
| 2016 | 80.00% | 85.16% | 80.00% | 84.37% | 92.00% | 93.00% | 93.00% | 97.00% |
| 2017 | 80.00% | 85.22% | 80.00% | 84.35% | 92.00% | 93.00% | 93.00% | 99.00% |
| | **4S1** | | **5S1** | | **6S1** | | **6S2** | |
| **Academic** | **Target** | **Actual** | **Target** | **Actual** | **Target** | **Actual** | **Target** | **Actual** |
| 2013 | 93.89% | 92.74% | 92.22% | 87.54% | 31.16% | 40.88% | 33.37% | 33.85% |
| 2014 | 93.89% | 92.29% | 87.78% | 88.30% | 45.00% | 40.01% | 36.00% | 33.38% |
| 2015 | 93.00% | 92.67% | 88.00% | 87.90% | 45.00% | 38.01% | 36.00% | 29.47% |
| 2016 | 93.00% | 97.00% | 88.00% | 93.00% | 40.00% | 38.00% | 34.00% | 34.00% |
| 2017 | 93.00% | 98.00% | 88.00% | 94.00% | 38.00% | 41.00% | 30.00% | 32.00% |

Signed into law in 2016, HF 2392 set forth a forward-looking policy framework for secondary CTE, building off of exceptional practices implemented around the state and replacing an archaic vocational education law adopted in 1989.

With technological change and globalization changing the economy within the state and nationally, education and training beyond high school has become the new minimum threshold for economic security. Through the Future Ready Iowa initiative, Governor Reynolds has called for 70 percent of Iowans in the workforce to have postsecondary education or training by 2025. As expressed in Iowa's unified state plan for implementation of the Workforce Innovation and Opportunity Act (WIOA), the secondary CTE redesign effort is an essential strategy for addressing this moral and economic imperative by supporting students in exploring and pursuing rewarding careers, closing skills gaps faced by employers hampering growth, and enhancing the vitality of communities. The Department's goals, as reflected in the State Board of Education's priorities, are to ensure all students have consistent and equitable access to high-quality CTE programs and facilitate efficient delivery of curricula aligned with regional economic demand.

HF 2392 had its roots in the five broad directional recommendations of statewide secondary CTE Task Force – career guidance; high-quality CTE programming; work-based learning; teacher preparation and professional development; and, regional partnerships/regional centers. The three main themes of the law include:

1. Career Guidance: Shifting to a more holistic approach with school teams developing district plans to enhance how students explore career and academic opportunities and develop individualized plans.
2. High-Quality Programs: Raising expectations for CTE programs, employer engagement, and alignment with high demand areas. Setting a vision for curricula that starts with foundational work and leads to occupationally-specific college-credit opportunities, integrates work-based learning, and aligns with a modernized career cluster framework.
3. Regional Planning: Establishing regional CTE planning partnerships of schools, community colleges, and business and community partners to ensure efficient and effective delivery of high-quality programs that expand student opportunity and align with regional labor market needs.

The data and information presented in this report sets the stage for exploring the possibility of aligning state and federal policy implementation of high-quality secondary CTE.

## Methodology

Data from multiple sources were used to generate this report. The data source used for Chapters 2-5 include Student Reporting in Iowa (SRI), the Iowa Basic Educational Data Survey (BEDS), the Iowa Board of Educational Examiners (BOEE) database, and the Iowa Department of Education Community College Management Information System (MIS). SRI provides data on courses a student took or was taking in a given academic year, as well as student demographics. Data from the BEDS, along with data from the BOEE database provide information on K-12 CTE teachers. The MIS was used to gather information of community college faculty teaching college-credit contracted CTE courses to high school students.

Chapter 6 presents data on Career and Technical Student Organizations (CTSOs); data used in that chapter comes from the Department and the national CTSO offices.

Chapter 7 uses career guidance data from the Consolidated Accountability and Support Application and the Comprehensive School Improvement Plans. This report also utilizes data gathered from a survey administered by the Division of Community Colleges and Workforce Preparation, within the Department, for the purposes of obtaining information on regional centers (see Chapter 8).

The School Courses for the Exchange of Data (SCED) and the Classification of Instructional Programs (CIP) were used to calculate the number of secondary CTE courses and programs offered. The SCED code provides information about course topic and course subject area, while the CIP indicates what instructional program a CTE course belongs to. A unique SCED in a given school district was identified as a secondary CTE course instance. A similar approach was used to identify a secondary CTE program instance. The number of unique state student IDs was employed to indicate unduplicated secondary CTE enrollment.

## The Report Layout

The remainder of this report is divided into two main sections: Section II presents five-year longitudinal data (2012-13 to 2016-17) on participation in secondary CTE courses and programs; secondary CTE enrollment patterns; CTE student characteristics; and secondary CTE human resources. Section III briefly describes three aspects of CTE programming – CTSOs; career guidance; and regional centers – which are coming to the forefront as HF 2392 moves to full implementation across public school districts in Iowa.

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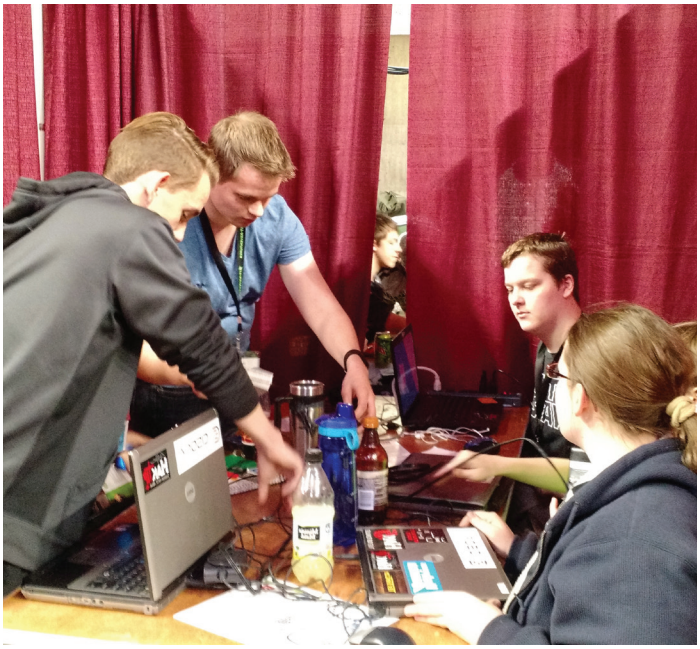
# Section II:

## *Trends in Secondary Career and Technical Education*

## *Courses and Programs, Enrollment, Student Characteristics, and Instructors*



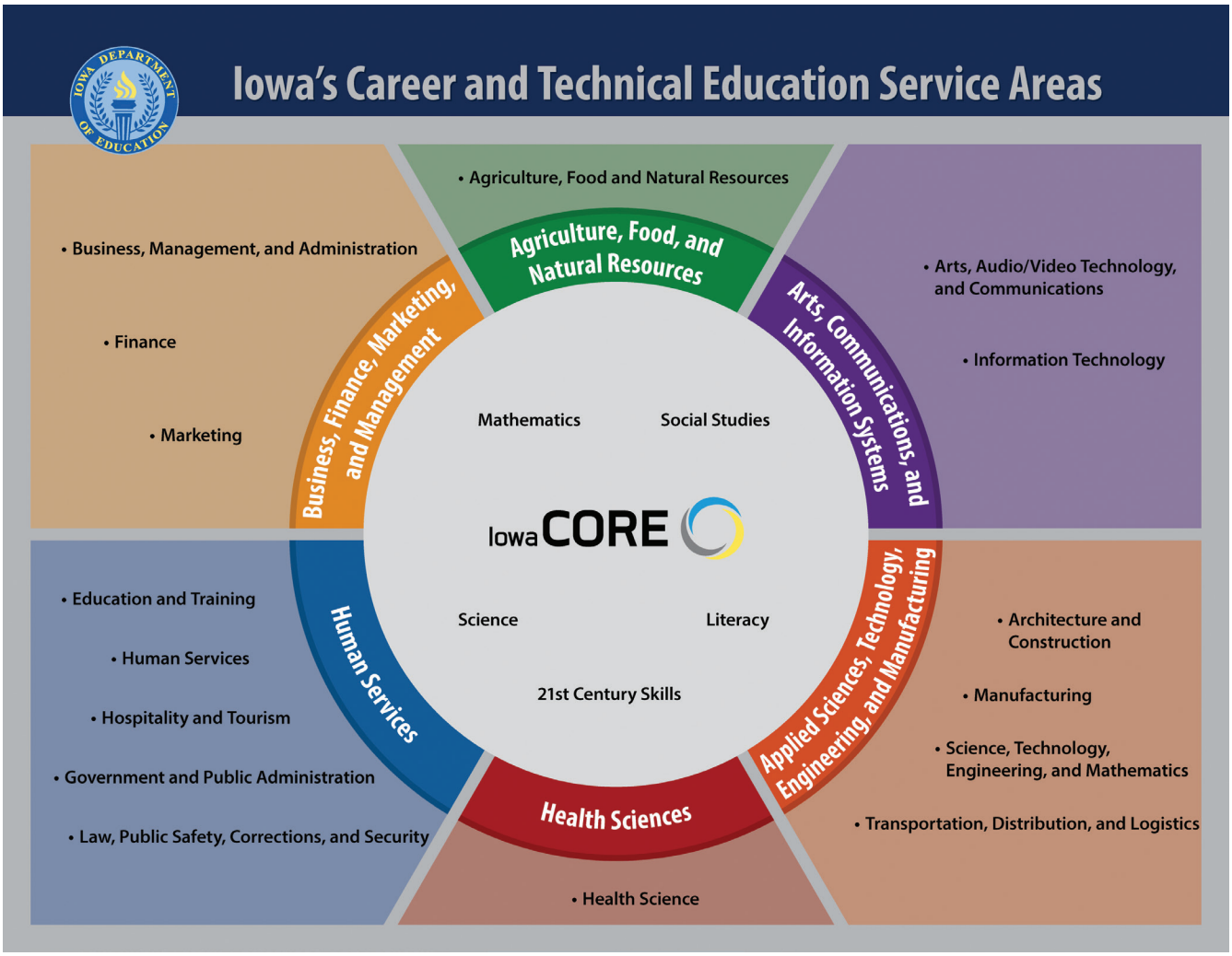
*Union High School students work together to ward off a cyber-attack during the IT Olympics.*


*Roland Story Family and Consumer Science (FCS) students present projects on children, fashion design, and food innovations at a district competition.*

## Chapter 2. Secondary CTE Courses and CTE Programs

Career and technical education's (CTE) direct and explicit focus on preparing students for specific ranges of occupations has resulted in a long history of interest and involvement in educational, occupational, and industrial classification systems. The National Career Clusters™ Framework provides a way for schools to organize instruction and student experiences around 16 broad categories that together encompass all occupations from entry through professional levels. The clusters are groupings of careers with similar skills or common themes based on industry groups. They assist students, parents, employers, and those in the educational system to understand how curriculum relates to the career opportunities from which students will choose and for which schools must prepare them. At the secondary level in Iowa's public school districts, CTE programs are organized within six service areas, as defined in Iowa Code section 256.11(5)(h). Iowa has made a conscious effort to align these service areas to the National Career Clusters™ Framework as shown in the Figure 2.1 below.

FIGURE 2.1: IOWA'S CAREER AND TECHNICAL EDUCATION SERVICE AREAS



Realigned in 2016, the six service areas broadly define the career pathway focus the student may have when s/he determines what courses and programs in which to enroll. In addition, the six service areas now being used by school districts to meet the requirement to offer and teach CTE programs have a much broader span and scope than what existed prior to the implementation of HF 2392. There were three changes to the following original six services areas: business and marketing was combined into one service area; family and consumer sciences was reconfigured as human services to include a wider array of programs; and information solutions was introduced as a new service area to reflect the importance of the corresponding career clusters to current and future workforce needs.

## Secondary CTE Courses and Programs

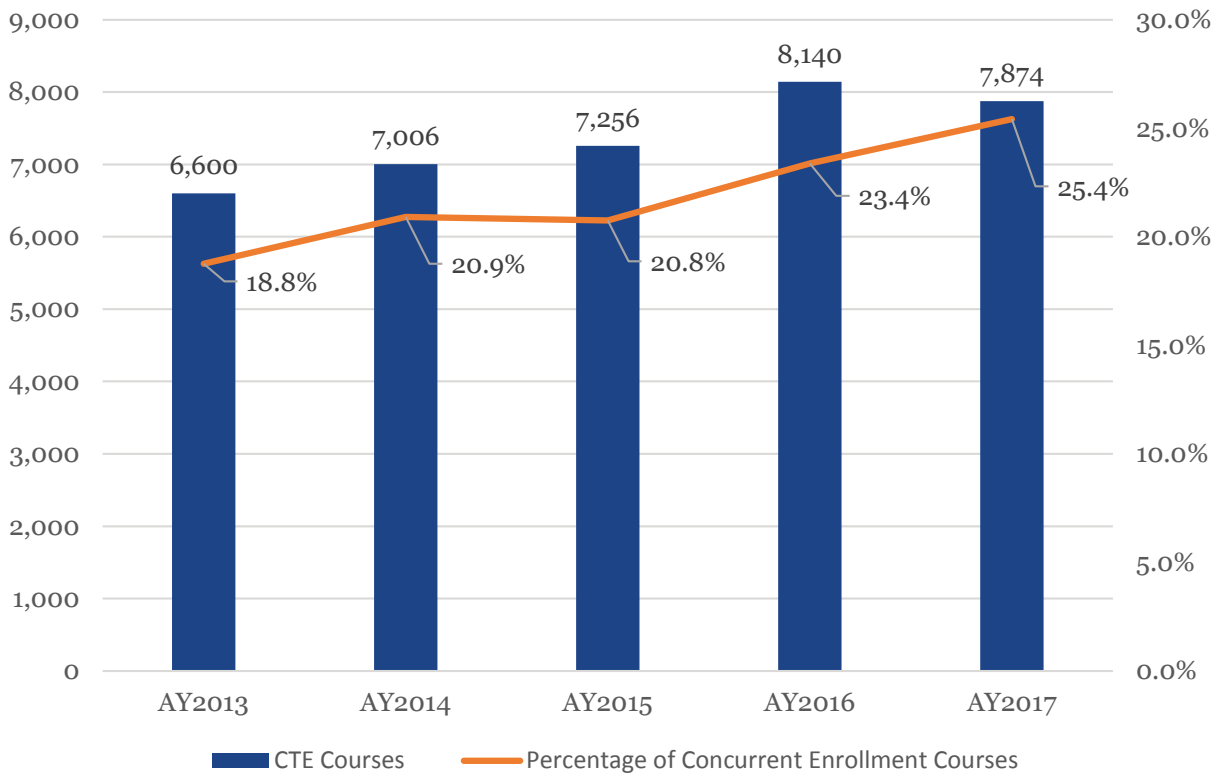
Iowa Code (Chapter 12) requires that every public school district offer and teach a minimum of three sequential CTE units within at least four of the six service areas. Each unit may consist of one or more courses depending on classroom and lab time; however, the most common configuration is a (Carnegie) unit comprised of two 0.50 unit courses. These three sequential CTE units equate to a basic CTE program. This report defines a course as a combination of a particular SCED code within a specific school district, resulting in a course instance. Similarly, a program is defined as a particular CIP code within a specific school district, resulting in a program instance.

Additionally, secondary students in Iowa have access to college-credit coursework through an array of options, most of which are at no (or low) cost to the student/family. Reported throughout this document are the data of college-credit CTE courses contracted with one or more of the community colleges in Iowa. This section summarizes all of the CTE courses and CTE programs taught during AY2013-AY2017 for students in grades 9 through 12 in Iowa.

Figure 2.2 presents secondary CTE courses taught since AY2013. The number of secondary CTE courses peaked in AY2016, with 8,140 courses taught statewide. The number of secondary CTE courses increased by 19.3 percent over the past five years. Figure 2.2 also presents the change of college-credit contracted CTE courses. The proportion of college-credit contracted CTE courses increased steadily. In AY2013, these courses only accounted for 18.8 percent of the total secondary CTE courses, whereas in AY2017, 25.4 percent of all secondary CTE courses were college-credit contracted courses.

Table 2.1 displays the average number of CTE courses taught by school district size; Table 2.2 shows the average number of college-credit contracted CTE courses by school district size. In this report, school district size was indicated by high school student enrollment. More information on high school enrollment can be obtained at https://www.educateiowa.gov/education-statistics.

**FIGURE 2.2: NUMBER OF CTE COURSES AND PROPORTION OF COLLEGE-CREDIT CONTRACTED CTE COURSES: AY2013-AY2017**



The average number of both CTE courses and college-credit contracted CTE courses increased regardless of school size. In terms of five-year change, school districts with a high school enrollment of 500-1,249 increased 88.0 percent, followed by school districts with high school enrollments of 1,250-3,999, and those with high school enrollments of 100-299. It appears that the number of CTE courses and the number of college-credit contracted CTE courses were positively correlated to school district size, as larger schools taught more of both levels of CTE courses (see Tables 2.1 and 2.2).

### TABLE 2.1: AVERAGE NUMBER OF CTE COURSES BY SCHOOL DISTRICT SIZE

| High School Student Enrollment | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 | Five-Year Change |
|---|---|---|---|---|---|---|
| <100 | 14.3 | 14.9 | 15.4 | 17.9 | 16.2 | 13.3% |
| 100-299 | 18.7 | 19.5 | 20.5 | 23.0 | 22.8 | 21.9% |
| 300-499 | 23.7 | 25.3 | 26.5 | 29.5 | 28.3 | 19.4% |
| 500-1249 | 24.2 | 26.5 | 27.6 | 30.7 | 30.8 | 27.3% |
| 1250-3999 | 29.6 | 33.1 | 33.1 | 36.8 | 36.3 | 22.6% |
| >4000 | 60.0 | 72.7 | 63.5 | 70.0 | 65.8 | 9.7% |
| **Total** | **21.0** | **22.4** | **23.4** | **26.3** | **25.7** | **22.4%** |

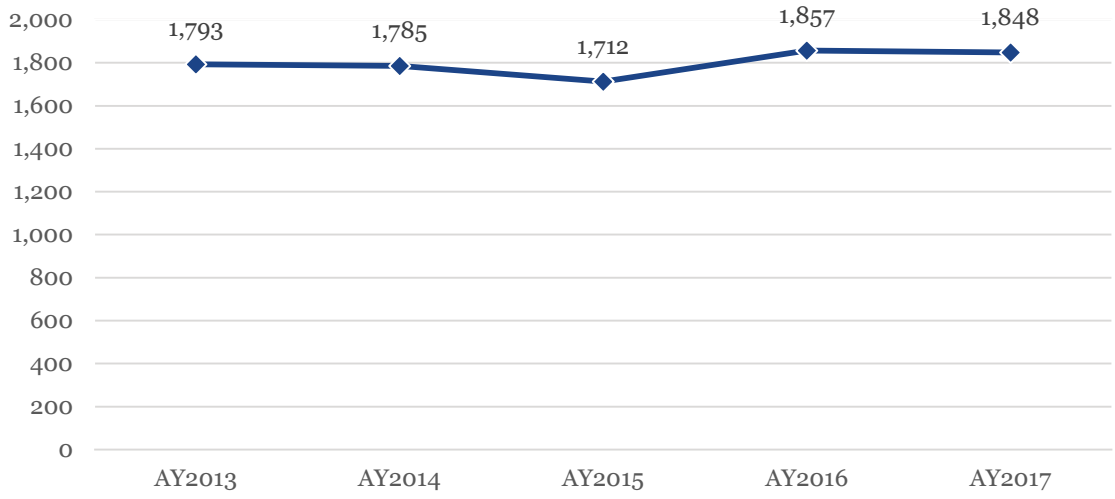
### TABLE 2.2: AVERAGE COLLEGE-CREDIT CTE COURSES BY SCHOOL DISTRICT SIZE

| High School Student Enrollment | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 | Five-Year Change |
|---|---|---|---|---|---|---|
| <100 | 1.6 | 1.8 | 1.7 | 2.9 | 2.5 | 56.3% |
| 100-299 | 2.7 | 3.0 | 3.2 | 4.2 | 4.7 | 74.1% |
| 300-499 | 5.4 | 5.7 | 6.1 | 7.2 | 7.2 | 33.3% |
| 500-1249 | 5.0 | 6.7 | 6.7 | 8.5 | 9.4 | 88.0% |
| 1250-3999 | 7.8 | 10.9 | 10.4 | 12.7 | 13.7 | 75.6% |
| >4000 | 28.0 | 35.7 | 30.8 | 34.0 | 34.3 | 22.5% |
| **Total** | **3.9** | **4.7** | **6.0** | **6.1** | **6.5** | **66.7%** |

Figure 2.3 displays the total number of secondary CTE programs (at least three units of sequential CTE coursework aligning with a CIP code) taught since AY2013. As shown in Figure 2.3, the number of CTE programs decreased in AY2014 and AY2015, and peaked in AY2016 (n=1,857). Although there was a slight decrease in AY2017, there was a 3.1 percent increase compared to AY2013. It should be noted in starting in AY2016, the Department began using a different electronic platform for school districts to report the CTE courses and programs they offer and teach each year.

Table 2.3 presents the average number of CTE programs taught by school district size. It appears that in larger schools, more CTE programs were taught each academic year. In school districts with more than 4,000 high school students, on average 14.7 CTE programs were taught each year. Although smaller schools provided fewer programs, the average number of CTE programs taught in these schools increased during the past five years. Statewide, the average number of secondary CTE programs increased 5.3 percent.

### FIGURE 2.3: NUMBER OF SECONDARY CTE PROGRAMS: AY2013-AY2017




### TABLE 2.3: AVERAGE NUMBER OF CTE PROGRAMS BY SCHOOL DISTRICT SIZE

| High School Student Enrollment | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 | Five-Year Change |
|---|---|---|---|---|---|---|
| <100 | 4.3 | 4.4 | 4.4 | 4.7 | 4.6 | 7.0% |
| 100-299 | 4.9 | 4.8 | 4.7 | 5.1 | 5.2 | 6.1% |
| 300-499 | 6.3 | 6.2 | 5.9 | 6.3 | 6.3 | 0.0% |
| 500-1249 | 6.8 | 7 | 6.7 | 7.3 | 7.4 | 8.8% |
| 1250-3999 | 9.3 | 9.4 | 8.7 | 9.7 | 9.7 | 4.3% |
| >4000 | 15.0 | 15.0 | 14.0 | 14.5 | 15.0 | 0.0% |
| **Total** | **5.7** | **5.7** | **5.5** | **6** | **6** | **5.3%** |

Table 2.4 breaks down secondary CTE programs by career cluster. As shown in Table 2.4, business management and administration was the career cluster with most CTE programs over the past five years; approximately 300 programs in this career cluster were provided each year. In each of the education and training, agriculture, food and natural resources, and architecture and construction career clusters, more than 200 programs were provided each year. In each of three career clusters (health sciences, manufacturing, and transportation, distribution and logistics), more than 100 programs were offerred.

**TABLE 2.4: NUMBER OF CTE PROGRAMS BY CAREER CLUSTER**

| Career Cluster | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| Agriculture, Food, and Natural Resources | 254 | 255 | 252 | 261 | 263 |
| Architecture and Construction | 234 | 235 | 234 | 249 | 261 |
| Arts, Audio/Video Technology, and Communications | 13 | 13 | 13 | 14 | 14 |
| Business Management and Administration | 311 | 323 | 299 | 309 | 303 |
| Education and Training | 292 | 286 | 271 | 275 | 269 |
| Finance | 39 | 37 | 29 | 28 | 27 |
| Health Sciences | 135 | 137 | 132 | 144 | 152 |
| Hospitality and Tourism | 39 | 43 | 48 | 58 | 68 |
| Human Services | 11 | 11 | 11 | 11 | 12 |
| Information Technology | 41 | 35 | 28 | 31 | 31 |
| Law, Public Safety, Corrections, and Security | 16 | 14 | 14 | 17 | 18 |
| Manufacturing | 138 | 143 | 133 | 180 | 184 |
| Marketing | 64 | 63 | 65 | 69 | 61 |
| Science, Technology, Engineering and Mathematics | 87 | 75 | 71 | 84 | 65 |
| Transportation, Distribution and Logistics | 119 | 115 | 112 | 127 | 120 |
| **Total** | **1,793** | **1,785** | **1,712** | **1,857** | **1,848** |

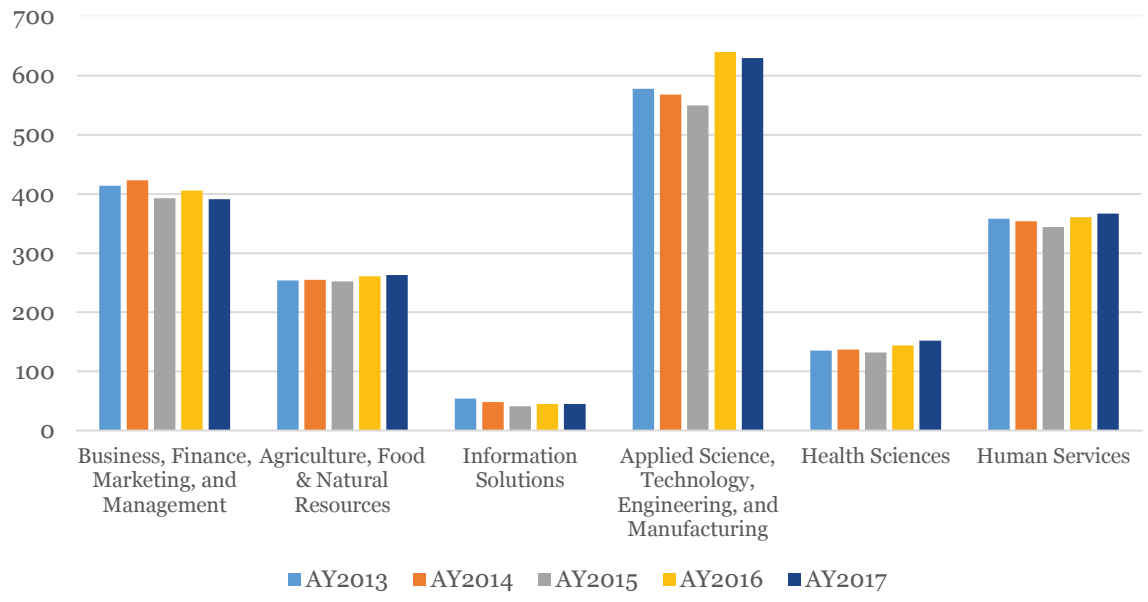
Table 2.5 breaks down CTE programs by service area, and demonstrates that applied science, technology, engineering, and manufacturing was the largest service area, with more than 550 programs taught each academic year. By contrast, information solutions was the smallest service area, with approximately 45 programs provided each academic year.

With regards to increases and decreases in secondary CTE programs (Figure 2.4), the business, finance, marketing, and management, and information solutions service areas experienced 5.6 percent and 13.5 percent of decrease respectively. However, the number of programs increased in each of the remaining four service areas, with health science seeing the greatest percent increase: agriculture, food and natural resources (3.5 percent), applied science, technology, engineering, and manufacturing (8.6 percent), health sciences (12.6 percent), and human services (2.5 percent).

**TABLE 2.5: NUMBER OF SECONDARY CTE PROGRAMS BY SERVICE AREA**

| Service | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| Business, Finance, Marketing, and Management | 414 | 423 | 393 | 406 | 391 |
| Agriculture, Food, and Natural Resources | 254 | 255 | 252 | 261 | 263 |
| Information Solutions | 54 | 48 | 41 | 45 | 45 |
| Applied Science, Technology, Engineering, and Manufacturing | 578 | 568 | 550 | 640 | 630 |
| Health Sciences | 135 | 137 | 132 | 144 | 152 |
| Human Services | 358 | 354 | 344 | 361 | 367 |
| **Total** | **1,793** | **1,785** | **1,712** | **1,857** | **1,848** |

**FIGURE 2.4: NUMBER OF SECONDARY CTE PROGRAMS: AY2013-AY2017**

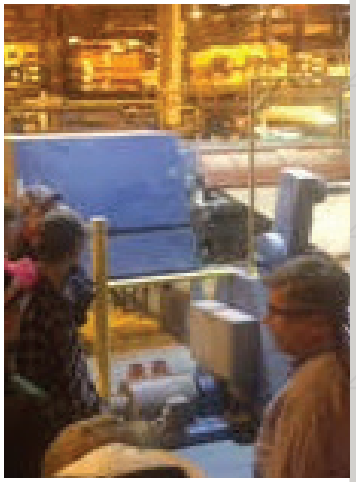


## Chapter Highlights

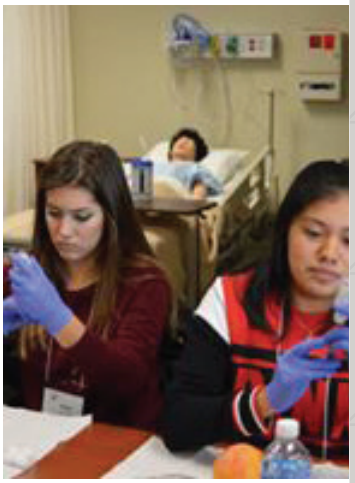
From the tables and figures presented in this chapter, the following can be said:

- In general, the total number of secondary CTE courses and programs offered was generally steady, with only minor shifts up and down over the five-year period.
- Significant growth in the use of college-credit contracted courses in secondary CTE programs occurred over the five-year period, but relatively more so by larger school districts than smaller ones.
- At the level of service areas, the growth in CTE programs was similar with some going down and others going up.

*Waterloo West High School culinary arts student.*



*Students tour Norplex Micarta in Postville.*



*Students in Northeast Iowa learning more about different health care careers.*

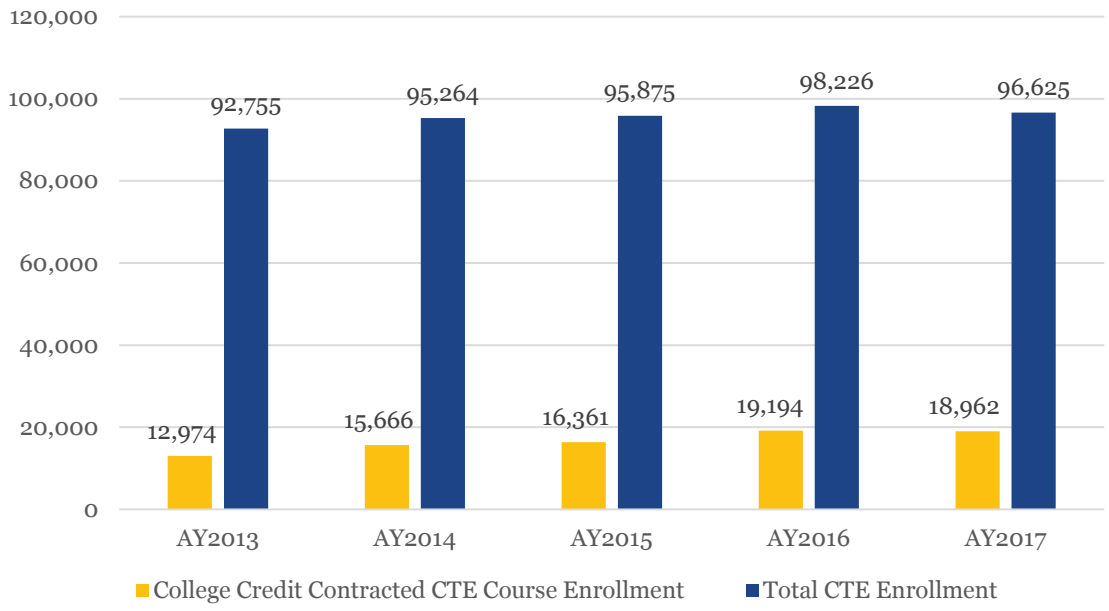
# Chapter 3. Secondary CTE Enrollment

This chapter summarizes secondary CTE enrollment since AY2013. These high school students took at least one CTE course in one academic year and were identified as CTE students. It should be noted that while school districts are required to offer and teach a minimum of three units in at least four of the six service areas, high school students are free to determine the extent to which they will enroll and complete CTE courses and programs.

## Trends in Secondary CTE Enrollment

Figure 3.1 displays secondary CTE enrollment since AY2013. The number of students enrolled in secondary CTE courses peaked in AY2016 (n=98,226). In AY2017, there were 96,625 high school students enrolled in at least one CTE course. Although this suggests a 1.6 percent decrease from the previous academic year, it is still a 4.2 percent increase from AY2013. Students who took at least one college-credit contracted CTE course were identified as college-credit CTE students. Figure 3.1 also presents the number of college-credit contracted CTE students during the past five years. Although students in college-credit contracted CTE courses accounted for less than 20 percent of total secondary CTE enrollment, this group of students increased 46.2 percent from 12,974 in AY2013 to 18,962 in AY2017.

**FIGURE 3.1: SECONDARY CTE ENROLLMENT: AY2013-AY2017**



During the past five years, the secondary CTE participation rate in Iowa was approximately 65 percent. As shown in Figure 3.2, the proportion of CTE enrollment in grades 9-12 increased from 63.8 percent in AY2013 to 65.3 percent in AY2017. AY2016 had the highest participation rate, 66.5 percent. The change in secondary CTE participation rate is in accordance with the change in total secondary CTE enrollment.

Figure 3.3 displays enrollment by school district size. In this report, school district size was indicated by high school student enrollment. It appears that, on average, school districts with an enrollment of 100-299 high school students, had the largest secondary CTE enrollment. For instance, school districts where the high school enrollment is 100-299, students have a total CTE course enrollment of 23,030 in AY2017.

**FIGURE 3.2: SECONDARY CTE PARTICIPATION RATE: AY2013-AY2017**

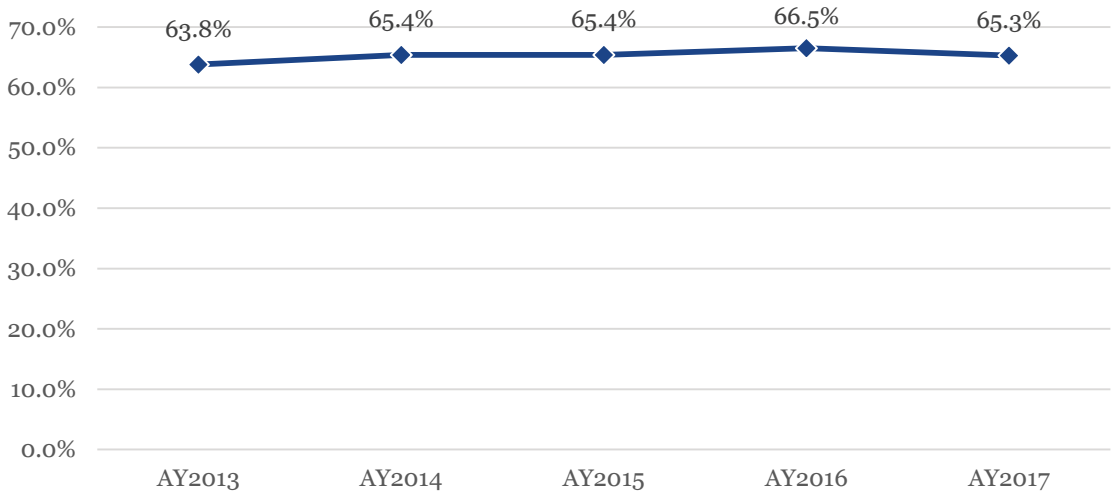



**FIGURE 3.3: SECONDARY CTE ENROLLMENT BY SCHOOL DISTRICT SIZE: AY2013-AY2017**

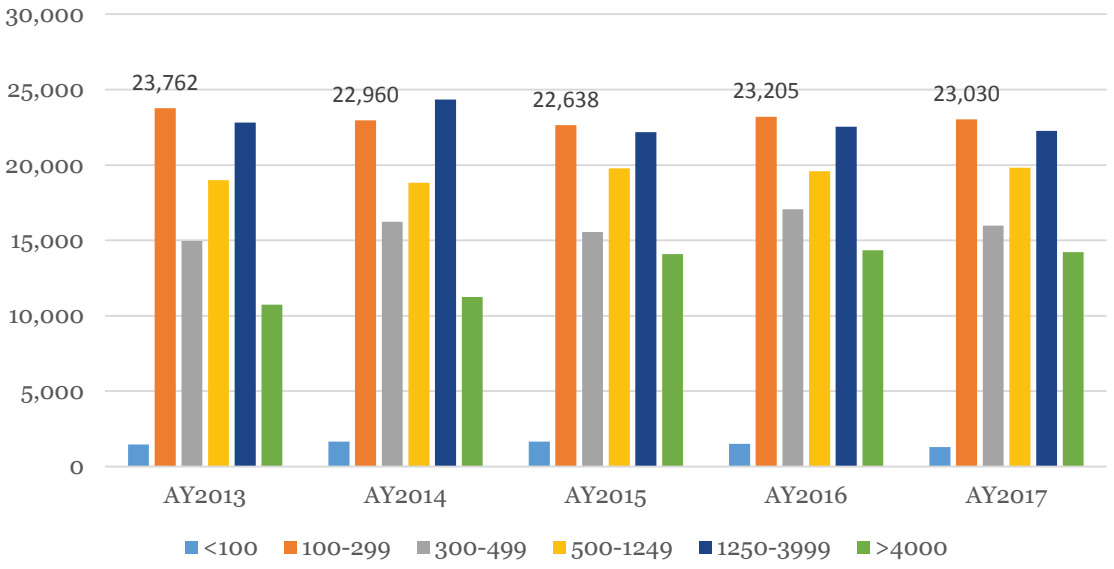


Figure 3.4 and Table 3.1 summarize CTE participation rate by school district size. School districts with an enrollment of 100-299 high school students, also had highest secondary CTE participation rate (five-year average is 74.4 percent). Although school districts with high school enrollment less than 100 had the smallest secondary CTE enrollment, the participation rate for this group was pretty high—on average, 72.3 percent. Comparatively, schools districts with high school enrollment of 1,250-3,999 had the lowest CTE participation rate (five-year average is 56.5 percent), even though this group contributed approximately 24 percent of the total secondary CTE enrollment statewide.

**FIGURE 3.4: SECONDARY CTE PARTICIPATION RATE BY SCHOOL DISTRICT SIZE: AY2013-AY2017**

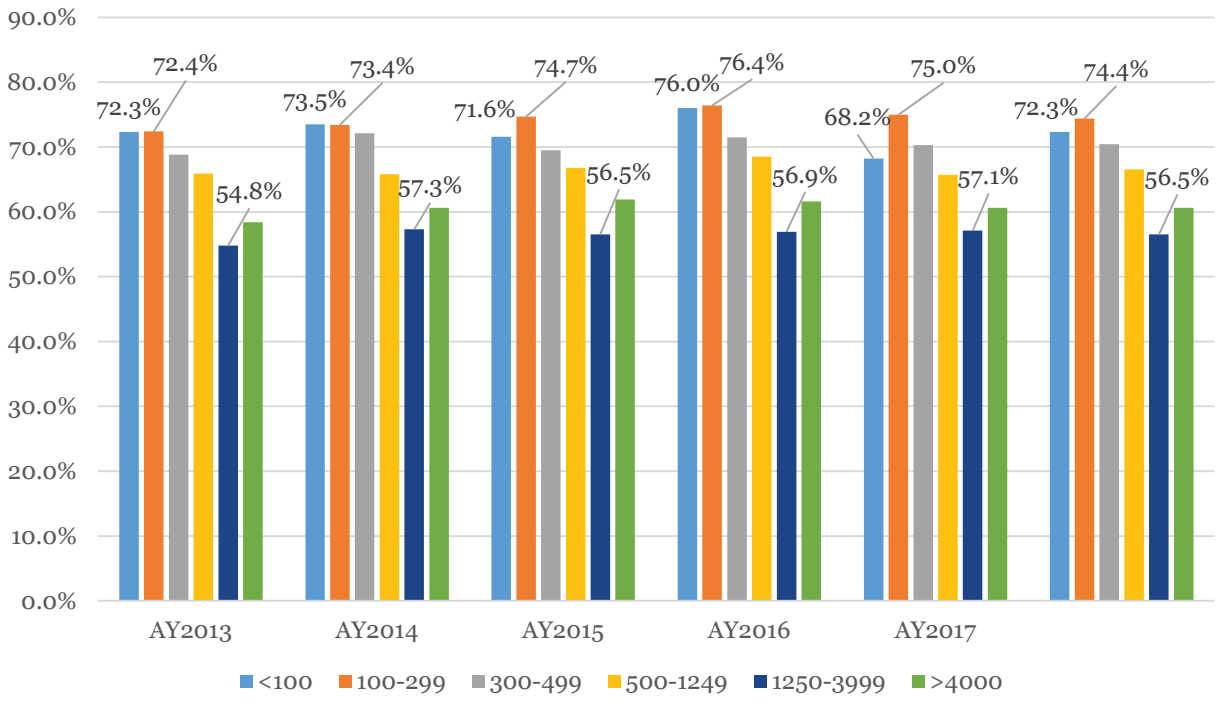



**TABLE 3.1: SECONDARY CTE PARTICIPATION RATE BY SCHOOL DISTRICT SIZE: AY2013-AY2017**

| High School Student Enrollment | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| <100 | 72.3% | 73.5% | 71.6% | 76.0% | 68.2% |
| 100-299 | 72.4% | 73.4% | 74.7% | 76.4% | 75.0% |
| 300-499 | 68.8% | 72.1% | 69.5% | 71.5% | 70.3% |
| 500-1249 | 65.9% | 65.8% | 66.8% | 68.5% | 65.7% |
| 1250-3999 | 54.8% | 57.3% | 56.5% | 56.9% | 57.1% |
| >4000 | 58.4% | 60.6% | 61.9% | 61.6% | 60.6% |
| **Total** | **63.8%** | **65.4%** | **65.4%** | **66.5%** | **65.3%** |

Table 3.2 summarizes the percentage of college-credit CTE enrollment of the total secondary CTE enrollment by school district size. It appears that this percentage positively correlates to school district size: students in larger school districts were more likely to have taken college-credit contracted CTE courses. For example, in AY2017, school districts with less than 100 high school students saw only 12.1 percent of secondary CTE students enroll in at least one college-credit contracted CTE course, compared to 29.4 percent of CTE students in school districts with a high school enrollment of more than 4,000. It is also worth mentioning that, statewide, the percentage of college-credit contracted CTE enrollment increased from 14.0 percent in AY2013 to 19.6 percent in AY2017.

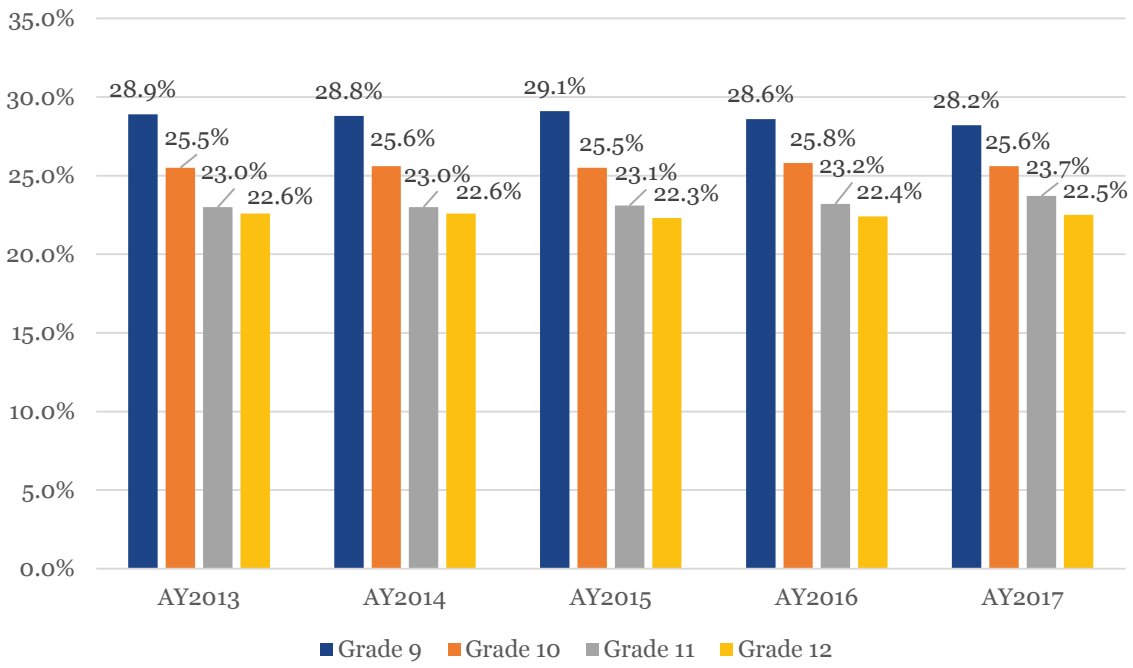
Figure 3.5 presents secondary CTE enrollment by grade level. The pattern of CTE enrollment by grade level stayed the same over the past five years: 9th graders were the largest group (on average 28.7 percent), followed by 10th graders (on average 25.6 percent); students in grades 11 and 12 respectively accounted for 23.2 percent and 22.5 percent of the total secondary CTE enrollment.

Table 3.3 summarizes the enrollment by service area. It appears that courses in business, finance, marketing, and management are most popular among secondary students. During each year measured (AY2013-AY2017), approximately 40,000 students took at least one course in this service area. Courses in human services and those in applied science, technology, engineering, and manufacturing were also popular among high school students: on average, more than 30,000 students took at least one course in the two service areas. The enrollment increased in agriculture, food and natural resources (12.7 percent), informational solutions (23.6 percent), applied science, technology, engineering, and manufacturing (5.6 percent), health sciences (11.9 percent), and human services (12.9 percent), whereas there was a 4.0 percent decrease in business, finance, marketing, and management. Figure 3.6 displays the change in enrollment by service area.

**TABLE 3.2: PERCENTAGE OF COLLEGE-CREDIT CONTRACTED CTE ENROLLMENT BY SCHOOL DISTRICT SIZE: AY2013-AY2017**

| High School Student Enrollment | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| <100 | 9.7% | 10.3% | 8.6% | 12.1% | 12.1% |
| 100-299 | 8.9% | 9.2% | 10.0% | 12.3% | 13.3% |
| 300-499 | 12.1% | 13.0% | 15.2% | 16.3% | 15.8% |
| 500-1249 | 14.1% | 17.6% | 16.9% | 19.9% | 19.1% |
| 1250-3999 | 18.0% | 21.2% | 20.9% | 24.6% | 23.6% |
| >4000 | 19.8% | 24.7% | 25.7% | 27.4% | 29.4% |
| **Total** | **14.0%** | **16.4%** | **17.1%** | **19.5%** | **19.6%** |

## FIGURE 3.5: SECONDARY CTE ENROLLMENT BY GRADE LEVEL: AY2013-AY2017

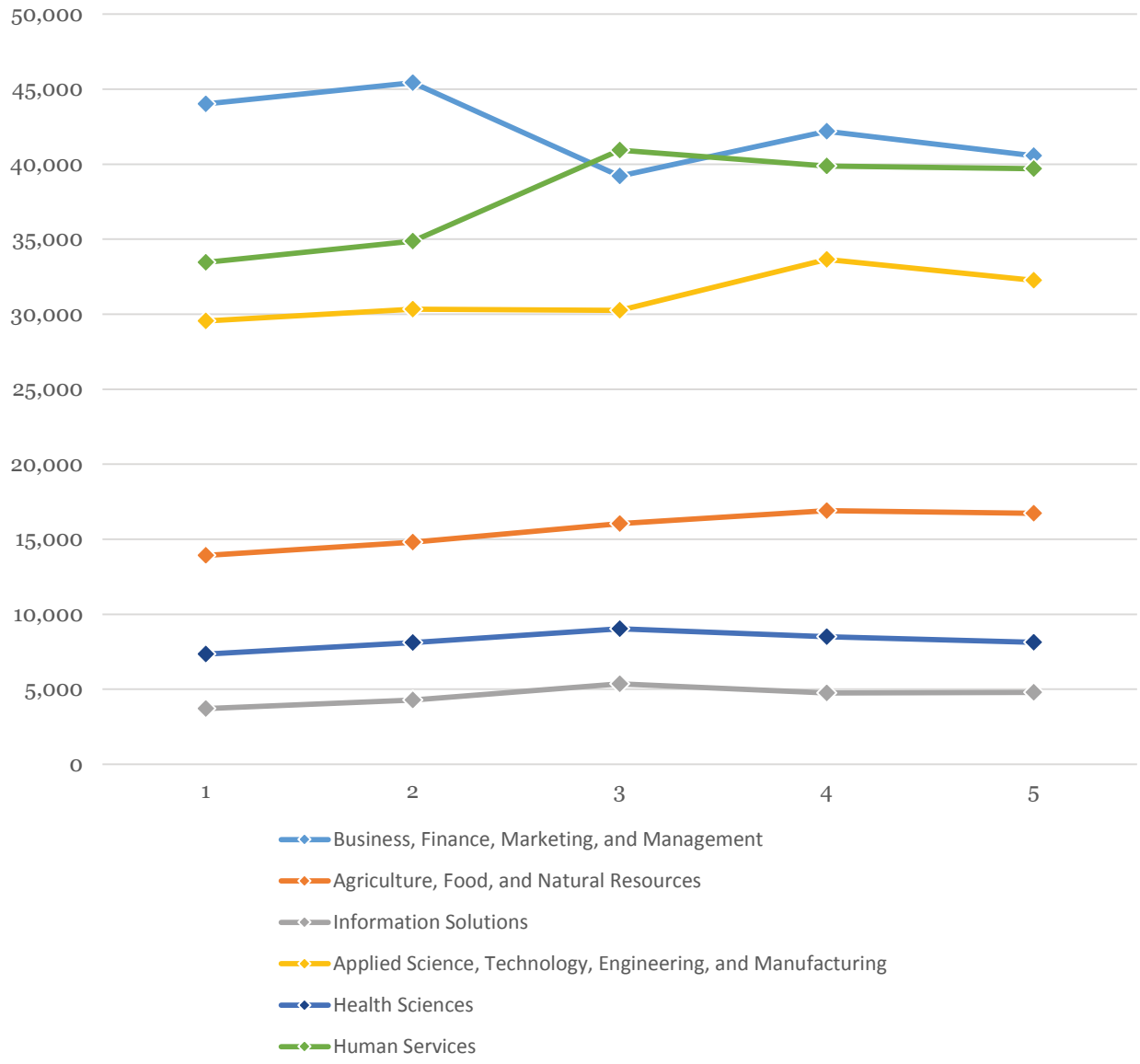



## TABLE 3.3: SECONDARY CTE ENROLLMENT BY SERVICE AREA

| Service Area | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 | Five-Year Change |
|---|---|---|---|---|---|---|
| Business, Finance, Marketing, and Management | 44,024 | 45,425 | 39,197 | 42,190 | 40,567 | -4.0% |
| Agriculture, Food and Natural Resources | 13,909 | 14,809 | 16,034 | 16,898 | 16,735 | 12.7% |
| Information Solutions | 3,701 | 4,275 | 5,351 | 4,744 | 4,795 | 23.6% |
| Applied Science, Technology, Engineering, and Manufacturing | 29,549 | 30,339 | 30,251 | 33,643 | 32,248 | 5.6% |
| Health Sciences | 7,349 | 8,112 | 9,023 | 8,509 | 8,133 | 11.9% |
| Human Services | 33,449 | 34,876 | 40,924 | 39,869 | 39,704 | 12.9% |

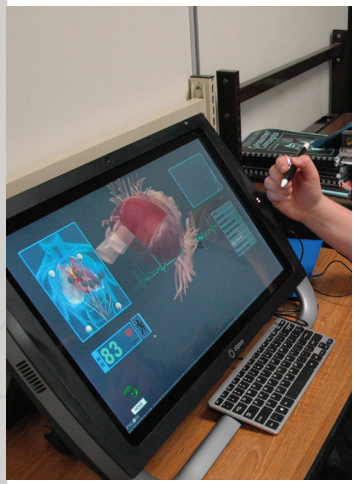
***Note:*** *Students can take CTE courses across different service areas and thus may be counted multiple times.*

## FIGURE 3.6: ENROLLMENT CHANGE IN SERVICE AREAS AY2013-2017



*West Delaware Community School students demonstrate a welding simulator.*

*Food presentation is key for Cedar Rapids students.*



*Students are taught in-demand skills at North Iowa school districts.*

## Chapter Highlights

From the tables and figures presented in this chapter the following can be said:

- While overall enrollment in secondary CTE remained steady, as well as overall secondary CTE participation rates, there was significant growth in student participation in college-credit contracted CTE courses during the past five years.
- Students in smaller school districts were participating at relatively higher rates in secondary CTE, while college-credit contracted CTE participation rates were much lower. The reverse is true for relatively larger school districts.
- CTE student enrollment by grade level tends to decline after 9th grade, with the lowest enrollment seen in the 12th grade.
- Other than Business, Finance, Marketing, and Management, which showed a decrease in participation, all service areas showed increased enrollment during the past five years.

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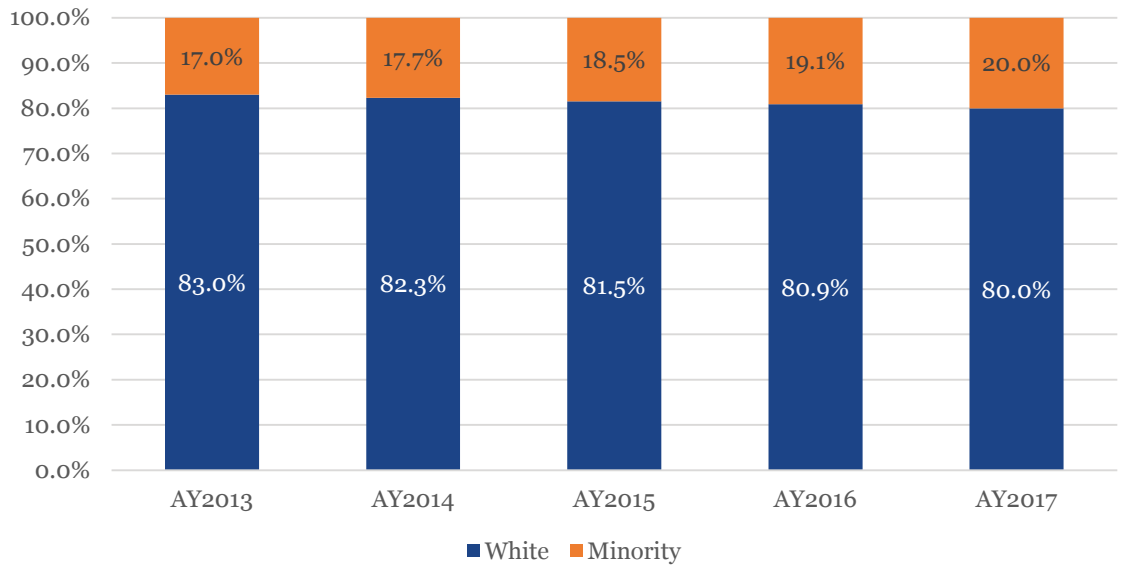
# Chapter 4. Characteristics of Secondary CTE Students

Who takes CTE courses while in high school and what that does that distribution look like across student characteristics like gender, ethnicity, and free and reduced lunch? This chapter describes the characteristics of secondary CTE students. It also describes how secondary CTE students are distributed across grade levels and by the number of CTE courses they take in a given academic year.

## Demographics of Secondary CTE Students

Among all secondary CTE students, white students comprised the largest race/ethnical group. Figure 4.1 displays the proportions of white students and of minority students enrolled in secondary CTE programs. The percentage of minority secondary CTE students increased steadily from 17.0 percent in AY2013 to 20.0 percent in AY2017. Hispanic students comprised the largest minority group (on average, 46.7 percent), followed first by Black students (on average, 25.5 percent), and then by students who reported more than one race (on average, 13.3 percent) (see Table 4.1).

**FIGURE 4.1: PROPORTION OF WHITE VS. MINORITY SECONDARY CTE STUDENTS: AY2013-AY2017**



### TABLE 4.1: DISTRIBUTION OF MINORITY SECONDARY CTE STUDENTS: AY2013-AY2017

| Race/Ethnicity | AY2013 | | AY2014 | | AY2015 | | AY2016 | | AY2017 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Hispanic | 7,323 | 46.5 | 7,771 | 46.2 | 8,221 | 46.4 | 8,844 | 47.2 | 9,157 | 47.4 |
| Black | 4,094 | 26.0 | 4,340 | 25.8 | 4,573 | 25.8 | 4,638 | 24.8 | 4,818 | 24.9 |
| More than one | 1,985 | 12.6 | 2,241 | 13.3 | 2,336 | 13.2 | 2,595 | 13.9 | 2,603 | 13.5 |
| Asian | 1,806 | 11.5 | 1,951 | 11.6 | 2,099 | 11.8 | 2,146 | 11.5 | 2,193 | 11.4 |
| American Indian/ Alaskan Native | 406 | 2.6 | 390 | 2.3 | 343 | 1.9 | 341 | 1.8 | 340 | 1.8 |
| Pacific Islanders | 122 | 0.8 | 127 | 0.8 | 151 | 0.9 | 162 | 0.9 | 201 | 1.0 |
| **Total** | **15,736** | | **16,820** | | **17,723** | | **18,726** | | **19,312** | |

Figure 4.2 summarizes the enrollment of secondary CTE students by gender. During the past five years, there were more male CTE students than female CTE students. Although the number of female students enrolled in CTE courses increased from 42,138 in AY2013 to 43,200 in AY2017, a 2.5 percent increase, the proportion of female students slightly decreased from 45.5 percent to 44.7 percent.

The proportion of secondary CTE students who were eligible for the federal free or reduced-priced meals program is shown in Figure 4.3. The percentage of students eligible for free or reduced-priced meals fluctuated between 34.8 percent and 36.4 percent during the past five years.

### FIGURE 4.2: PROPORTION OF MALE AND FEMALE SECONDARY CTE STUDENTS

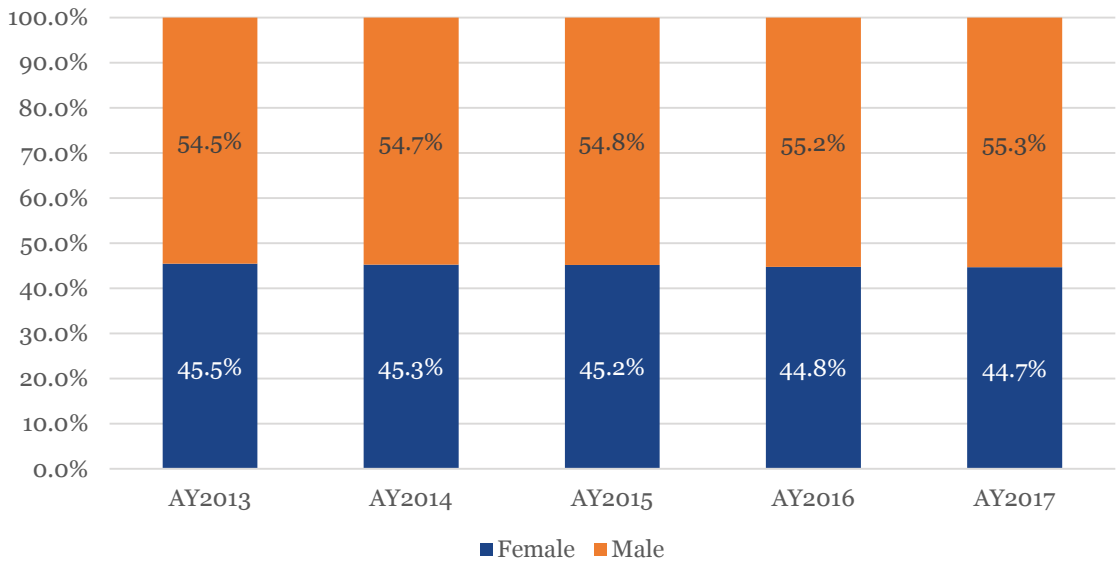
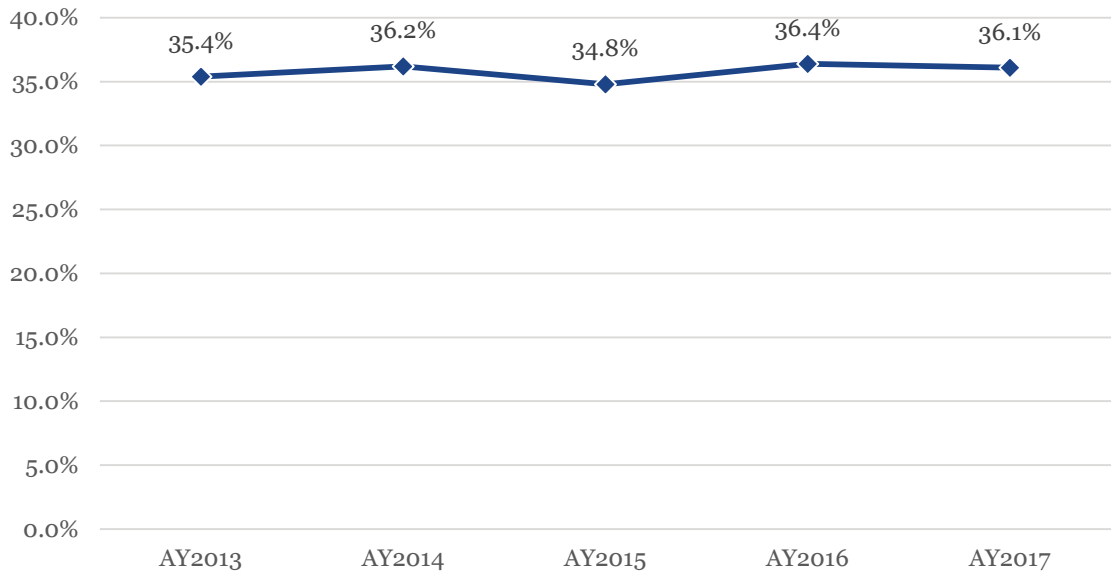


**FIGURE 4.3: PROPORTION OF CTE STUDENTS WHO WERE ELIGIBLE FOR FREE AND REDUCED PRICE SCHOOL MEALS**

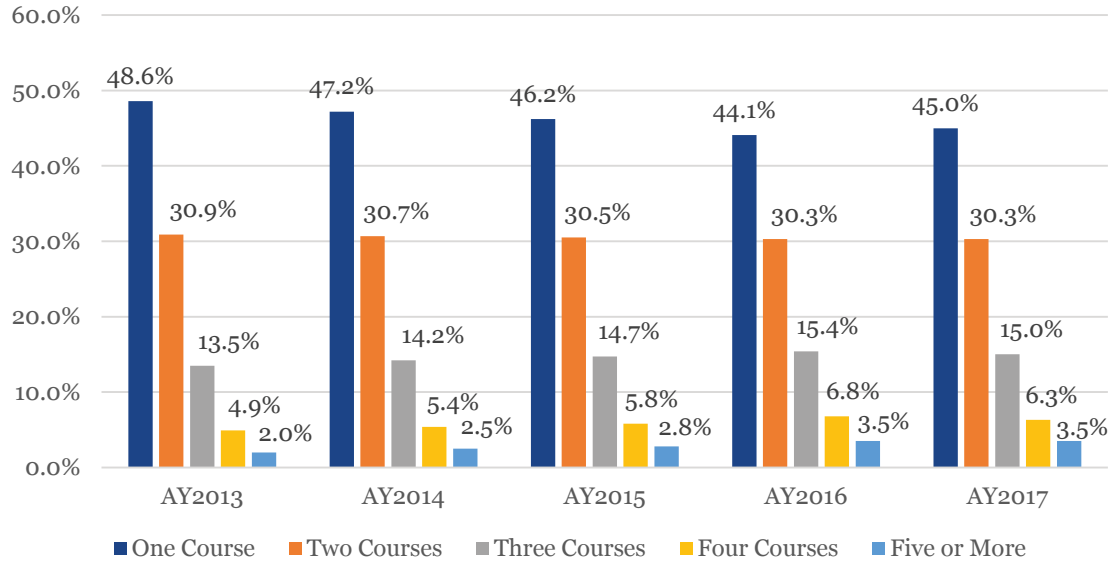



## Trends in CTE Course Taking by Secondary Students

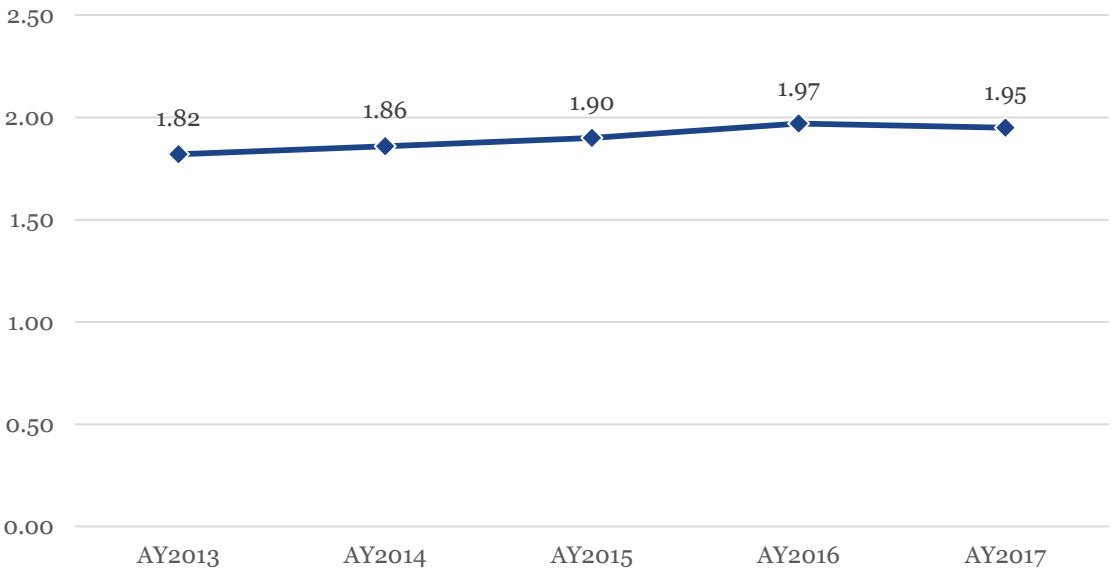
Figure 4.4 displays the distribution of number of CTE courses (both secondary and college-credit contracted) taken per student since AY2013. There was not a large variation during the past five years. On average, 46 percent of secondary students took one CTE course in an academic year, and approximately 30 percent of secondary students took two CTE courses. Although not many students took five or more CTE courses in an academic year (less than four percent), the proportion of these students increased steadily from 2.0 percent in AY2013 to 3.5 percent in AY2017. The proportions of secondary students who took three or four CTE courses per academic year also increased over the years.

With regard to the average number of CTE courses taken per student, there was a 7.4 percent increase. In AY2017, on average, secondary students enrolled in 1.95 CTE courses, compared to 1.82 in AY2013 (Figure 4.5).

## FIGURE 4.4: DISTRIBUTION OF SECONDARY STUDENTS BY NUMBER OF CTE COURSES



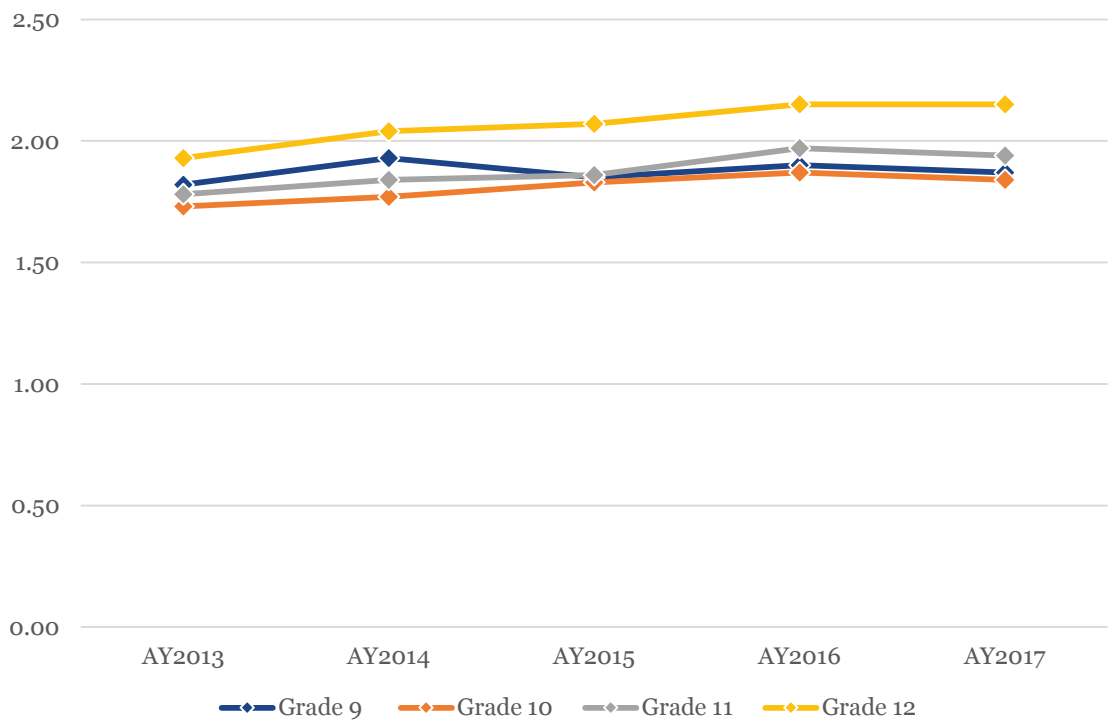

## FIGURE 4.5: THE CHANGE OF AVERAGE CTE COURSES TAKEN BY STUDENTS



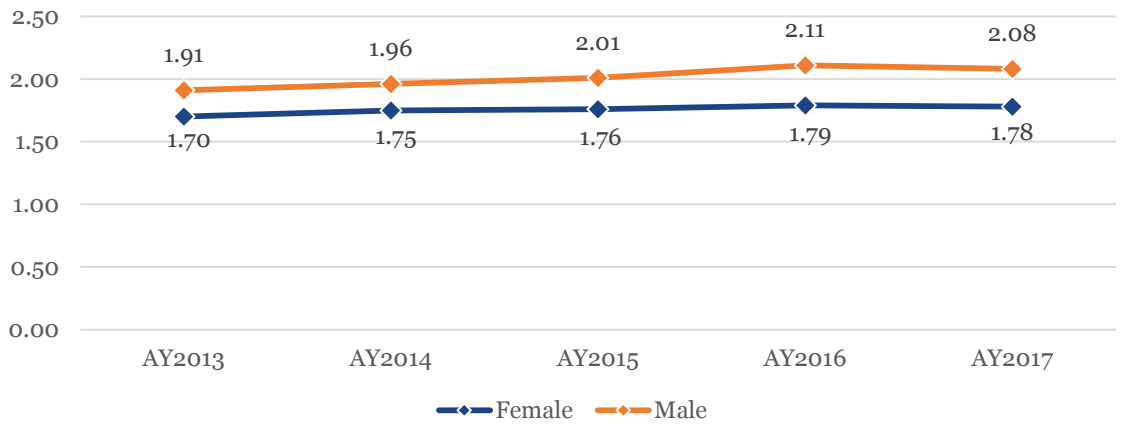
On average, students in 12th grade appeared to take more CTE courses per academic year than students in other grades (Figure 4.6).

Figures 4.7 through 4.9 demonstrate the following: Male secondary students took more CTE courses than female students; White secondary students took more CTE courses than minority students; and, the difference between secondary CTE students who were eligible for free and reduced-price meals and those who were not eligible was not salient.

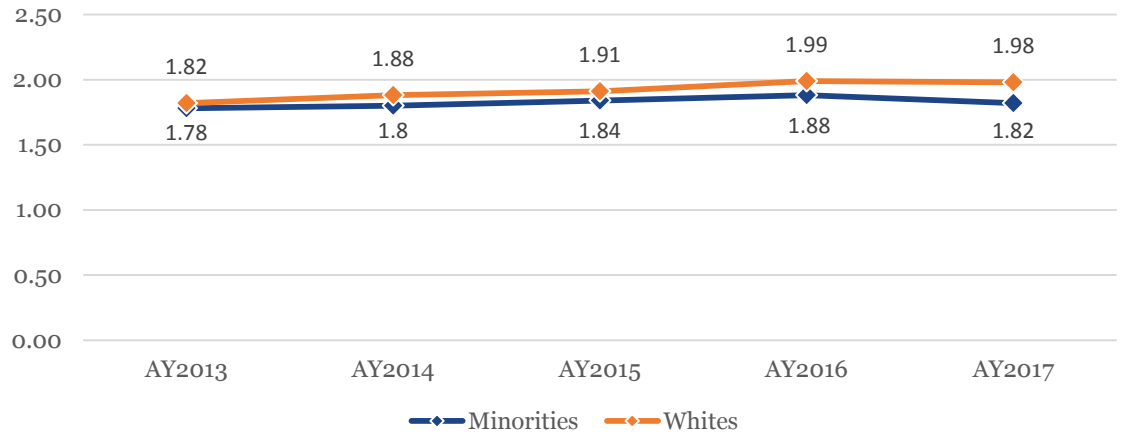
**FIGURE 4.6: COMPARISON OF AVERAGE NUMBER OF CTE COURSES TAKEN BY 9TH-12TH GRADERS**



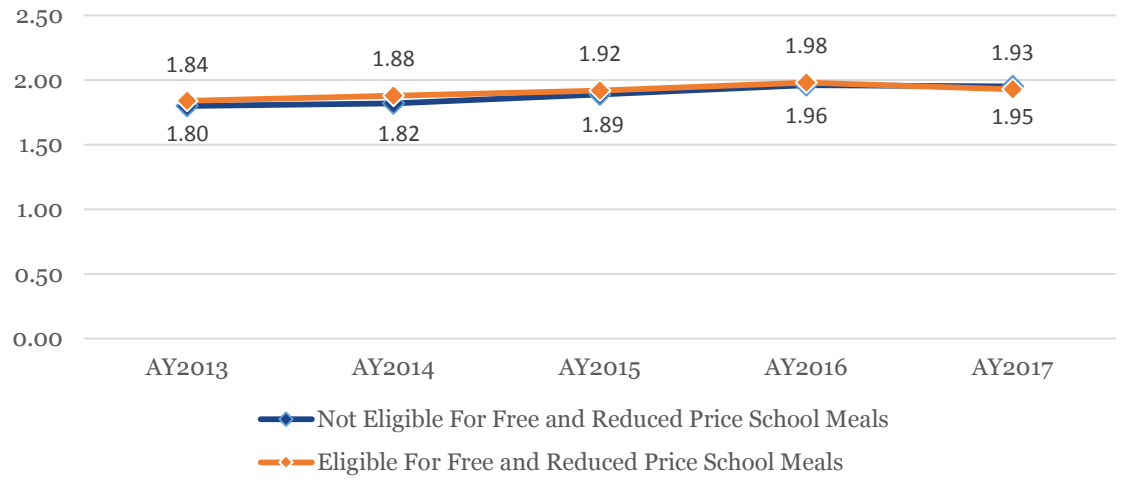
## FIGURE 4.7: COMPARISON OF AVERAGE CTE COURSES TAKEN BY MALE AND FEMALE STUDENTS




## FIGURE 4.8: COMPARISON OF AVERAGE CTE COURSES TAKEN BY WHITE AND MINORITY STUDENTS

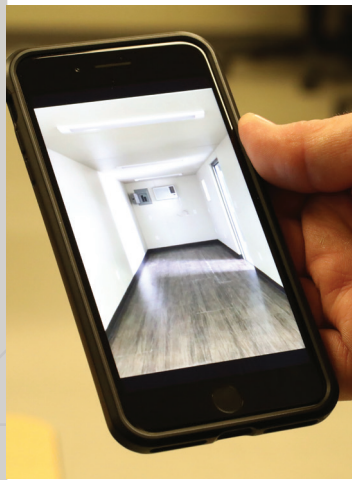



## FIGURE 4.9: COMPARISON OF AVERAGE CTE COURSES TAKEN BASED ON STUDENTS' ELIGIBILITY FOR FREE AND REDUCED PRICE SCHOOL MEALS




*Des Moines' Central Campus Cafe.*

*Hydroponics class at Chariton High School.*



*The interior of a tiny office built by students in the Architecture, Construction, and Engineering Academy at the Jones County Regional Center.*

## Chapter Highlights

From the results presented in this chapter, the following can be said:

- White students show a slight decline in secondary CTE participation over the five-year time period, while a slight corresponding rise exists for minority students. The difference in average CTE course taking is not great, only slightly higher for white students.
- Hispanic and African American students make up about 75 percent of overall minority secondary student CTE participation; CTE participation for different student population groups has remained more or less steady over the five-year time period.
- The same can be said of secondary student participation in CTE by gender, with overall participation by male students being higher than female students.
- The proportion of secondary CTE students who were eligible for free or reduced-price meals remained steady over the five-year period. It is noteworthy that the proportion of secondary CTE students who were eligible for free or reduced-price school meals, and those who were not, is not much different when it comes to average CTE course taking.
- The number of CTE courses a secondary student takes in a given academic year has not changed over the five-year period, with almost nine of 10 students taking at least three CTE courses.
- Over the five-year time period, there has been a steady rise in annual CTE course-taking in the 9th and 12th grades, but it is much more variable in 10th and 11th grades.

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# Chapter 5. Secondary CTE Human Resources

This chapter reports on those secondary teachers and community college faculty responsible for teaching secondary CTE students. The first part of this chapter summarizes data available regarding secondary CTE teachers employed by school districts. Information on K-12 staff is collected from Iowa's public school districts through the Licensed Staff Detail report on the Basic Educational Data Survey (BEDS) at the beginning of each school year. For the purpose of this report, the following information on CTE teachers for grades 9-12 from AY2013 to AY2017 was extracted from BEDS: race/ethnicity, gender, age, years of experience, base salaries, and type of employment.

In addition, this data was also matched with the data from the Iowa Board of Educational Examiners to cross-reference teaching endorsements. Both full- and part-time secondary CTE teachers are reported.

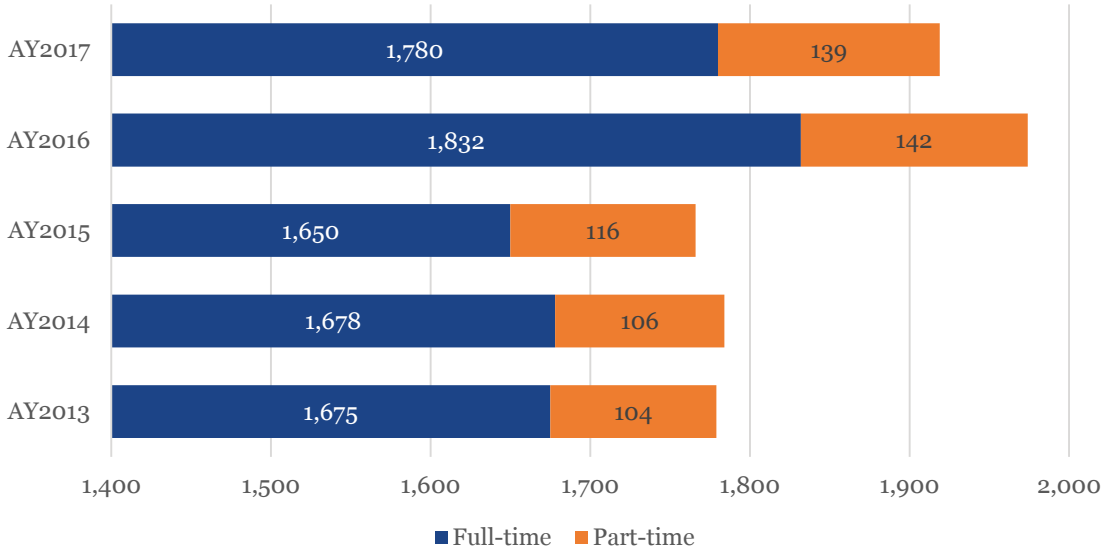
The second part of this chapter reports information of CTE faculty employed by Iowa's community colleges who teach college-credit contracted CTE courses for high school students. The Community College Management Information System (MIS) was used to report on this data. Community college faculty who had at least one high school student in their college-credit CTE classes in an academic year are identified as college-credit contracted CTE teachers in this report. These instructors may be full-time, adjunct, or part-time. For differentiating purposes, faculty employed by school districts are referred as secondary CTE teachers, and faculty employed by community colleges are referred as college-credit contracted CTE faculty in this chapter.

## Secondary CTE Teacher Characteristics

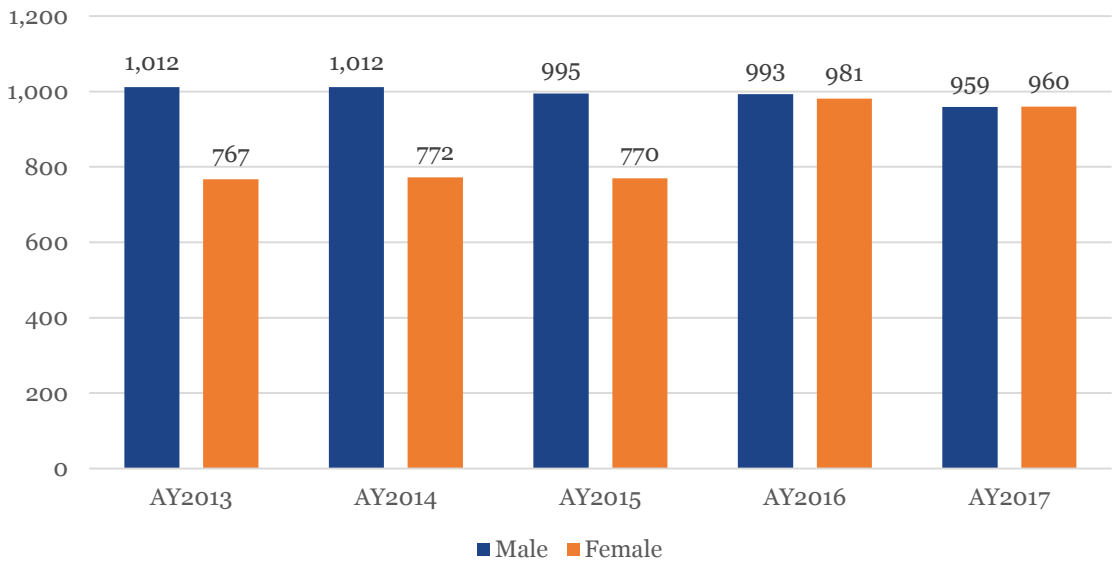
Figure 5.1 displays the number of full- and part-time CTE teachers employed by school districts since AY2013. The number of CTE teachers increased 7.9 percent from 1,779 in AY2013, to 1,919 in AY2017. Although the number of full-time CTE teachers increased from 1,675 to 1,780 (a 6.3 percent increase), the proportion of full-time CTE teachers decreased consistently over the past five years. In AY2017, 92.8 percent of CTE teachers were full-time, compared to 94.2 percent in AY2013.

In terms of gender, male CTE teachers have traditionally outnumbered females (Figure 5.2); however, in AY2017, females accounted for 50.0 percent of CTE teachers. The number of female CTE teachers increased 25.2 percent from AY2013 to AY2017, while the number of male CTE teachers dropped 5.2 percent.

## FIGURE 5.1: NUMBER OF SECONDARY CTE TEACHERS BY EMPLOYMENT TYPE (FULL-TIME VS. PART-TIME): AY2013-AY2017




## FIGURE 5.2: NUMBER OF CTE TEACHERS BY GENDER: AY2013-AY2017



As to race/ethnicity, the proportion of White and minority teachers stayed about the same, with minorities accounting for less than two percent of the CTE teacher population (Table 5.1). There is little variation regarding the average age, average district experience, and average total experience among secondary CTE teachers during the past five years (Table 5.2). The average base salary of CTE teachers (including part-time teachers) increased 10.1 percent from $48,264 in AY2013 to $54,229 in AY2017. For full-time CTE teachers, the average base salary increased 10.4 percent from $50,341 to $55,554. Adjusting for inflation, the increase is 4.32 percent over the five-year time period.

### TABLE 5.1: SECONDARY CTE TEACHERS BY RACE/ETHNICITY: AY2013-AY2017

| Race/Ethnicity | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Hispanic | 0.2 | 0.1 | 0.1 | 0.2 | 0.3 |
| Black | 0.8 | 0.8 | 0.6 | 0.7 | 0.6 |
| More than one | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Asian | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 |
| American Indian/ Alaskan Native | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| White | 98.4 | 98.7 | 98.8 | 98.7 | 98.9 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

### TABLE 5.2: AGE, BASE SALARY, TOTAL EXPERIENCE, AND DISTRICT EXPERIENCE OF SECONDARY CTE TEACHERS: AY2013-AY2017

| Year | Age (Years) | Base Salary | Total Experience (Years) | District Experience (Years) |
|---|---|---|---|---|
| AY2013 | 43.2 | $49,264 | 14.9 | 10.9 |
| AY2014 | 43.0 | $50,258 | 14.7 | 10.7 |
| AY2015 | 43.1 | $51,854 | 14.7 | 10.6 |
| AY2016 | 43.4 | $52,724 | 14.7 | 10.5 |
| AY2017 | 43.2 | $54,229 | 14.7 | 10.5 |

## Secondary CTE Teachers in the Six Service Areas

To teach secondary CTE courses, high school teachers are required to obtain relevant CTE endorsements (certificates) or authorizations. Each teacher can obtain multiple certificates. For reporting purposes, secondary CTE endorsements are categorized based on six service areas. Teachers with 5-12 Multi-occupations, 5-12 Work Experience Coordinator, PS Multi-Occupation Preparatory, or Vocation (9-12) endorsements can teach secondary courses applicable to all service areas (noted in Figure 5.3 as Applicable to All Service Areas).

As shown in Figure 5.3, in AY2017, teachers with endorsements in Business, Finance, Marketing, and Management (963) was the largest group; followed by Human Services (674); Applied Science Technology, Engineering, and Manufacturing (481); and Agriculture, Food, and Natural Resources (439). Few secondary CTE teachers have endorsements in Information Solutions (32) or in Health Sciences (23); while 126 teachers have endorsements applicable to all service areas.

**FIGURE 5.3: NUMBER OF SECONDARY CTE TEACHERS BY ENDORSEMENT TYPE IN AY2017**

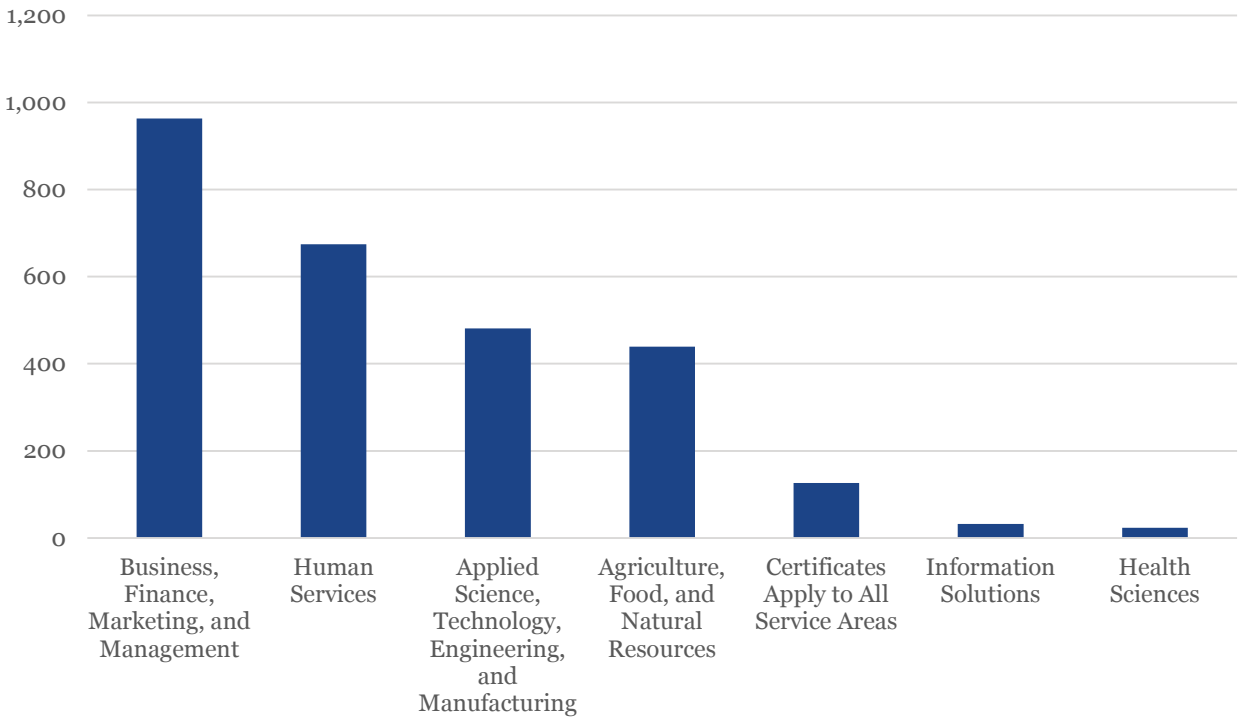


Figure 5.4 demonstrates the change in the number of endorsements in different service areas over the past five years. For the agriculture, food, and natural resources service area, there was a 1.6 percent increase in endorsements. The number of teachers with an endorsement in business, finance, marketing, and management dropped consistently from 1,097 in AY2013 to 963 in AY2017 (a 12.2 percent decrease). Similarly, applied science, technology, engineering, and manufacturing, and health science experienced decreases, 3.7 percent and 34.7 percent respectively. However, there was an 86.7 percent increase in human services, and 146.2 percent increase in information solutions.

As shown in Figure 5.5, the number of teachers with endorsements applicable to all service areas rose by 11.0 percent, although there was a decline from AY2016 to AY2017.

**FIGURE 5.4: NUMBER OF TEACHERS WITH CTE ENDORSEMENTS BY SERVICE AREA: AY2013-AY2017**

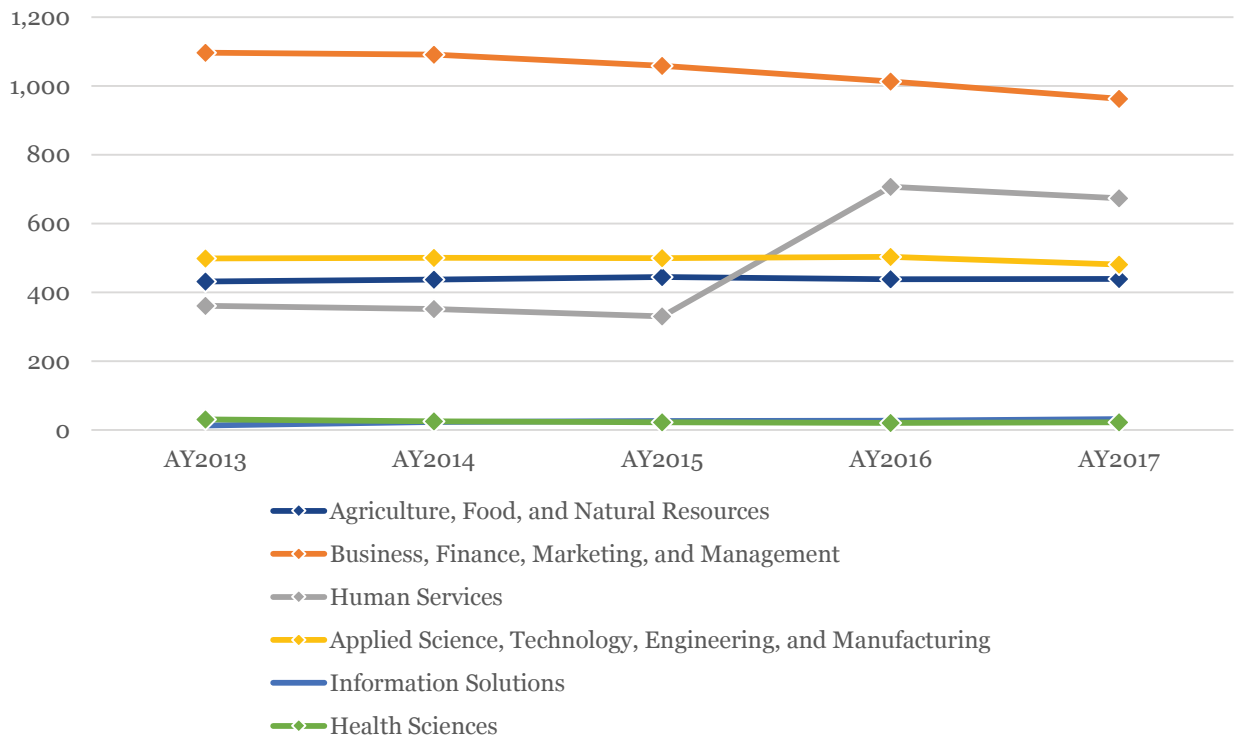


**FIGURE 5.5: NUMBER OF TEACHERS WITH AN ENDORSEMENT APPLICABLE TO ALL SERVICE AREAS: AY2013-AY2017**

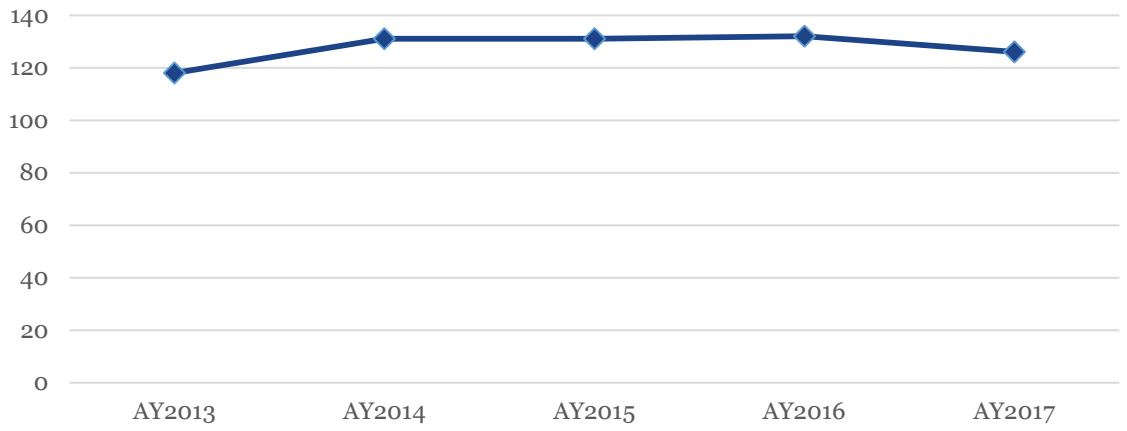
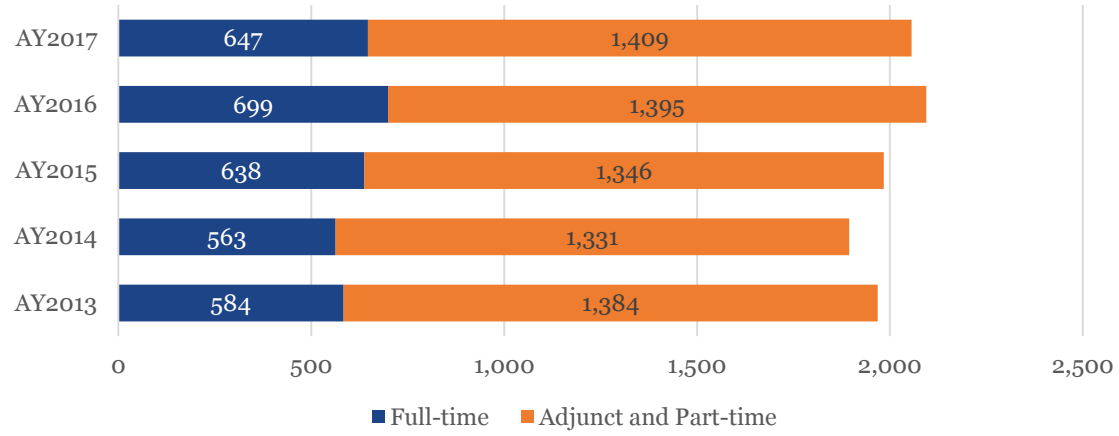



**FIGURE 5.6: NUMBER OF COLLEGE-CREDIT CONTRACTED CTE FACULTY BY EMPLOYMENT TYPE: AY2013-AY2017**

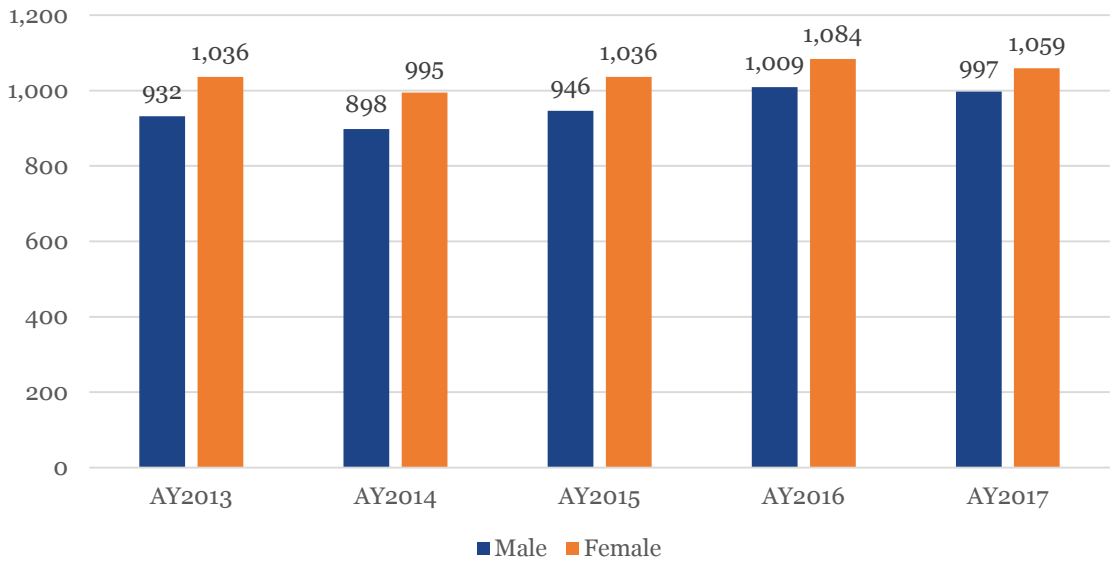



## Community College CTE Faculty Characteristics

Figure 5.6 displays the number of full-time, adjunct and part-time CTE faculty employed by community colleges and teaching college-credit contracted CTE courses since AY2013. The number of community college CTE faculty teaching high school students increased 4.5 percent from 1,968 in AY2013 to 2,056 in AY2017. Unlike secondary CTE teachers employed by school districts where they were mainly full-time, approximately 70 percent of community college CTE faculty teaching high school students were adjunct or part-time. Although the proportion of full-time community college CTE faculty was less than one third, the number of full-time CTE faculty increased by 10.8 percent from 584 in AY2013 to 647 in AY2017.

In terms of gender, females have outnumbered males (Figure 5.7). The number of female and male community college CTE faculty teaching high school students respectively increased 2.2 percent and 7.0 percent from AY2013 to AY2017. While approximately 3.0 percent did not report their race/ethnicity, White faculty were the largest group (approximately 94 percent) teaching college-credit contracted CTE courses (see Table 5.3). Although minorities accounted for only four percent, the proportion of minorities increased steadily during the past years. There is little variation regarding the average age (five-year average 48.6 years) of community college CTE faculty teaching high school students. The average salary of these CTE faculty (including part-time instructors) increased 20.2 percent from $24,322 in AY2013 to $29,236 in AY2017. Adjusting for inflation, the five-year growth in salary is a little over 12.6 percent.

### FIGURE 5.7: NUMBER OF COLLEGE-CREDIT CONTRACTED CTE FACULTY BY GENDER: AY2013-AY2017




### TABLE 5.3: COLLEGE-CREDIT CONTRACTED CTE FACULTY BY RACE/ETHNICITY: AY2013-AY2017

| Race/Ethnicity | AY2013 | AY2014 | AY2015 | AY2016 | AY2017 |
|---|---|---|---|---|---|
| | % | % | % | % | % |
| Hispanic | 1.4 | 1.2 | 0.9 | 1.2 | 1.4 |
| Black | 1.6 | 1.4 | 1.9 | 2.0 | 2.0 |
| More than one | 0.6 | 1.1 | 0.8 | 0.5 | 0.9 |
| Asian | 1.6 | 1.7 | 1.8 | 1.8 | 2.0 |
| American Indian/ Alaskan Native | 0.2 | 0.1 | 0.3 | 0.3 | 0.4 |
| White | 94.6 | 94.5 | 94.3 | 94.2 | 93.3 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

## College-Credit Contracted CTE Faculty in the Six Service Areas

Figure 5.8 displays the unduplicated number of community college CTE instructors teaching high school students by service area. Community college faculty who taught courses in more than one CTE service area are categorized under the heading "More than One," which was the largest community college faculty group teaching secondary students (888 instructors) in AY2017. The second largest community college CTE faculty group teaching high school students was Human Services (357), followed by Health Sciences (275). In contrast, only 51 CTE faculty taught courses solely in Agriculture, Food, and Natural Resources, indicating the school districts relied more heavily on the community colleges for CTE instruction in other service areas.

**FIGURE 5.8: COLLEGE-CREDIT CONTRACTED CTE FACULTY BY SERVICE AREA IN AY2017**

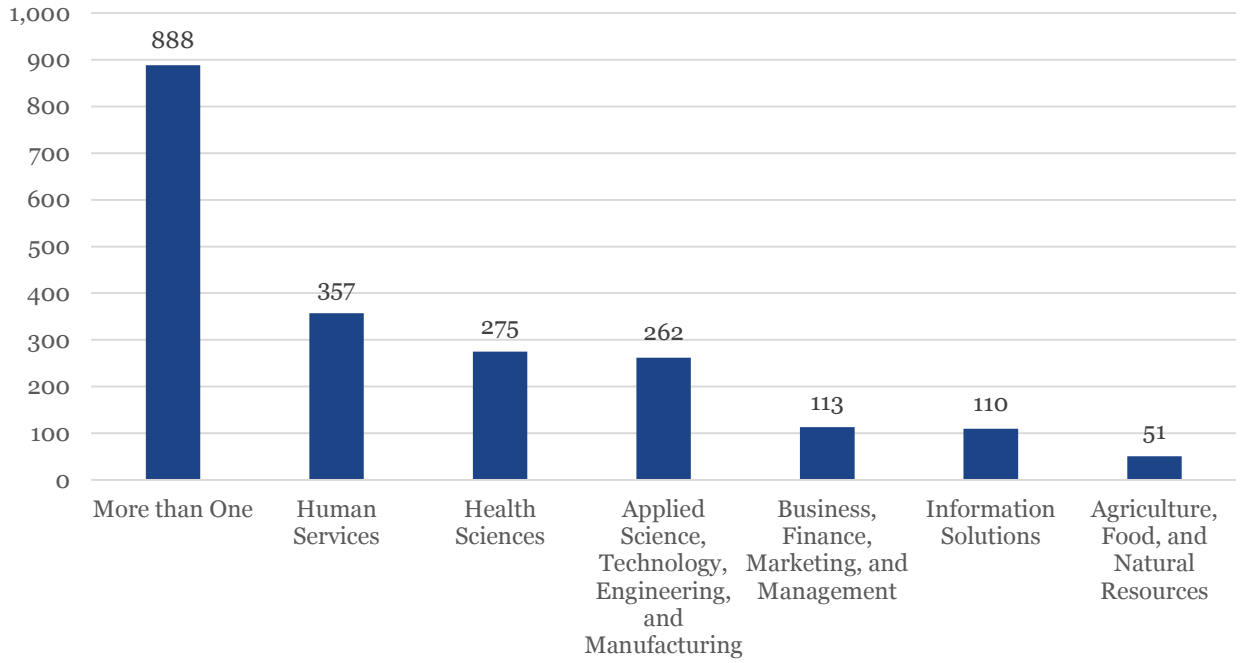
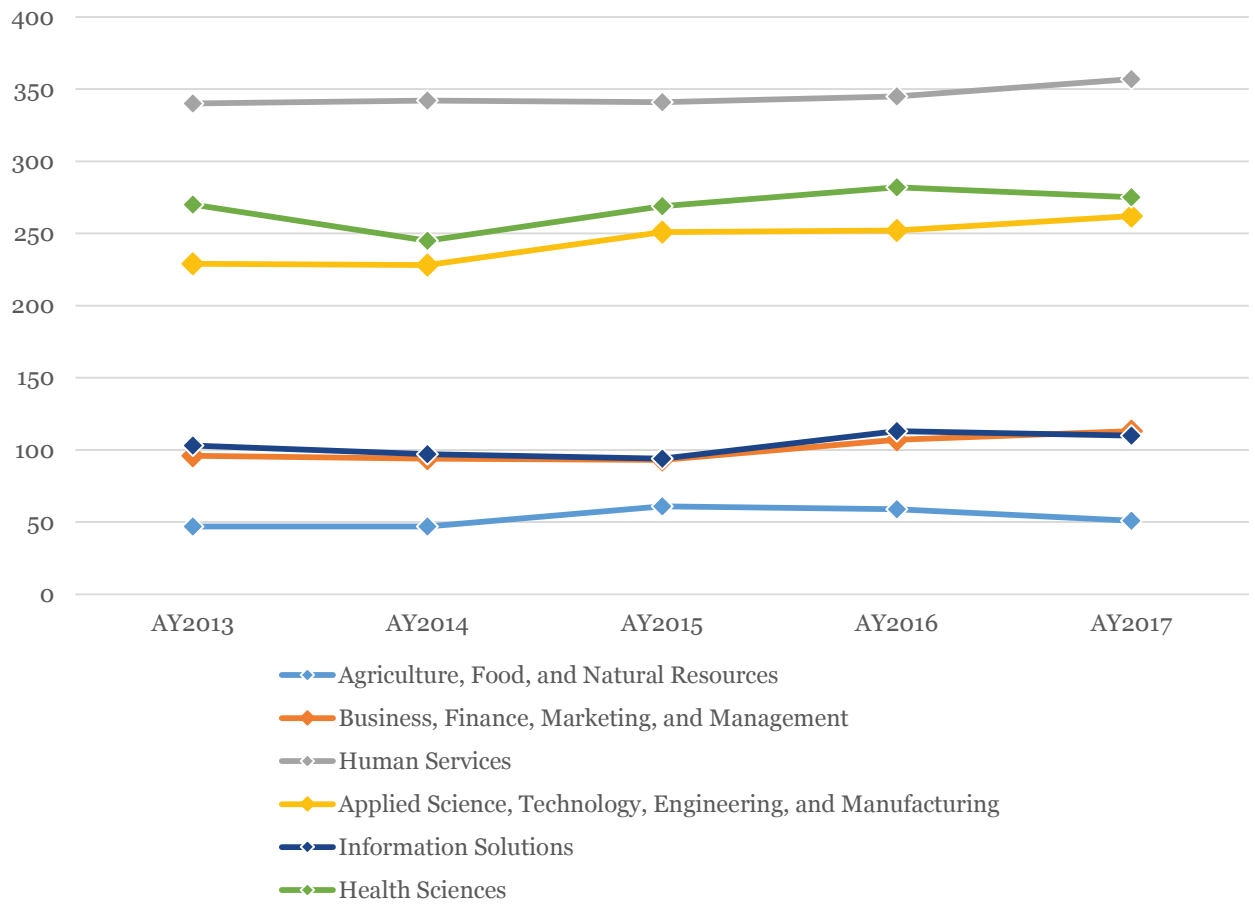


Figure 5.9 demonstrates the change in number of community college CTE faculty teaching secondary students in the six service areas over the past five years. For the agriculture, food, and natural resources service area, there was an 8.5 percent increase in the number of college-credit contracted CTE faculty. College-credit contracted CTE faculty in the business, finance, marketing, and management grew by 31.4 percent. There was a 5.0 percent increase in human services college-credit CTE faculty teaching high school students. The applied science, technology, engineering, and manufacturing service area saw the highest increase (14.4 percent).

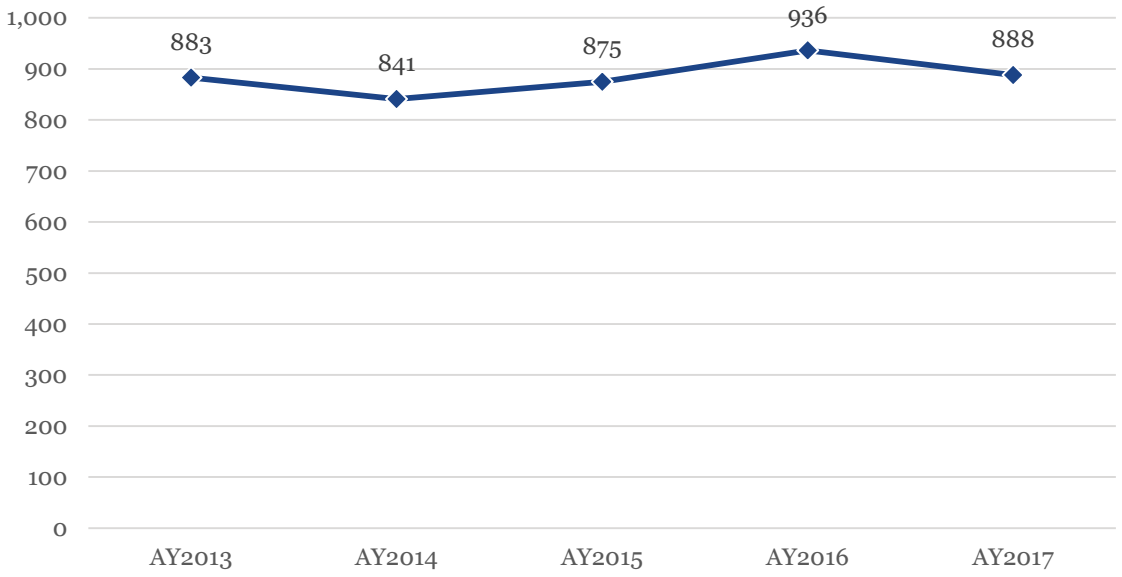
For the information solutions service area, the increase in community college CTE faculty was 6.8 percent. College-credit contracted CTE faculty in the health sciences service area increased numbers by 1.9 percent.

As shown in the figure below, the number of community college CTE faculty increased across all service areas where the faculty taught high school students exclusively in one service area. However, the numbers of community college CTE faculty teaching high school students in multiple service areas was largely unchanged (Figure 5.10).

**FIGURE 5.9: NUMBER OF COLLEGE-CREDIT CONTRACTED CTE FACULTY BY SERVICE AREA: AY2013-AY2017**



## FIGURE 5.10: NUMBER OF COLLEGE-CREDIT CONTRACTED CTE FACULTY IN MORE THAN ONE SERVICE AREA: AY2013-AY2017




*Keokuk County Career Academy welding and machine technology students.*

*An Alburnett High School culinary student plates a dessert.*

*Tools of the trade at Jones County Regional Center.*

## *Chapter Highlights*

From the results presented in this chapter the following can be said:

- Secondary CTE teacher characteristics have not changed over the five-year time period. The secondary CTE teacher is predominantly white, and is close to 50 years old.
- The service areas in which secondary CTE teachers have received the most CTE endorsements are more aligned to those service areas that were in place prior to the reconfiguration as a result of HF2392. As HF2392 reaches full implementation, there should be realignment as secondary CTE teachers focus more on the newer service areas or get endorsements in multiple areas.
- Over the five-year time period, secondary CTE teachers have seen their salary increase in real terms by over four percent.
- Community college CTE faculty teaching high school students generally tend to be female, white, working as part-time or adjunct faculty, are close to 50 years, and (adjusting for inflation) earn on average earns a little less than $27,500.
- Over the five-year time period, community college CTE faculty teaching high school students have seen their salary increase in real terms by over 12 percent.

# Section III:

## *Three Emerging Areas of Focus for Implementing High-Quality Career and Technical Education*

*Students from Creston High School display examples of communication and graphics services they provide to community businesses and organizations.*


*Students in Precision Agriculture at the Keokuk County Career Academy are challenged to apply their knowledge and abilities to take on real-world problems.*

# Chapter 6. Career and Technical Student Organizations

Career and technical student organizations (CTSOs) enhance career and leadership development of secondary and postsecondary students through contextual instruction, applied learning, and real world application. CTSOs are not "clubs," but rather integral components of the classroom curriculum and instruction. They include co-curricular activities that engage students in hands-on demonstrations and real life and/or work experiences related to a particular career interest. The national CTSO website (CTSOs.org) states the following: "As student organizations, CTSO's guide students in developing a career path (and) a program of study, and provide opportunities in gaining the skills and abilities needed to be successful in those careers through classroom/laboratory instructions, competitive events and other student organization activities. In addition, CTSOs offer students opportunities to hold leadership positions at the local, state, and national level and organize leadership development conferences, in which students can network with other students as well as business and industry partners."

## CTSOs in Iowa

Table 6.1 describes the participant outcomes, CTE program focus, and AY2017 membership for the secondary CTSOs supported by the Department through limited financial support through Carl D. Perkins funding. The Department holds the state charter for each CTSO established within the state and provides technical assistance as needed. Active secondary CTSOs in Iowa include:

- Business Professionals of America (BPA)
- DECA
- Family, Career, and Community Leaders of America (FCCLA)
- Future Business Leaders of America/Phi Beta Lambda (FBLA)
- National FFA Organization
- HOSA – Future Health Professionals
- Skills USA
- Technology Students Association (TSA)

Students participating in CTSOs develop and enhance leadership and citizenship skills within the context of career interests which also enhances their occupational skills and future employability. CTSOs also provide students with opportunities to participate in leadership initiatives and to enhance their awareness of the role of community service and responsibility to governmental affairs.

As described in Table 6.1, activities are designed to provide opportunities for student achievement in sound decision-making, positive professional appearances, and skill attainment through involvement of business, industry, and labor in a climate of positive interaction and cooperation. This is often the only leadership opportunity CTE students experience during their educational careers. Communities, states, and the nation benefit, as well as the individual and their families.

## TABLE 6.1: MEMBERSHIP FOR EACH CTSO AT THE SECONDARY LEVEL IN FY2017

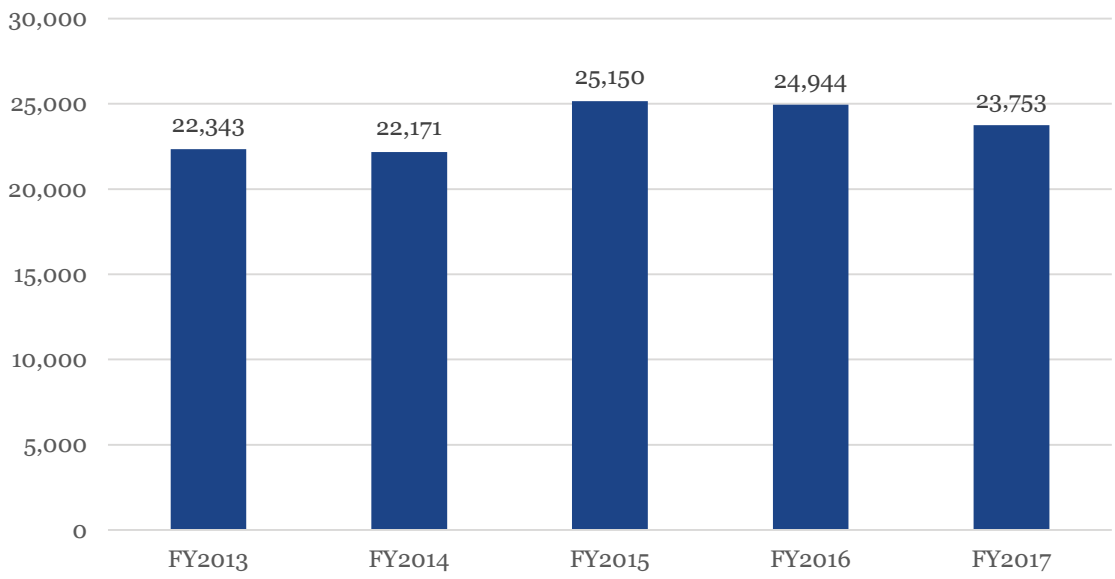
| Career and Technical Student Organizations | Participant Outcomes | CTE Programs | FY2017 Membership |
|---|---|---|---|
| | **FFA** develops students' leadership, promotes personal growth and career success, and encourages excellence in scholarship through agricultural education programs and services. | Agriculture, Food, and Natural Resources | 14,754 |
| | **Technology Student Association (TSA)** aims to enhance personal development, leadership, and career opportunities in STEM through intra-curricular activities, competitions, and related programs. | Manufacturing<br>Science, Technology, Engineering, and Mathematics | 4,267 |
| | **Family, Career and Community Leaders of America (FCCLA)** promotes personal growth and leadership development through family and consumer sciences education. Members develop skills for life through character development, creative and critical thinking, interpersonal communication, practical knowledge, and career preparation. | Education and Training<br>Hospitality and Tourism<br>Human Services | 1,577 |
| | **Future Business Leaders of America (FBLA)** brings business and education together in a positive working and career development programs which focus on leadership development, academic competitions, and community service. | Business, Management and Administration<br>Finance<br>Information Technology | 1,293 |
| | **DECA** prepares emerging leaders and entrepreneurs in marketing, finance, hospitality and management in high schools and colleges around the world. | Hospitality and Tourism<br>Marketing | 761 |
| | **Business Professionals of America (BPA)** contributes to the preparation of global professionals through the advancement of leadership, citizenship, academic, and technological skills. | Business, Management and Administration<br>Finance<br>Information Technology | 502 |
| | **HOSA – Future Health Professionals** promotes career opportunities in the health care industry and enhances the delivery of quality health care to all people. | Health Science | 378 |
| | **SkillsUSA** empowers its members to become world-class workers, leaders, and responsible American citizens. It improves the quality of our nation's future skilled workforce through personal, workplace, and technical skills grounded in academics. | Architecture/Construction<br>Arts, AV/Technology and Communications, Human Services, Law, Public Safety, Corrections and Security, Transportation, Distribution and Logistics | 221 |

## CTSO Membership in Iowa

CTSOs in Iowa currently serve over 20,000 students at the secondary level. Figure 6.1 displays the total number of CTSO members in the recent five fiscal years. The total number of CTSO members increased by 1,410 (6.3 percent) during the FY2013 to FY2017 period. Table 6.1 provides a brief description of each organization, corresponding CTE program, and the number of members at the secondary level in FY2017.

CTSOs are closely aligned to the six secondary CTE service areas in which Iowa students enroll in CTE courses (refer to figure 1.1). Participation in Iowa CTSOs has been more or less steady (between 20,000 and 30,000 annual members). FFA has the highest secondary membership in Iowa, however several other CTSOs also have substantial secondary membership. A few CTSOs in the state are not as large and have opportunities for secondary level membership growth.

**FIGURE 6.1: SECONDARY CTSO MEMBERSHIP IN IOWA: FY2013-FY2017**



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# Chapter 7. Secondary Career and Academic Planning

The career guidance section of HF 2392 (Division I) establishes revised career and academic planning requirements for secondary students in grades 8 through 12. The career planning requirements reflect a new vision for graduating Iowa high school students to be college and career ready. Career planning and redesign implementation began in AY2017. Career planning priorities have shifted the focus from a compliance driven reporting model to a holistic paradigm that includes:

- Choosing a career information and decision-making system (CIS) from a Department list (https://www.educateiowa.gov/pk-12/learner-supports/career-and-academic-planning), all of which meet the following state standards:
  1. Identification of basic metrics;
  2. Allowances for four-year plans; and
  3. Developmentally appropriate inventories to determine interests, abilities, values, personality traits, and other career relevant information about each student.
- A collaborative, school district team that includes CTE teachers;
- A district plan outlining who does what, how, when, and where; and,
- Inclusion of regional stakeholders including parents, economic development, workforce development, postsecondary partners, chambers, and community leaders.

The overarching goal of the re-visioning of career and academic planning in Iowa is to create within every school district an 8th grade individual career and academic plan (ICAP) and to monitor the progress of these ICAPs as the students move through grades 9 through 12.

## Implementation and Reporting Requirements

Implementation of career planning is reported annually on or before September 15 of the subsequent year. Assurances are reported via the Consolidated Accountability and Support Application (CASA). Completion data are reported via the Comprehensive School Improvement Plan (CSIP) reporting process.

Three hundred and thirty-three (333) public school districts operated in Iowa during AY 2017; of those districts:

- Thirty-nine (39) districts were involved in whole grade sharing agreements;
- Twenty-seven (27) districts did not have a high school within their district and provided the high school program through an agreement with another district;
- Three hundred and twenty (320) districts reported career-planning outcomes for students in grades 8 through 12; and,
- Thirteen (13) districts, all involved in tuition and/or whole grade sharing agreements with other school districts, appropriately reported no participation with career planning requirements.

Figure 7.1 displays the various CISs that school districts were using in AY2017. It should be noted that given that AY2017 was the first year of implementation, many school districts continued with the CIS that they were using prior to the enactment of HF 2392, Division 1. Furthermore, the MAP CIS is a free product and many school districts have shifted to using that system.

District teams are required to build relationships with the external stakeholders to: (a) identify community and regional labor market needs; and (b) provide CTE programming that fits the needs of students' and the community.

**FIGURE 7.1: CAREER INFORMATION SYSTEMS UTILIZED IN AY2017 BY PERCENT OF MARKET SHARE**

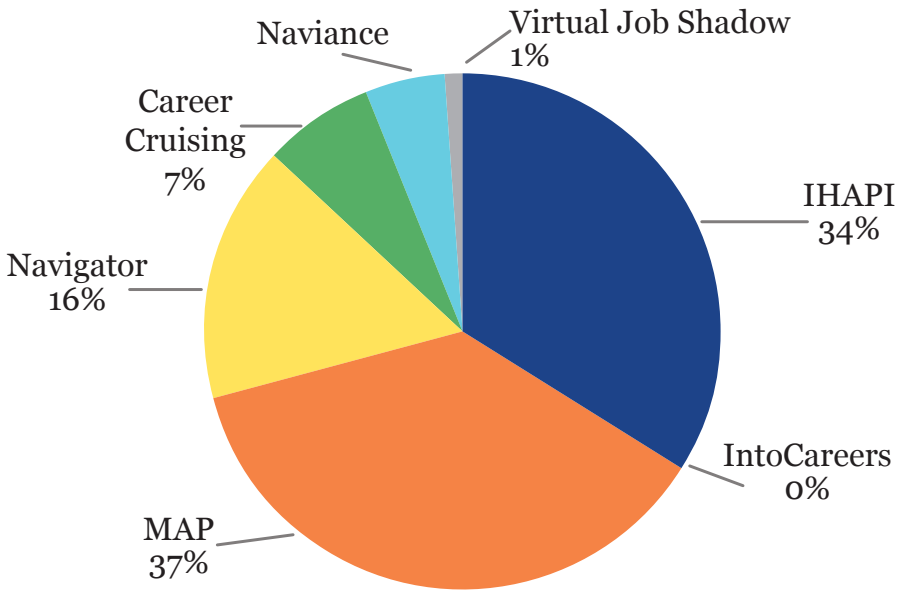
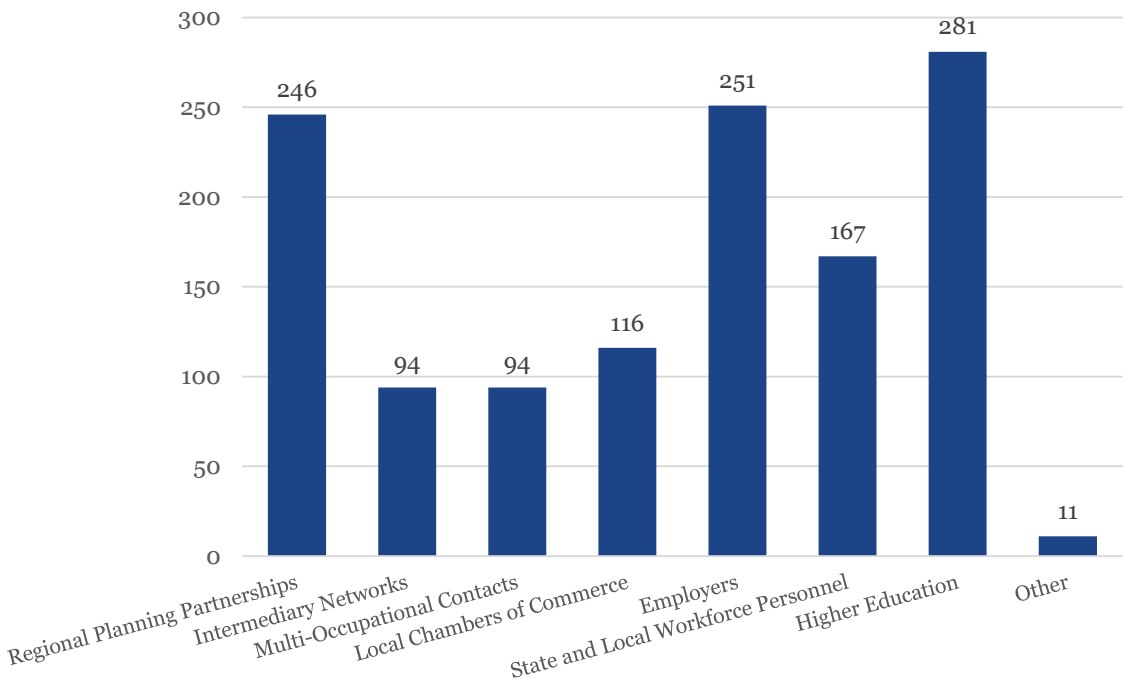


Figure 7.2 shows the different external stakeholders that are currently involved in district career and academic planning teams. Employers and higher education partners are involved within the greatest of number of school districts.

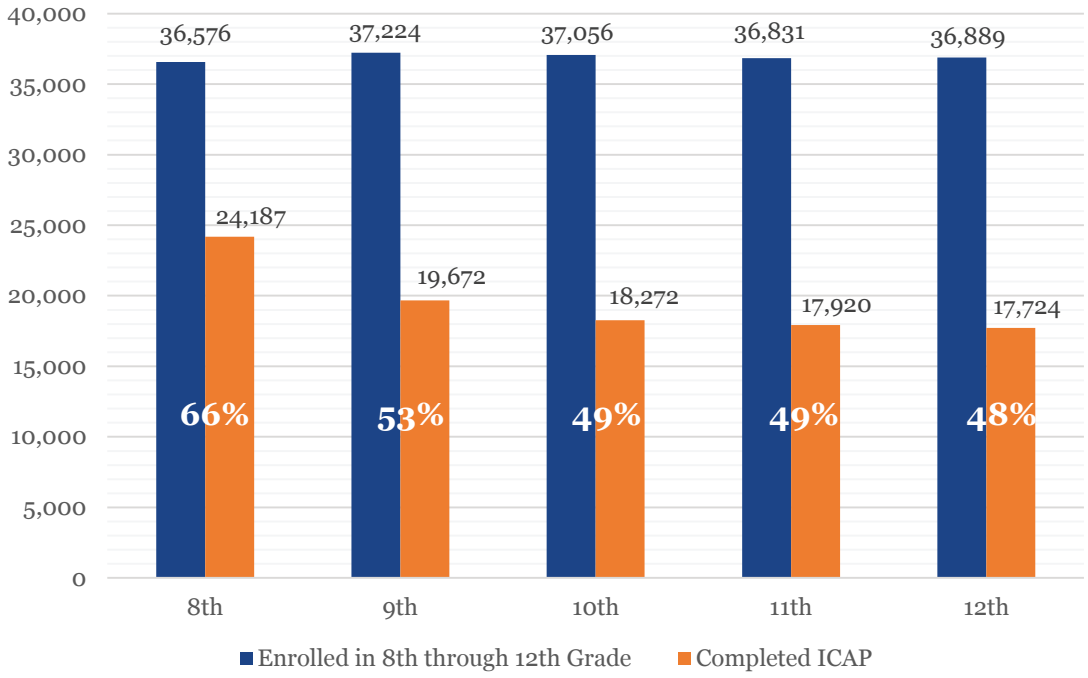
On or before September 30, 2017, all 333 school districts reported career planning outcomes related to the development and review of ICAPs. When both files were received, the Department reviewed the number of students enrolled in grades 8-12 as compared to the number of students completing the requirements for each district. Student mobility during the school year is a significant barrier to identifying the precise percentage of students enrolled and students completing ICAP requirements.

Though student level precision is not possible with the data sources available and collection method, the data provide a sense of how districts are implementing the new requirements. The Department reviews the outcomes and identifies both successful implementation strategies and the training gaps the state may need to address in future years.

**FIGURE 7.2: PARTICIPATION OF EXTERNAL STAKEHOLDERS ON DISTRICT TEAMS**



## FIGURE 7.3: NUMBER AND PERCENTAGE OF STUDENTS COMPLETING AN ICAP AS A PROPORTION OF TOTAL GRADE 8-12 ENROLLMENT AY2017



Districts are required to have students complete their ICAP using these five essential components of a quality career guidance system:

1. self-understanding;
2. career information;
3. career exploration;
4. postsecondary exploration; and
5. career and postsecondary decision.

These five essential components also form the foundation for the district plan for all students from grades 8 through 12. The districts use activities within each component to guide students and counselors as they build and/or revise the each student's ICAP. For a district to indicate completion, they must mark "yes" for all five essential components on the CSIP. If they mark "no" on any one of the five essential components, the district is marked down as not having met the requirements under division I of HF 2392.

Of the total eligible student population (185,076 students enrolled in grades 8 through 12), 97,775 students (53 percent) completed an ICAP that included all five of the required components. The remaining 47 percent of students completed an ICAP, however, their school districts had not yet incorporated all five of the required components. With the recent implementation of HF 2392, these districts continue to make progress toward ensuring all required activities are provided.

The essential career planning components are reviewed and updated annually for all students in grades 8 through 12. ICAPs are integrated into the counseling program. The data reflect that school districts focused implementation first on students in grades 11 and 12, and then with students in grades 8 through 10 respectively. Anecdotally, prioritizing the new requirements, beginning in grade 12 and then in grades 8 through 11, makes sense if districts want to have an impact on seniors needing post-high school direction and career and academic options in hand.

Implementation outcomes will increase as individual school districts work to create district plans that reflect each school's evolving career culture, and the dynamic nature of the district plan will illuminate areas within the district that require additional planning to effect positive outcomes.

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## Chapter 8. Regional Centers

The Secondary Career and Technical Education Task Force made the following recommendation: Through collaboration and regional partnerships, provide for increased and equitable access to high-quality CTE through a statewide system of regional centers.

Following up on the above recommendation, HF 2392 included language to have the CTE Regional Planning Partnerships (RPPs) focus on exploring the ways in which they would build, expand, and sustain regional centers. As established in HF 2392, regional centers must include at least four career academy programs and meet one of two participation requirements: 1) two school districts with a combined total of 120 participating students; or 2) a total of four school districts, with no minimum enrollment expectation. In essence, a regional center becomes a physical location where high school students may access numerous high-quality CTE programs.

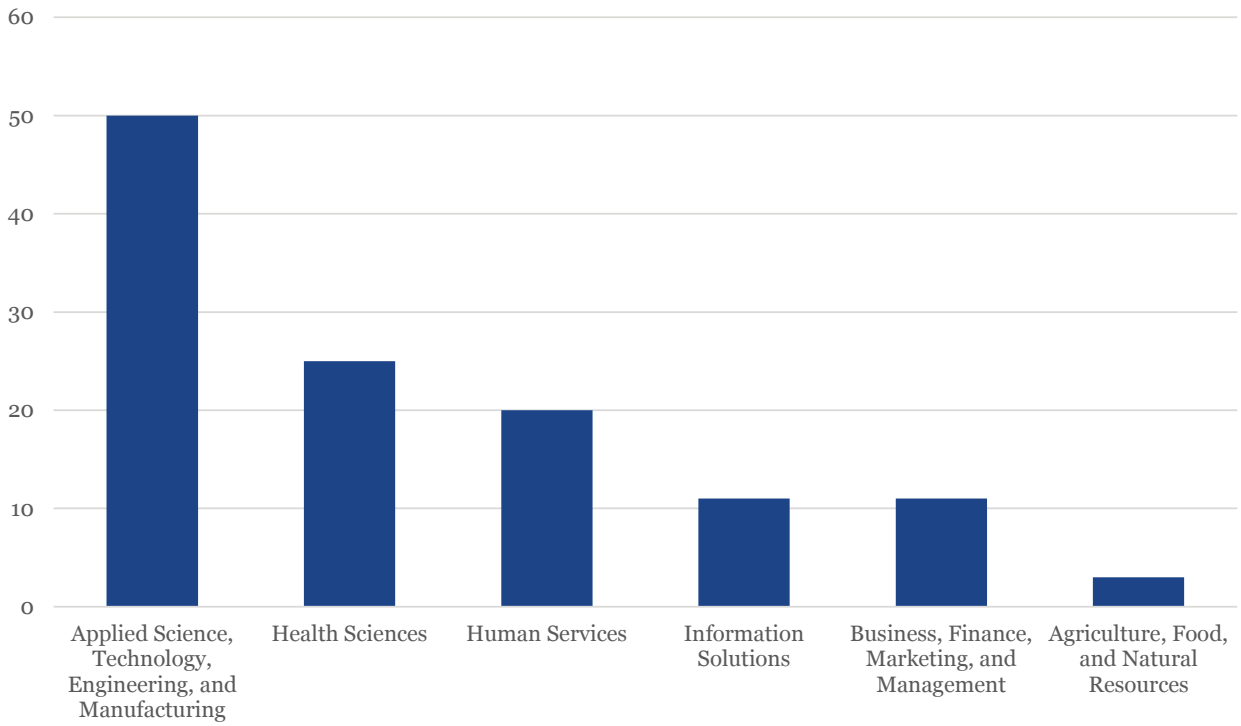
In Iowa, the regional center structure has its basis in the many partnerships that currently exist between school districts and community colleges when delivering high-quality CTE programs. These partnerships typically use the college-credit contracted course policy structure to put in place one or both of the above regional center conditions that are now in place within HF2392. It should be noted that not all such partnerships lead to the establishment of a regional center, but many have already done so.

To gauge the current state of how regional centers are distributed across Iowa, in the spring of 2018 a survey was administered by the Department to the 15 community colleges which gathered data regarding current regional center structure, the CTE programs offered within them, and the student enrollment. In AY2017, there were 15 regional centers providing 120 career academy programs to 2,137 high school students from 100 school districts.

In addition to regional centers, community colleges partner with school districts in different ways to offer career academy programs in various locations and through various methods. One such example is the Des Moines Public Schools' Central Campus, which offers nine career academy programs to students from 23 school districts.

Figure 8.1 displays a map of Iowa's current regional centers by RPP, which each mirror the 15 community college regions. Figure 8.2 shows the distribution of career academy programs by service area. Applied science, technology, engineering, and manufacturing was the largest service area with 50 career academy programs being offered, followed by health sciences (25), and human services (20). Agriculture, food and natural resources was the smallest service area with only three career academy programs being offered within a regional center. Table 8.1 provides more detail on each of the regional centers.

## FIGURE 8.2: DISTRIBUTION OF CAREER ACADEMY PROGRAMS BY SERVICE AREA IN AY2017



## TABLE 8.1. SUMMARY OF REGIONAL CENTERS IN FY2017

| RPP Region | Affiliation-Location | Number of K-12 Partners | Career Academy Programs Offered | Student Enrollment |
|---|---|---|---|---|
| 14 | SWCC-Creston* | 9 | Carpentry and Building Trades, Health Science, Electrical Technology, Automotive Repair Technology, Information Technology Systems Networking | 64 |
| 11 | DMACC-Ames | 13 | Building Trades, Auto Collision Repair, Auto Mechanics, Culinary Arts, Health Occupations, Education, Criminal Justice, Engineering, Business Communication, Health and Human Services<br>Bio-Science/Renewable Energy | 4,267 |
| | DMACC-Perry | 6 | Welding, Auto Mechanics, Criminal Justice, Business Administration, Health Occupations, Education | 1,577 |
| | DMACC-Ankeny* | 9 | Auto Mechanics, Auto Collision Repair, Diesel Mechanic, Culinary Arts, Criminal Justice, Business Administration, Emergency Medical Technician, Robotics, Computer Programming, Cyber Security, Graphic Design, Health Occupations | 1,293 |
| | DMACC-Southridge* | 9 | Auto Mechanics, Auto Collision Repair, Welding, Education, Criminal Justice, Business Administration, Health Occupations, Graphic Design | 761 |
| | DMACC-Newton | 5 | Building Trades, Welding, Auto Collision Repair, Business Administration, Culinary Arts, Health Occupations, Education, Criminal Justice | 502 |
| | DMACC-Carroll | 5 | Applied Engineering, Auto Mechanics, Building Trades, Business Administration, Health Occupations | 378 |
| 15 | IHCC-Ottumwa * | 6 | Welding, Agriculture, Computer Science, Electronic/ Robotics/Lasers | 27 |
| | IHCC-Sigourney | 4 | Precision Agriculture, Welding, Machine Teach, Health Sciences | 76 |
| 10 | KCC-Monticello | 8 | Advanced Manufacturing and Welding, Auto Tech, Graphics, Hotel Management, Information Technology, Patient Care, Project Lead the Way | 99 |
| | KCC-Hiawatha | 13 | Architecture, Construction and Engineering, Advanced Manufacturing, Auto Collision, Auto Tech, Business Exploration, Computer Software Development, Computer Software Development, Criminal Justice, Dental, Education, Electrical Mechanical Tech, Emergency Medical Technician, Patient Care, Pharmacy Tech, Pre-Allied Health, Pre-professional Health Careers, Pre-Social Work | 287 |
| | KCC-Washington | 6 | Architecture, Construction and Engineering, Advanced Manufacturing and Welding, Auto Collision, Auto Tech, Information Technology, Patient Care | 98 |
| | KCC-Coralville | 10 | ACE - Architecture, Construction and Engineering, Advanced Manufacturing, Auto Collision, Auto Tech, Business Exploration, Computer Software Development, Criminal Justice, Education, Electrical Mechanical Tech, Emergency Medical Technician, Patient Care, Pharmacy Tech, Pre-professional Health Careers, Pre-Social Work | 199 |

| RPP Region | Affiliation-Location | Number of K-12 Partners | Career Academy Programs Offered | Student Enrollment |
|---|---|---|---|---|
| 9 | EICC-Scott* | 4 | Transportation, Education, Allied Health, Engineering, Advanced Manufacturing | 116 |
| 5 | ICCC-Eagle Grove | 5 | Bio-process Technology, Business, Engineering Technology, Manufacturing Technology, Teacher Academy | 114 |

**Indicates community college main campus*

The information presented in this chapter leads to the following: Regional centers are clustered around the major metropolitan areas in Iowa, which typically have the larger school districts and the higher high school populations to make the regional center viable. Two, regional centers are also established where school district sizes are small and located in the rural parts of Iowa. Three, there are many regions of Iowa where regional centers have not as yet been established. With the implementation of HF2392 beginning to take a foothold across Iowa, the expectation is that the RPPs, through their strategic planning, will begin to explore the viability of regional centers in offering expanded options for students and ensuring equitable access to a variety of high-quality CTE programs which also meet the needs of the regional workforce.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