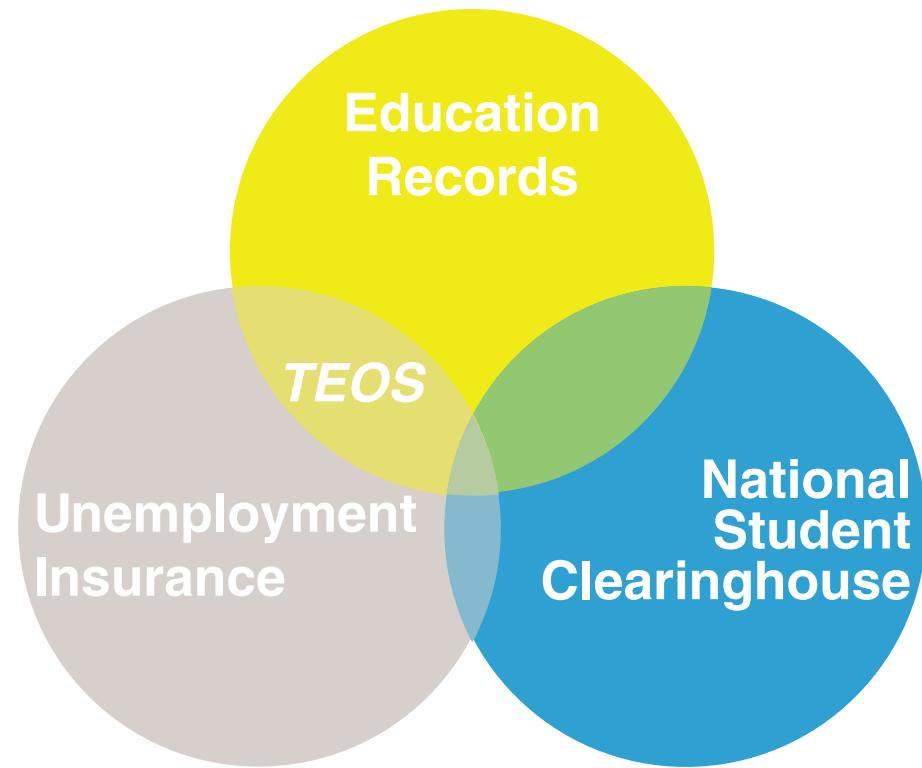


Visualizing Transitions into the Workforce

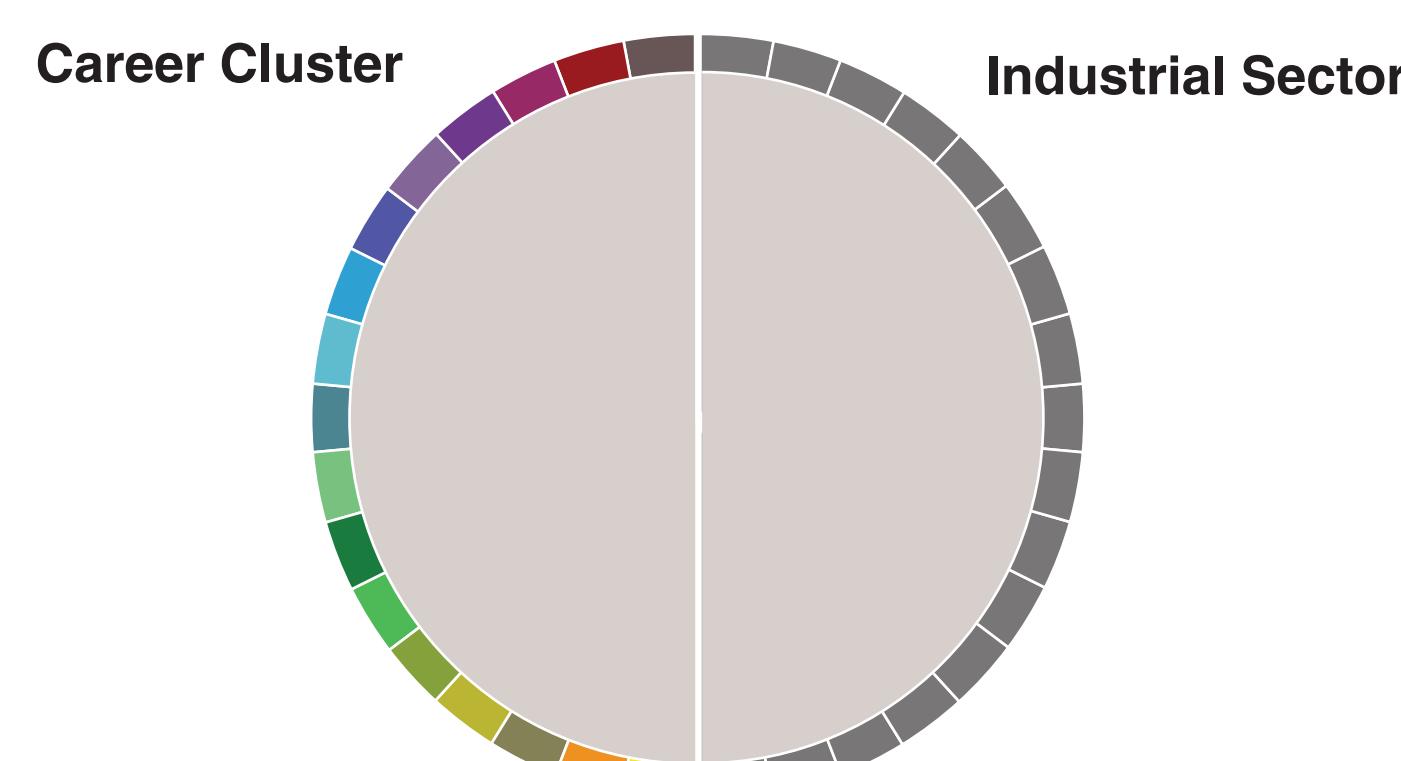
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Several studies use administrative educational and unemployment insurance (UI) records to report average wages [2,7]. The State of Iowa also uses UI records to track students from majors in community colleges to industry of employment. The Iowa Department of Education (IDE) and Iowa Workforce Development (IWD) collaborated to form the Training and Employment Outcomes System (TEOS) by joining education and



UI records. First, IDE included a cohort of students who either left after the 2004-05 academic year or completed a degree in the 2005-06 academic year. IDE matches the records with the National Student Clearinghouse to remove any student found at another postsecondary institution. Those students are then matched with IWD's UI records. Wages and employment are aggregated by year and then returned to IDE to be merged with the education data. The resulting dataset, TEOS, is then used by both departments.

We use *Circos*, a program designed to show related genomes across various species [3,5], to illustrate the movement from career clusters to industries. The left portion of the center diagram shows the



sixteen career clusters and the transfer-oriented college parallel programs [8]. The right shows the industry of primary employment three years after graduation. Industries are aggregated to the two-digit industry code set by the North American Industry Classification System (NAICS).

We presume the highest paying wage is the principal employment for each student.

There are several notable relationships between major and eventual industry of employment. College parallel majors who did not transfer comprised the majority of the TEOS dataset, nearly 3,000 students. Subsequently, college parallel majors were the largest source of employment in almost every industry.

Health majors almost universally transitioned into jobs within the health industry. Although these occupations may not be aligned with their major, this indicates success within the program. Besides health majors, college parallel students were the second largest source of labor 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.

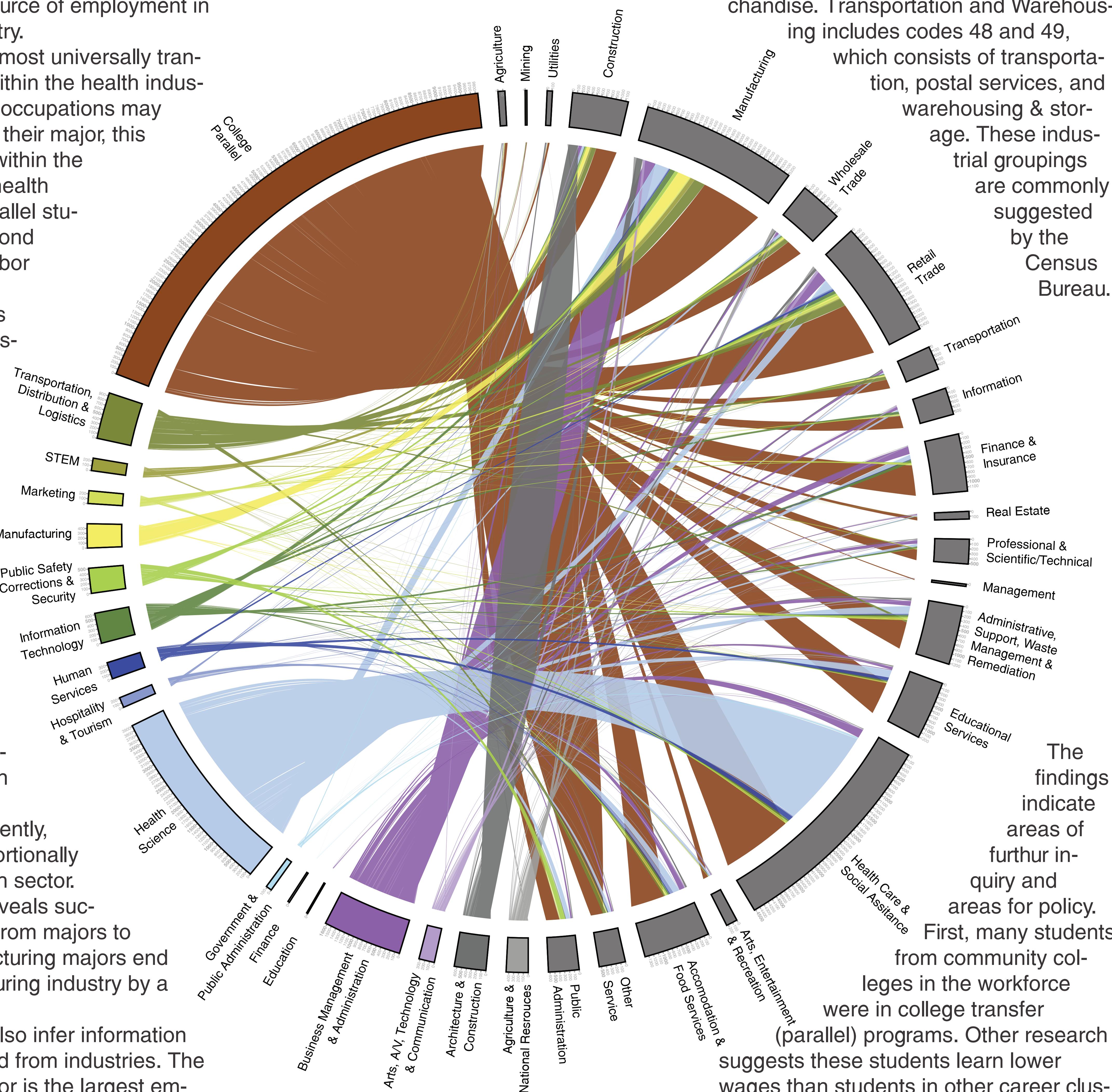
The data also reveals particular, but expected, aspects of each program. For instance, information technology (IT) is utilized in every sector of the economy. Subsequently, IT majors are proportionally represented in each sector.

The data also reveals successful transitions from majors to industries. Manufacturing majors end up in the manufacturing industry by a large margin.

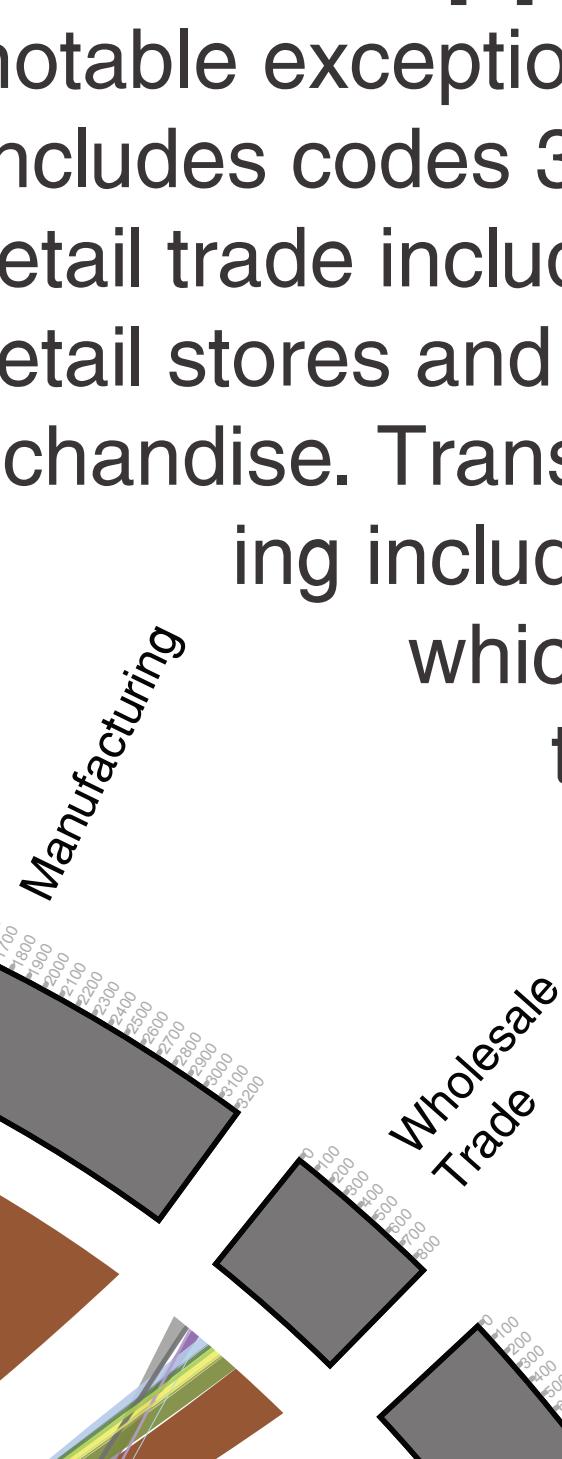
Finally, we can also infer information about labor demand from industries. The manufacturing sector is the largest employer of Iowa community college leavers and graduates. Those employers hire a substantial number of college parallel program participants. The health care and administration sector is also a large employer, mostly hiring health science and college parallel majors.

More information:

Iowa Community College's Role in Workforce Development. 2009.



Industries are aggregated to the two-digit NAICS code [9]. There are a couple of notable exceptions. First, manufacturing includes codes 31, 32, and 33. Second, retail trade includes codes 44 and 45—retail stores and mail-order & used merchandise. Transportation and Warehousing includes codes 48 and 49, which consists of transportation, postal services, and warehousing & storage. These industrial groupings are commonly suggested by the Census Bureau.



The treemap visualization illustrates the aggregation of industries into broader groups based on NAICS codes. The largest group is Manufacturing, which covers codes 3100 through 3200. The Wholesale Trade group covers codes 4200 through 4900. The Retail Trade group covers codes 4400 through 4500. Other smaller groups include Transportation, Postal Services, and Warehousing (codes 4800 and 4900), and Professional, Scientific, Technical, Management, Administrative, and Waste Management Services (various codes from 5000 to 5900).

Manufacturing Subsectors

Food & Textile **Wood & Nonmetal** **Metal & Electronic**

Subsector	Value
Food & Textile	100
Food & Textile	200
Food & Textile	300
Food & Textile	400
Food & Textile	500
Food & Textile	600
Food & Textile	700
Food & Textile	800
Food & Textile	900
Food & Textile	1000
Food & Textile	1100
Food & Textile	1200
Food & Textile	1300
Food & Textile	1400
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Food & Textile	2500
Food & Textile	2600
Food & Textile	2700
Food & Textile	2800
Food & Textile	2900
Food & Textile	3000
Food & Textile	3100
Food & Textile	3200
Wood & Nonmetal	100
Wood & Nonmetal	200
Wood & Nonmetal	300
Wood & Nonmetal	400
Wood & Nonmetal	500
Wood & Nonmetal	600
Wood & Nonmetal	700
Wood & Nonmetal	800
Wood & Nonmetal	900
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Wood & Nonmetal	2600
Wood & Nonmetal	2700
Wood & Nonmetal	2800
Wood & Nonmetal	2900
Wood & Nonmetal	3000
Wood & Nonmetal	3100
Wood & Nonmetal	3200
Metal & Electronic	100
Metal & Electronic	200
Metal & Electronic	300
Metal & Electronic	400
Metal & Electronic	500
Metal & Electronic	600
Metal & Electronic	700
Metal & Electronic	800
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Metal & Electronic	2600
Metal & Electronic	2700
Metal & Electronic	2800
Metal & Electronic	2900
Metal & Electronic	3000
Metal & Electronic	3100
Metal & Electronic	3200

Manufacturing employs a large number of community college students from a diverse range of career clusters. Manufacturing is also the largest industry in Iowa. Twenty-one percent of Iowa's GDP is manufacturing output.

The sector itself is comprised of three types of manufacturing: food & textile; wood and non-metal; and metal & electronic manufacturing. The diagram above breaks-down transitions into each manufacturing subsector.

Metal & electronic manufacturing was the largest subsector of employment with manufacturing, employing 1,716 students. Combined, food & textile and wood & nonmetal manufacturing employed 1,512 students.

Manufacturing students were typically located in metal & electronic manufacturing subsector. Almost 70 percent of manufacturing students within the manufacturing sector were employed there.

CareerA ClusterSimpler TransitionsView

