Iowa's Skilled Worker Pipeline

Iowa Community Colleges

Community Colleges

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Foreword

Dear Community College Colleagues,

Iowa faces challenges and opportunities in ensuring the competitiveness of its workforce. The global economy is increasingly driven by knowledge and innovation, requiring a workforce with greater skills than in the past. Technological change and globalization have eliminated many traditional pathways to the middle class for diligent low-skill Iowans. At the same time, the demand for middle skill workers is growing and expected to outstrip supply — leaving essential positions vacant and hampering economic growth.

Closing the skills gap and sharpening the state's competitive edge requires a better educated and credentialed workforce. Iowa community colleges are uniquely positioned to address this challenge; striving to meet the needs of their laborsheds and prepare their students for rewarding careers.

Data can be a powerful tool in helping community colleges align offerings with occupational demand and address structural mismatches. This report is an effort to provide an overview of the alignment of credential production and projected occupational demand and encourage leaders to further explore potential mismatches and opportunities for improved alignment. It is one of several new department products intended to help regional decision-makers make informed decisions about which programs to offer, assess program effectiveness, and demonstrate the value of investments in workforce preparation.

Brad A. Buck
Director
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Introduction

There have been a multitude of studies which attempt to pinpoint the root causes of the gap between the supply and demand for middle-skilled workers. Some claim there is simply a shortage of people available for work, while others assert the majority of job applicants lack the appropriate skills needed to perform the required duties of vacant positions. In response to this debate, Iowa Workforce Development published a report titled "Middle-Skill Jobs in Iowa" which concludes that the problem is not that Iowa doesn't have an adequate number of people to fill vacant positions, but rather that the pool of available workers do not have the necessary skills to perform in those positions. Compounding the problem is the demand for middle-skilled jobs, those jobs which require some education or training beyond high school but less than a four-year degree. The demand for these jobs outpace those that require low or high skills. Taken together, businesses within "in-demand" industries across the state are finding it difficult to fill vacant positions.

The following analysis produced within the Division of Community Colleges; Iowa Department of Education Division, provides policy-makers, educators, and students with tangible results illustrating the number of issued community college credit awards by occupational category, and how those awards relate to current and future in-demand occupations throughout the state of Iowa. Specifically, the analysis attempts to answer the following questions:

- To what extent are community colleges able to meet the future employment demand in Iowa?
- How well are community colleges adapting the pipeline to meet future employment demand for middle-skill occupations?

To answer these and other questions, the division conducted an analysis which links the 2013 supply of community college awards to the current and future occupational demand in Iowa.

Data

For this analysis, all occupations were explored in order to identify only those that link to a community college credit program (certificate, diploma, or associate degree). If the link from training to employment was identified, the occupation was included in the analysis. All liberal arts and multi-disciplinary awards were excluded due to the lack of a job-specific relationship.

Labor supply and demand data was analyzed in order to determine the impact community colleges have on Iowa's skilled worker pipeline, By utilizing graduate data from the community college for the supply, and Iowa's 2012 to 2022 Long-Term Occupational Projections for the demand, occupation-specific data was analyzed. These data by occupation include:

- Type of award (credit only)
- Program of study
- Projected job openings (both replacement and new)
- Wages
- Education
- Training
- Experience
- Skills
- Projected job growth (by percentage)

The occupations were then aggregated into occupational categories for analysis, where necessary. Those occupations that do not directly correlate to training or education at the community college were excluded.

The primary source for the supply of community college awards was obtained from data housed within the Management Information System (MIS) at the Iowa Department of Education. For each Iowa community college, the 2012-2013 community college graduates were extracted by educational program as defined by the classification of instructional programs (CIP). Using the academic year 2012-2013 academic year, the award total for each six-digit CIP was obtained.

Occupational projections were used as the primary source for the demand representation. These estimates of the expected demand for individual occupations and are based on annual average employment levels by industry for the starting point and target years. The occupational employment projections are built primarily on three sets of data:

1) industry employment projections;
2) an annual occupational survey of employers, and;
3) national change factors (data used to identify economic changes not captured in the first two sets of data).

Some occupations will not show up on the list of projections because they either reflect a small sample and are incorporated into similar job titles or cannot be listed due to confidentiality reasons.

Methods

Future occupational demand was defined using the annual growth rate of Long-Term (2012-2022) Iowa Occupational Projections as produced by Iowa Workforce Development. These projections use the standard occupational classification (SOC) system and can be categorized at different levels (two-, three-, five-, and six-digit), where moving from a lower to higher level indicates more disaggregation in the occupational structure (i.e., Management Occupations (2-digit) to Construction Management (6-digit)).

The objective of the analysis was to determine occupational demand and ascertain the strides that Iowa community colleges have made to meet this demand. To do so requires linking occupations (SOC codes) to education programs (CIP codes). For this a crosswalk is required linking the two, such as the one available from the National Crosswalk Center®. Additionally, the National Career Clusters® Framework links every CIP code to one of the 16 career clusters, though such an assignment was not done for SOC codes. To fill this gap, the National Research Center for Career and Technical Education (NRCCTE), began by assigning one of the 79 career pathways (where each pathway was associated to a unique career cluster) to each of the SOC Codes, thereby linking a SOC code to a specific career cluster. Since the CIP-cluster assignment was done separately from the SOC-pathway-cluster assignment, discrepancy between the two sets of assignments are likely. How this might impact the CIP-SOC linkage needs to be taken into consideration.

Several additional pieces of information required consideration in order to link occupations to education programs more precisely:

1) Identifying which CIP-SOC linkage has the same cluster assignment.
2) There are many instances when the CIP-SOC linkages are not one-to-one. In those instances, the CIP-SOC linkage chosen showed the greatest precision i.e., the education and training a graduate receives permits direct entry into the occupation (SOC) with which the education program (CIP) is linked.
3) There were occupations for which the minimum education requirement for entry was either a high school degree or a bachelor's degree. However, Iowa community colleges offer education programs that lead into these occupations, and these occupations were included in the crosswalk after reviewing information about work experience and on-the-job training requirements.
4) There are occupations that were listed as "all other", these were excluded from the crosswalk.

Taking these additional pieces of information into consideration, the crosswalk linking SOC codes to CIP codes at the six-digit level was developed. For brevity, this crosswalk is called Iowa Pipeline Occupation to Education Crosswalk (IPOEC).

With IPOEC in hand, the total number of 2012-2013 awards associated with each pipeline occupation (two-digit) category was obtained. For each of the occupational categories, the corresponding projected employment demand was obtained. Levels for determining high/low wage and demand are based on an average Iowa occupational growth rate for all occupations of 1.3 percent and on the 2013 Iowa average annual salary of $40,240. The state average occupational growth rate and the average annual salary of $40,240 are illustrated as intersecting vertical and horizontal lines, respectively, creating four separate quadrants:

- High Demand/High Wage (>1.3%; >$40,240)
- High Demand/Low Wage; (>1.3%; <$40,240)
- Low Demand/High Wage;(<1.3%;>$40,240)
- Low Demand/Low Wage. (<1.3%; <$40,240)

(Continued on back page)

Community College Credit Awards

The majority of credit awards in 2013 were concentrated on programs related to healthcare, installation and maintenance, business support, management, and production. These programs are consistent with high demand occupations across the state. Not all of Iowa's community colleges offer the same programs or have the same demand, therefore, each are analyzed separately in the following pages.

Table 1 below illustrates the concentration of Iowa's community college credit awards in 2013 , the rate of projected annual growth, average annual salary, average entry level salary, and annual projected number of jobs for each occupational category.

The figures on page 7 illustrate visually the alignment between community college credit awards and middle-skill occupational demand. The size of the bubbles represent the number of either credit awards (Figure 1) or annual projected job openings (Figure 2) by occupational category. The location of the bubble on the grid correlates to the average annual salary and growth rate for each occupational category. Each figure is split into four sections representing high demand/high wage, low demand/high wage, low demand/ low wage, and high demand/low wage.

Table 1. Growth Rate, Salary, 2013 Community College Awards, & Projected Job Openings by Occupational Category

Occupational Category	Annual Average Growth Rate	Average Annual Salary	Average Entry Salary	2013 Awards	Annual Projected Job Openings
Transportation & Material Moving Occupations	1.2%	$ 35,939	$ 24,051	153	2,645
Office & Administrative Support Occupations	0.9%	$ 36,068	$ 25,744	792	2,410
Construction & Extraction Occupations	2.3%	$ 40,465	$ 28,310	174	2,315
Healthcare Practitioners & Technical Occupations	2.3%	$ 42,986	$ 33,436	3,112	2,305
Installation, Maintenance, & Repair Occupations	1.3%	$ 42,167	$ 29,228	1,097	2,165
Production Occupations	0.7%	$ 34,735	$ 25,184	696	2,000
Personal Care & Service Occupations	2.0%	$ 24,767	$ 18,107	344	1,765
Healthcare Support Occupations	2.3%	$ 32,767	$ 24,760	834	1,745
Sales & Related Occupations	1.1%	$ 51,743	$ 27,939	31	1,135
Computer & Mathematical Occupations	2.0%	$ 69,406	$ 37,497	461	1,130
Business & Financial Operations Occupations	1.6%	$ 52,461	$ 31,700	481	1,060
Education, Training, & Library Occupations	1.0%	$ 25,527	$ 17,955	34	770
Management Occupations	1.4%	$ 87,030	$ 54,535	836	555
Community & Social Services Occupations	2.1%	$ 36,589	$ 23,777	80	475
Food Preparation & Serving-Related Occupations	1.2%	$ 33,238	$ 21,605	148	385
Protective Service Occupations	0.6%	$ 51,149	$ 34,843	251	350
Arts, Design, Entertainment, Sports, & Media Occupations	1.3%	$ 36,188	$ 23,151	253	295
Life, Physical, & Social Science Occupations	1.2%	$ 39,981	$ 27,678	77	175
Legal Occupations	1.4%	$ 39,755	$ 27,265	56	70
Farming, Fishing, & Forestry Occupations	0.4%	$ 42,355	$ 28,658	46	50
Architecture & Engineering Occupations	0.3%	$ 51,523	$ 38,391	281	45
Building & Grounds Cleaning & Maintenance Occupations	1.5%	$ 42,083	$ 28,194	73	40
Totals & Averages	1.4%	$ 43,133	$ 28,728	10,310	23,885

*All numbers in this chart are associated with community college realated training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

Figure 1. Iowa's Community College 2013 Credit Awards by Occupational Category

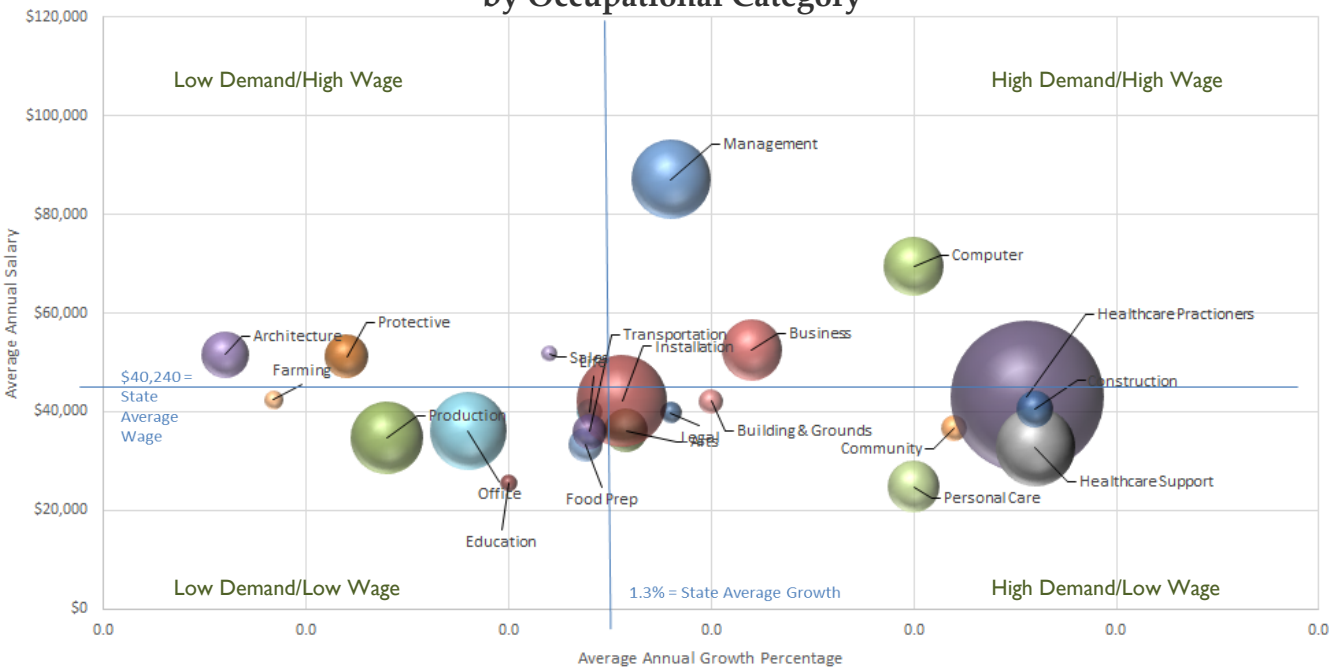
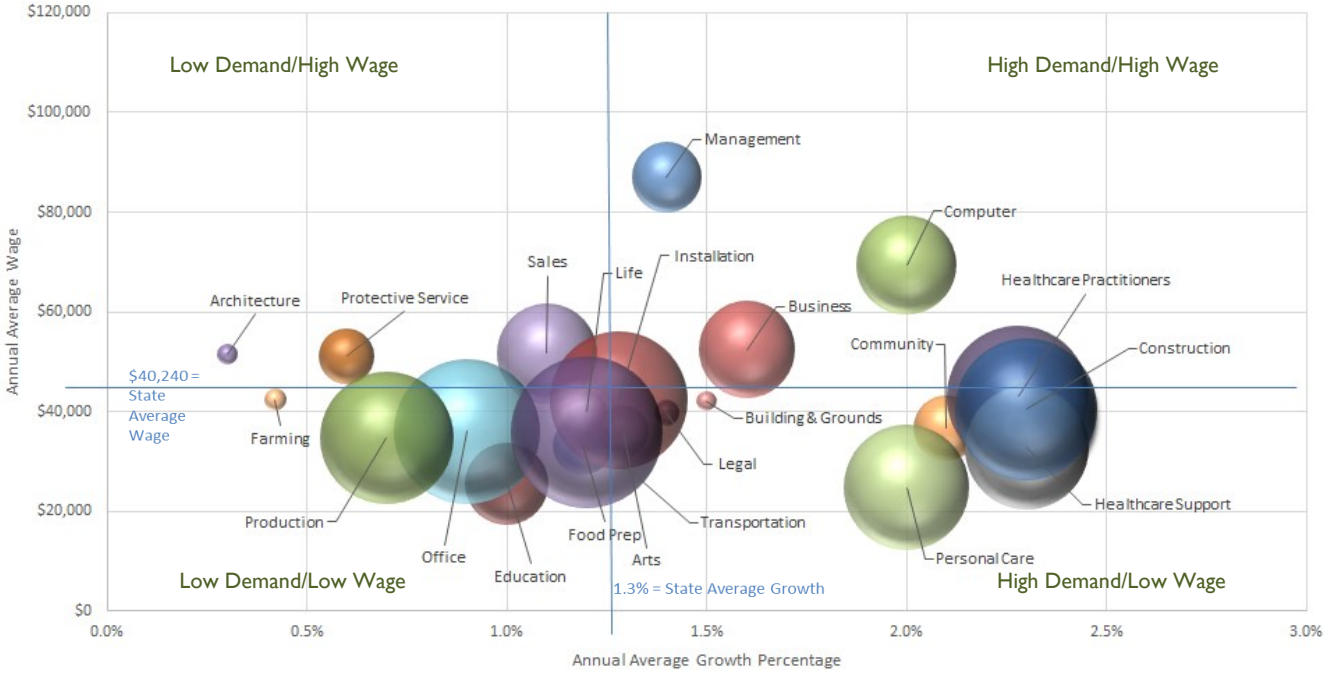


Figure 2. Statewide Annual Projected Job Openings by Occupational Category



Healthcare

Occupations and industries related to healthcare are projected to add the most new jobs between 2012 and 2022, as reported by the Bureau of Labor Statistics. In Iowa alone, healthcare practitioner, technical, and support occupations make up 160,000 jobs and are projected increase by approximately 5,200 jobs annually (both new and replacement jobs).

Iowa's community colleges awarded nearly 4,000 healthcare related credit awards to its students in 2013, especially those relating to registered nursing, licensed practical and licensed vocational nursing, and nursing assistant occupations. The healthcare occupations listed below and the bubble charts on the next page, represent jobs that are associated exclusively with community college training programs only and illustrate the impact that community college awards had in 2013. Comparing Figures 3 and 4, community colleges, by and large, are producing a sufficient number of awards in the health care field to match the anticipated need for health care occupations. Demand in these occupations is above the state average, but average wage is below the state average. Nevertheless, community colleges are also producing awards for high demand/high wage healthcare occupations and matching those up with anticipated demand.

Table 2. Statewide Annual Growth Rate, Salaries, Awards, & Projected Job Openings by Healthcare Occupation

Occupational Category	Annual Average Growth Rate	Average Annual Salary	Average Entry Salary	2013 Awards	Annual Projected Job Openings
Registered Nurses	1.7%	$ 53,524	$ 40,955	1,260	1,195
Nursing Assistants	1.4%	$ 25,311	$ 20,599	553	735
Home Health Aides	3.3%	$ 22,754	$ 18,810	0	540
Licensed Practical & Licensed Vocational Nurses	2.1%	$ 38,224	$ 31,923	990	345
Medical Assistants	2.3%	$ 30,612	$ 23,438	63	155
Pharmacy Technicians	2.0%	$ 28,964	$ 22,368	93	110
Dental Assistants	1.9%	$ 35,615	$ 27,373	78	110
Dental Hygienists	2.7%	$ 67,195	$ 57,693	81	105
Emergency Medical Technicians & Paramedics	1.6%	$ 33,044	$ 22,774	320	95
Medical Records & Health Information Technicians	1.8%	$ 34,436	$ 25,458	105	90
Radiologic Technologists	1.7%	$ 48,113	$ 37,224	54	80
Medical & Clinical Laboratory Technicians	2.5%	$ 40,637	$ 29,692	60	75
Physical Therapist Assistants	3.8%	$ 47,339	$ 35,740	82	50
Opticians, Dispensing	2.1%	$ 29,264	$ 21,307	0	45
Medical Transcriptionists	0.2%	$ 33,220	$ 26,297	20	45
Health Technologists & Technicians, All Other	2.5%	$ 39,163	$ 27,315	12	35
Physical Therapist Aides	2.8%	$ 26,481	$ 20,091	0	35
Respiratory Therapists	1.6%	$ 51,113	$ 41,437	47	30
Diagnostic Medical Sonographers	4.4%	$ 59,167	$ 48,896	0	30
Massage Therapists	2.7%	$ 33,555	$ 17,463	1	30
Dietitians & Nutritionists	2.0%	$ 52,570	$ 39,811	6	25
Veterinary Technologists & Technicians	2.8%	$ 31,137	$ 23,161	84	25
Occupational Therapy Assistants	4.4%	$ 51,659	$ 41,051	37	25
Surgical Technologists	2.5%	$ 38,236	$ 31,522	0	20
Veterinary Assistants & Laboratory Animal Caretakers	0.6%	$ 21,125	$ 16,739	0	20
Totals & Averages	2.3%	$ 38,898	$ 29,965	3,946	4,050

*All numbers in this chart are associated with community college related training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

Figure 3. Healthcare Credit Awards by Occupation

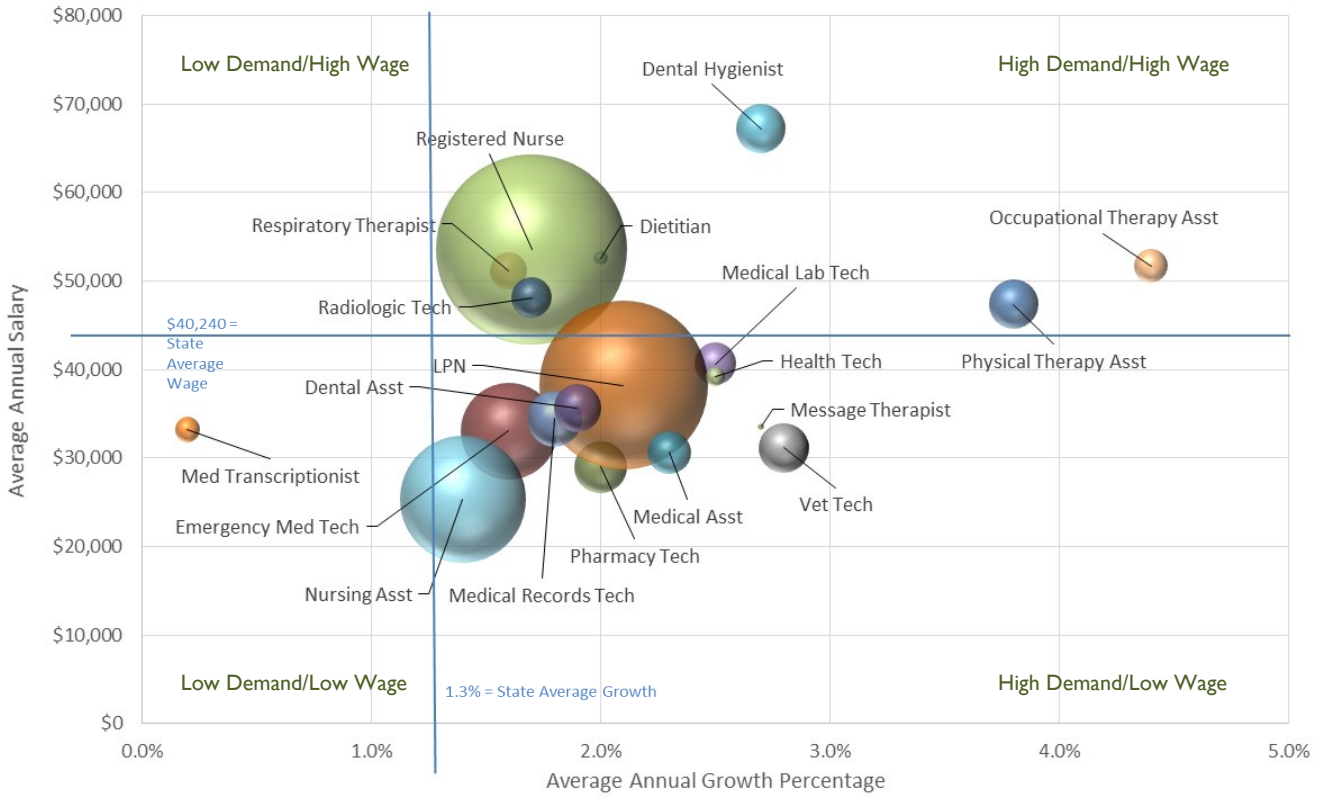
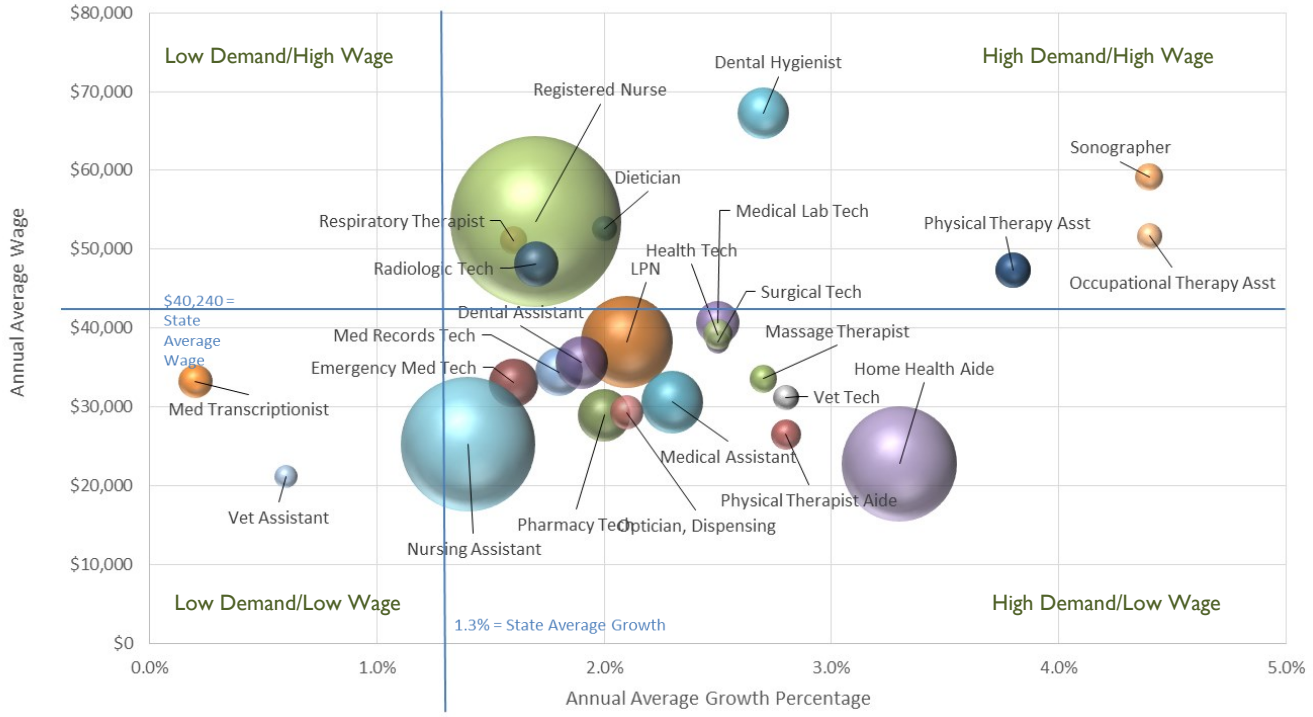


Figure 4. Statewide Annual Projected Job Openings by Healthcare Occupation



Information Technology

Computer and mathematical occupations are projected to grow by 2.12 percent in the next 10 years, yielding over 7,000 jobs. As Table 3, and Figures 7 and 8 show, community colleges awarded 457 certificates, diplomas, and associate degrees to graduates in 2013. The vast majority of these awards are in high demand, high wage occupations.

Annually, there is projected to be an increase in the occupations associated with a community college education or training of 2.0 percent with an average salary of $69,406. Even the average entry level salary of $46,345 exceeds the state average salary (see Table 3).

A considerable amount of skill, knowledge, or experience is needed for these occupations such as critical thinking, active listening, complex problem solving, programming, attention to detail, and communication skills. While many of the occupations in this area are seen as requiring at least a four-year degree, when taken together, Figures 5 and 6 indicate that many of the occupations which make up the information technology area, can be entered into with a community college award.

Table 3. Statewide Annual Growth Rate, Salaries, Awards, & Projected Job Openings by Information Technology Occupation

Occupational Category	Annual Average Growth Rate	Average Annual Salary	Average Entry Salary	2013 Awards	Annual Projected Job Openings
Computer Systems Analysts	3.1%	$ 77,326	$ 53,887	20	250
Computer User Support Specialists	2.3%	$ 40,632	$ 23,731	22	190
Computer Programmers	1.4%	$ 64,548	$ 42,653	206	160
Information Security Analysts	4.4%	$ 71,377	$ 49,885	0	115
Software Developers, Applications	1.8%	$ 76,749	$ 56,936	0	115
Network & Computer Systems Administrators	1.3%	$ 64,362	$ 46,228	44	95
Software Developers, Systems Software	1.9%	$ 90,778	$ 64,612	0	90
Computer Network Support Specialists	0.6%	$ 51,696	$ 36,272	0	35
Web Developers	1.7%	$ 60,028	$ 34,290	131	30
Database Administrators	1.7%	$ 73,192	$ 44,803	8	25
Computer Network Architects	1.8%	$ 92,779	$ 56,493	26	25
Totals & Averages	2.0%	$ 69,406	$ 46,345	457	1,130

*All numbers in this chart are associated with community college related training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

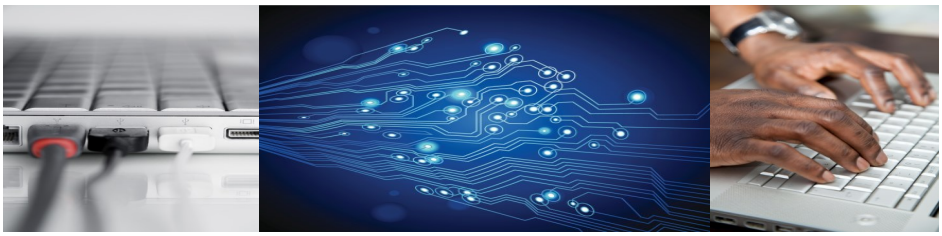
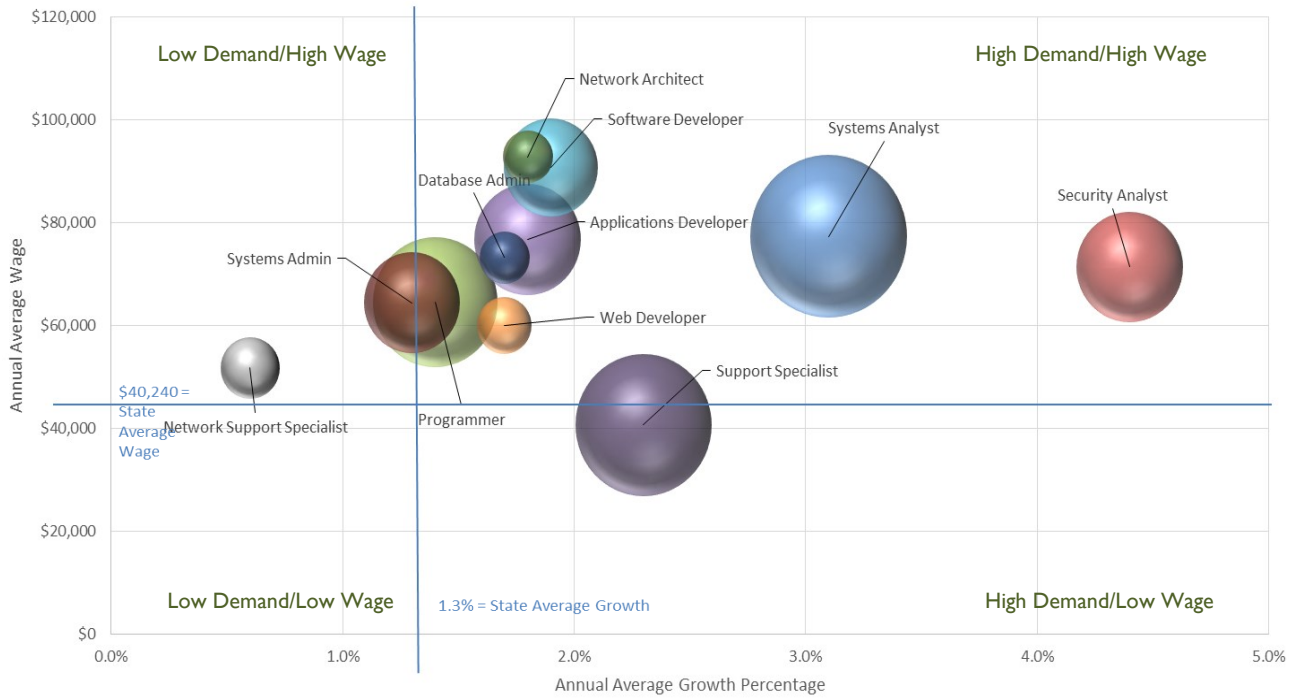


Figure 5. Information Technology Credit Awards by Occupation

Figure 6. Statewide Annual Projected Job Openings by Information Technology Occupation



Construction

Two characteristics of construction-related occupations must be given consideration when analyzing construction jobs in Iowa. First, a significant number of these occupations are seasonal. Second, many are apprenticeable occupations or are served by non-credit training programs. Therefore, when analyzing credit awards, it appears that very few awards are granted by community colleges.

However, most community colleges in Iowa work directly with employers to provide training specifically designed to meet their needs and further analysis of noncredit programs is planned to identify the impact that community colleges are having on this occupational category and industry.

Figure 4. Statewide Annual Growth Rate, Salaries, Awards, & Projected Job Openings by Construction Occupation

Occupational Category	Annual Average Growth Rate	Average Annual Salary	Average Entry Salary	2013 Awards	Annual Projected Job Openings
Carpenters	2.9%	$ 39,315	$ 27,403	113	415
Electricians	2.0%	$ 46,897	$ 31,721	25	285
Plumbers, Pipefitters, & Steamfitters	2.3%	$ 46,826	$ 29,665	2	225
Operating Engineers & Other Const Equipment Operators	2.0%	$ 43,340	$ 30,445	0	215
First-Line Supervisors of Const Trades & Extraction Workers	2.3%	$ 54,683	$ 36,092	0	190
Painters, Construction & Maintenance	3.2%	$ 38,518	$ 26,399	0	175
Cement Masons & Concrete Finishers	2.8%	$ 35,579	$ 24,669	4	165
Sheet Metal Workers	2.0%	$ 50,243	$ 31,395	0	80
Brickmasons & Blockmasons	3.2%	$ 44,054	$ 32,220	4	75
Highway Maintenance Workers	0.6%	$ 40,541	$ 31,145	0	75
Roofers	1.4%	$ 33,221	$ 21,988	0	65
Structural Iron & Steel Workers	2.3%	$ 52,309	$ 40,030	0	50
Drywall & Ceiling Tile Installers	2.0%	$ 37,679	$ 26,192	0	45
Carpet Installers	2.4%	$ 38,865	$ 24,416	0	35
Pipelayers	2.0%	$ 40,339	$ 27,070	8	30
Helpers--Electricians	2.9%	$ 28,602	$ 21,006	48	30
Fence Erectors	2.7%	$ 30,139	$ 23,437	0	30
Paving, Surfacing, & Tamping Equipment Operators	1.8%	$ 39,634	$ 27,346	0	25
Construction & Building Inspectors	1.3%	$ 52,604	$ 36,796	0	25
Helpers--Carpenters	2.4%	$ 29,739	$ 20,866	0	20
Glaziers	1.8%	$ 40,280	$ 27,919	0	20
Insulation Workers, Mechanical	4.2%	$ 38,185	$ 29,552	0	20
Helpers--Pipelayers, Plumbers, Pipefitters, & Steamfitters	2.4%	$ 29,097	$ 23,360	0	20
Totals & Averages	2.3%	$ 40,465	$ 28,310	204	2,315

*All numbers in this chart are associated with community college related training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

Figure 7. Construction Credit Awards by Occupation

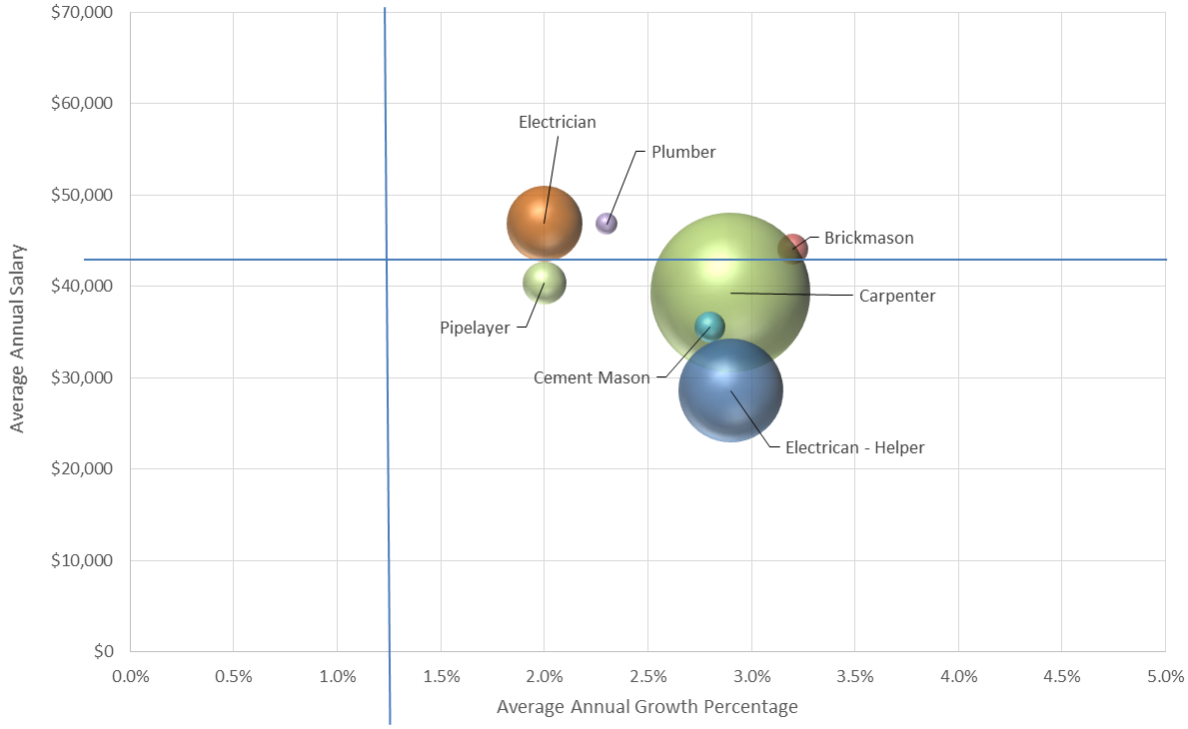
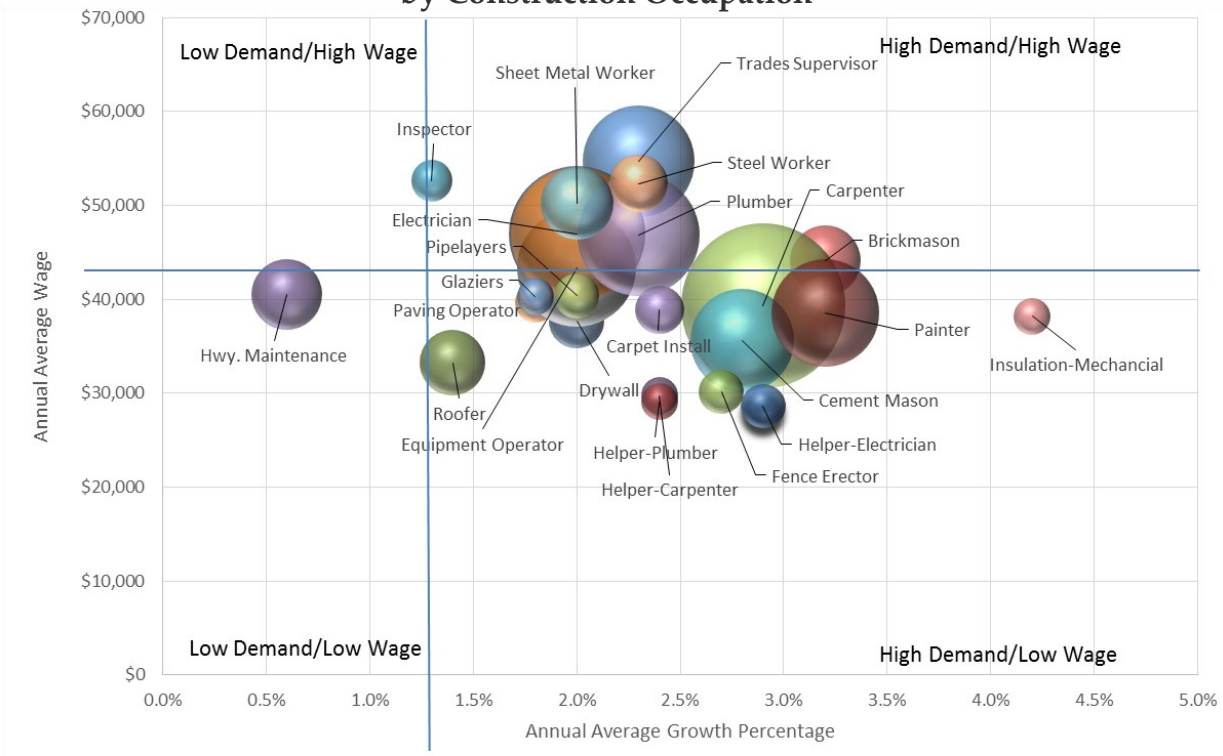


Figure 8. Statewide Annual Projected Job Openings by Construction Occupation



Advanced Manufacturing

Advanced manufacturing typically involves the use of innovative technology to improve products and processes, the skills required of workers in this segment are often more advanced than in other manufacturing settings. Table 5, and Figures 9 and 10, illustrate the credit awards related to the occupations found in advanced manufacturing. The jobs listed below in Table 5 were selected due to their relationship to production and concentration in an advanced manufacturing setting in addition to the skills associated with the job description.

When comparing Figures 9 and 10, it is apparent there is a mismatch between supply and demand with regard to advanced manufacturing. However, for specific occupations like machinists and welders, the community colleges awards closely match the anticipated demand. This is important because knowledge gained in these two occupations often form the basis for entry into several advanced manufacturing occupations.

To promote advanced manufacturing in the state, the Iowa Advanced Manufacturing Consortium (I-AM) is an Iowa community college initiative to elevate advanced manufacturing, funded through a previously announced $13 million grant from the U.S. Department of Labor's Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program. The grant focuses on employer engagement in I-AM initiatives which will benefit thousands of Iowans interested in a career in advanced manufacturing. Each community college will administer assessments for the program and enhance both credit and non-credit programs to support manufacturing careers.

Table 5. Statewide Annual Growth Rate, Salaries, Awards, & Projected Job Openings by Advanced Manufacturing Occupation

Occupational Category	Annual Average Growth Rate	Average Annual Salary	Average Entry Salary	2013 Awards	Annual Projected Job Openings
Machine Operators/Setters, General	0.9%	$ 31,559	$ 23,533	0	340
Welders, All	3.4%	$ 36,855	$ 28,363	474	270
Machinists	1.4%	$ 37,486	$ 28,133	143	205
First-Line Supervisors of Production & Operating Workers	0.6%	$ 51,755	$ 35,106	0	190
Inspectors, Testers, Sorters, Samplers, & Weighers	1.1%	$ 36,592	$ 23,696	0	180
Computer-Controlled Machine Tool Operators, Metal/Plastic	2.0%	$ 37,449	$ 29,485	1	135
Structural Metal Fabricators & Fitters	0.6%	$ 35,043	$ 28,214	0	90
Water & Wastewater Treatment Plant & System Operators	0.0%	$ 41,103	$ 26,426	24	85
Bakers	1.3%	$ 24,290	$ 17,679	14	50
Separating/Filtering/Clarifying/Precipitating/Still Mach Operators	0.6%	$ 38,707	$ 25,907	0	50
Chemical Plant & System Operators	0.6%	$ 48,025	$ 36,019	0	40
Molders, Shapers, & Casters, Ex Metal & Plastic	1.5%	$ 28,650	$ 18,591	0	40
Cabinetmakers & Bench Carpenters	1.1%	$ 33,171	$ 24,716	1	30
Chemical Equipment Operators & Tenders	0.7%	$ 42,729	$ 32,618	0	30
Dental Laboratory Technicians	0.6%	$ 35,215	$ 23,595	0	20
Ophthalmic Laboratory Technicians	1.6%	$ 29,183	$ 21,211	0	20
Totals & Averages	1.1%	$ 36,738	$ 26,456	657	1,775

*All numbers in this chart are associated with community college related training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

Figure 9. Advanced Manufacturing Credit Awards by Occupation

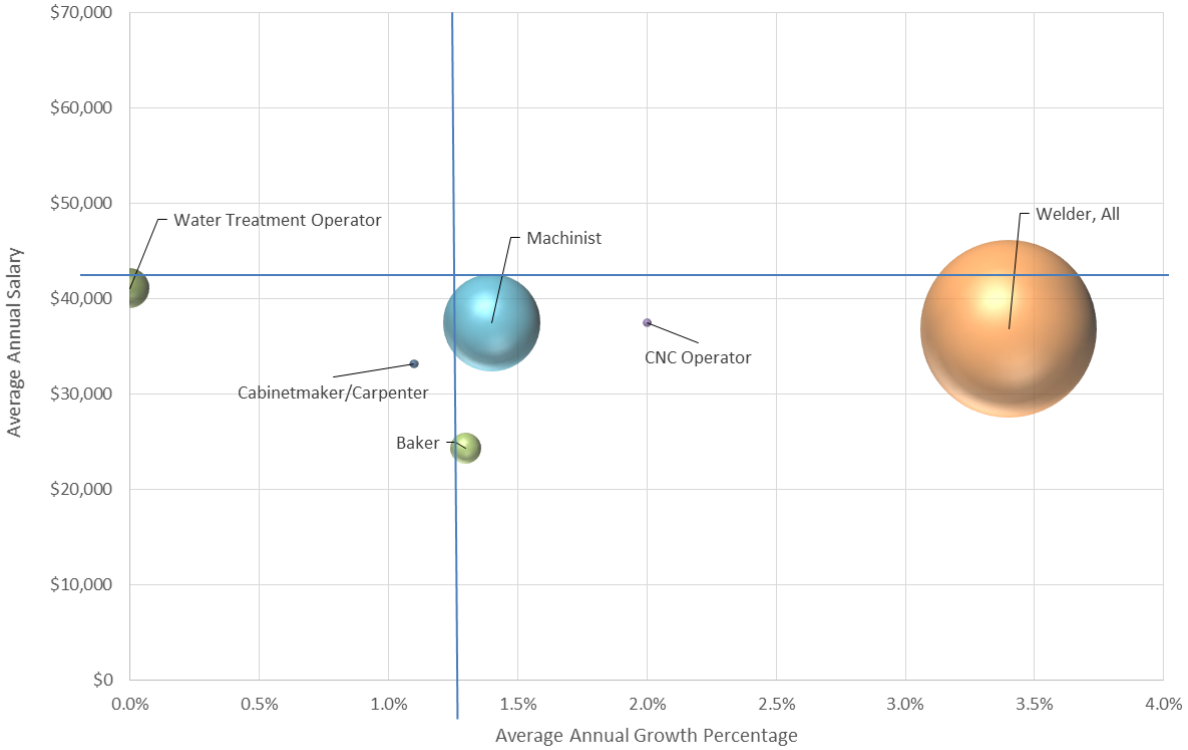
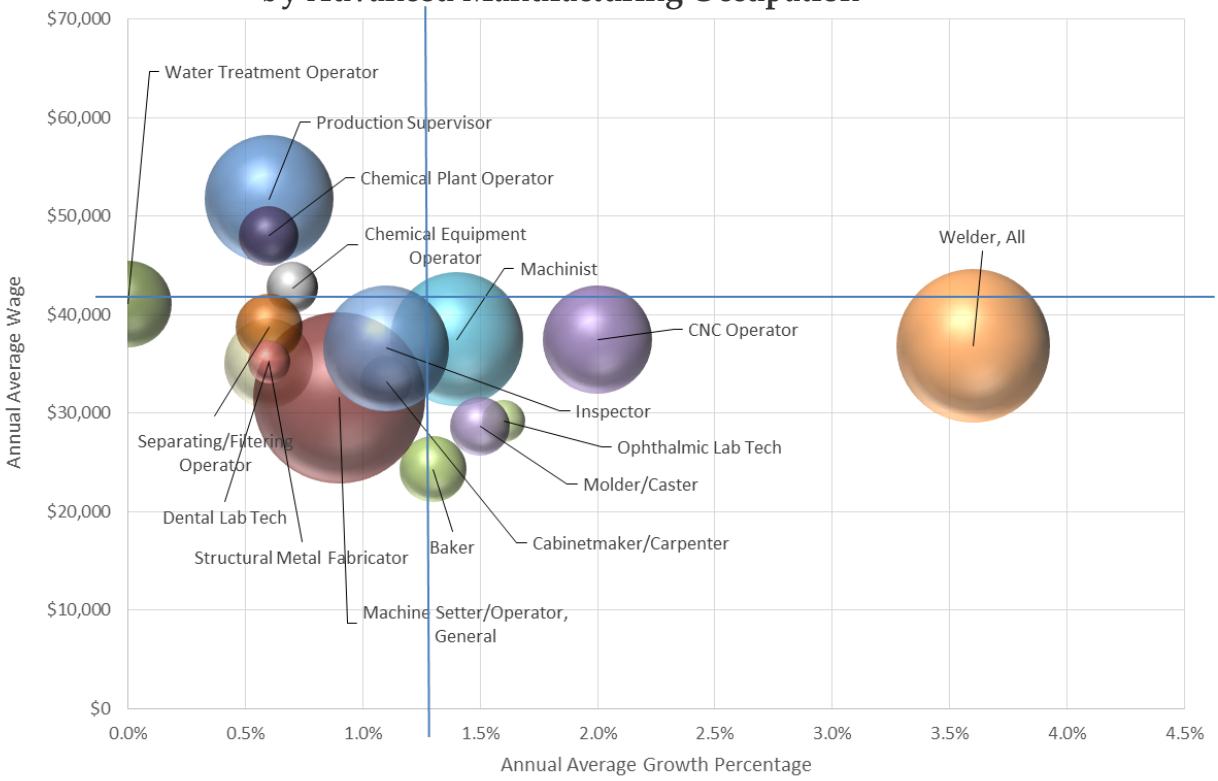


Figure 10. Statewide Annual Projected Job Openings by Advanced Manufacturing Occupation



Science, Technology, Engineering, & Mathematics

This report uses the following definition of Science, Technology, Engineering, and Mathematics (STEM) that has been accepted by the Iowa STEM Advisory Council:

> *"…an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering and mathematics in contexts that make connections between school, community, work and the global enterprise enabling the development of STEM literacy and with it the ability to compete in the new economy."*

An initial list of STEM occupations developed by the Iowa Department of Education for the STEM Advisory Council was cross-checked with those listed for STEM in O*NET and a combined list was produced identifying all STEM occupations (see Table 6) . An important to highlight here is that STEM occupations go beyond just the STEM cluster. When it comes to community college awards, nearly all tend to be in five career clusters: Health Sciences; Manufacturing; Transportation, Distributions, and Logistics; Information Technology; and Architecture and Construction.

Based on the above definition, the three areas — health care, advanced manufacturing, and information technology — described separately on previous pages of this report all fall under STEM. When comparing Figures 11 and 12, as expected, most STEM occupations are in the high demand/high wage category. Also, community colleges are producing awards to match anticipated demand. For STEM related occupational categories.

Figure 11. STEM Related Credit Awards by Occupational Category

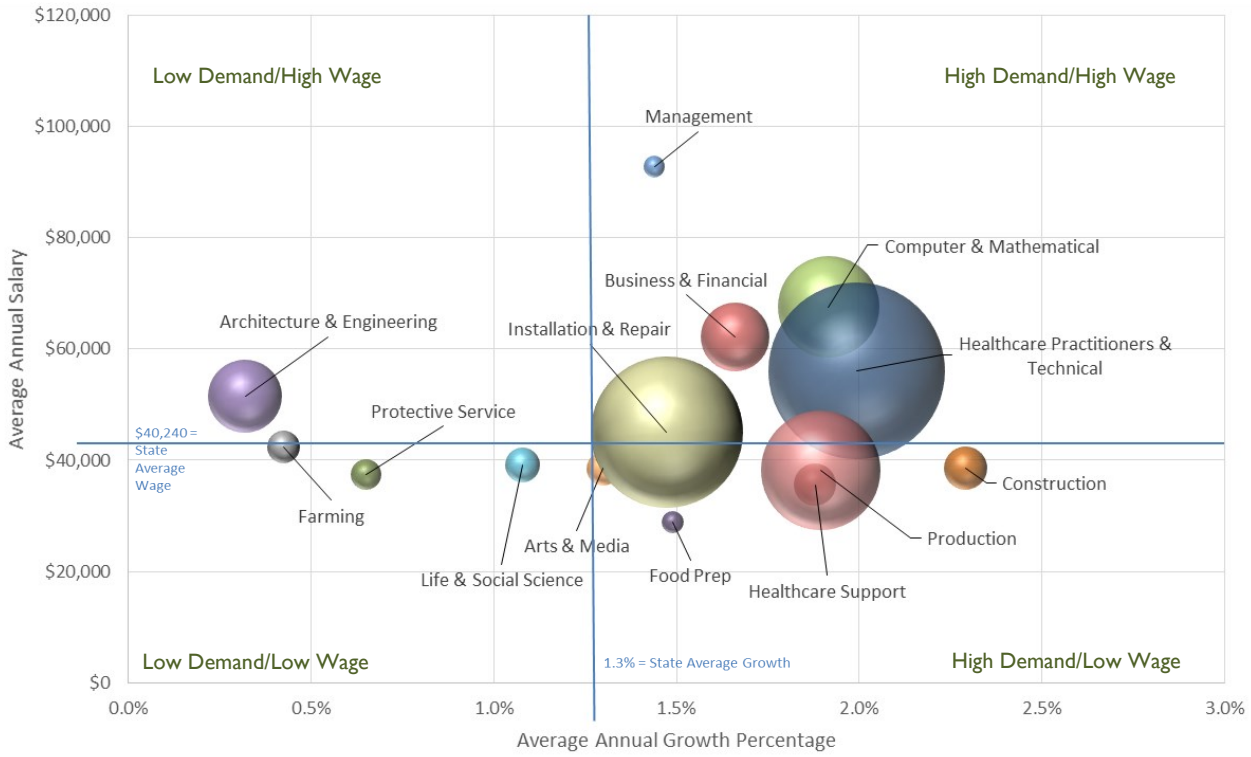


Figure 12. Statewide Annual Projected Job Openings by STEM Related Occupational Category

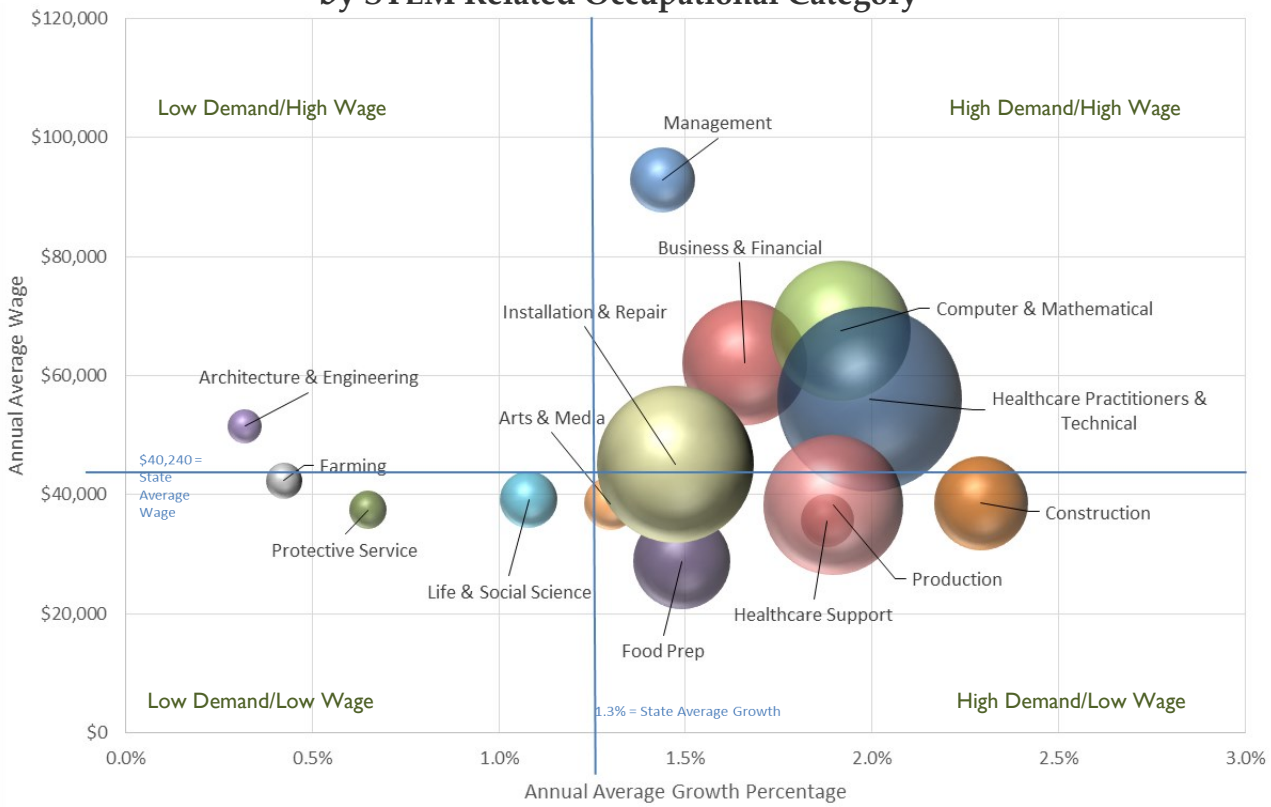


Table 6. Statewide Annual Growth Rate, Salaries, Awards, & Projected Job Openings by STEM Related Occupation

Job Title	Annaul Growth Percentage	Average Annual Salary	Average Entry Salary	Annual Projected Job Openings	2013 Awards
Construction Managers	2.2%	$ 73,944	$ 39,574	125	17
Architectural & Engineering Managers	0.7%	$ 111,723	$ 87,423	40	2
Management Occupations	1.4%	$ 92,834	$ 63,499	165	19
Accountants & Auditors	1.7%	$ 62,184	$ 39,988	615	208
Business & Financial Occupations	1.7%	$ 62,184	$ 39,988	615	208
Computer Systems Analysts	3.1%	$ 77,326	$ 53,887	250	20
Computer Programmers	1.4%	$ 64,548	$ 42,653	160	206
Web Developers	1.7%	$ 60,028	$ 34,290	30	131
Database Administrators	1.7%	$ 73,192	$ 44,803	25	8
Network & Computer Systems Admin	1.3%	$ 64,362	$ 46,228	95	44
Computer Network Architects	1.8%	$ 92,779	$ 56,493	25	26
Computer User Support Specialists	2.3%	$ 40,632	$ 23,731	190	22
Computer & Mathematical Occupations	1.9%	$ 67,552	$ 43,155	775	457
Electrical & Electronics Engineering Techs	0.0%	$ 56,473	$ 42,387	25	185
Industrial Engineering Techs	0.7%	$ 46,572	$ 34,394	20	55
Architecture & Engineering Occupations	0.3%	$ 51,523	$ 38,391	45	240
Agricultural & Food Science Techs	0.9%	$ 33,146	$ 23,331	50	27
Chemical Techs	0.9%	$ 42,971	$ 30,186	20	3
Forest & Physical & Social Science Tech	1.4%	$ 41,382	$ 25,304	55	22
Life, Physical, & Social Science Occupations	1.1%	$ 39,166	$ 26,274	125	52
Graphic Designers	1.3%	$ 38,503	$ 24,794	110	47
Arts, Design, Entertainment, Sports, & Media Occupations	1.3%	$ 38,503	$ 24,794	110	47
Dietitians & Nutritionists	2.0%	$ 52,570	$ 39,811	25	6
Respiratory Therapists	1.6%	$ 51,113	$ 41,437	30	47
Registered Nurse	1.7%	$ 53,524	$ 40,955	1,195	1,260
Dental Hygienists	2.7%	$ 67,195	$ 57,693	105	81
Healthcare Practitioners & Technical Occupations	2.0%	$ 56,101	$ 44,974	1,355	1,394
Dental Assistants	1.9%	$ 35,615	$ 27,373	110	77
Healthcare Support Occupations	1.9%	$ 35,615	$ 27,373	110	77
Firefighters	0.7%	$ 37,457	$ 19,536	55	41
Protective Service Occupations	0.7%	$ 37,457	$ 19,536	55	41
First-Line Supr. Food Prep & Serving	1.5%	$ 28,781	$ 19,122	365	20
Food Preparation & Serving-Related Occupations	1.5%	$ 28,781	$ 19,122	365	20

Table 6 (cont'd). Statewide Annual Growth Rate, Salaries, Awards, and Projected Job Openings by STEM Related Occupation

Job Title	Annaul Growth Percentage	Average Annual Salary	Average Entry Salary	Annual Projected Job Openings	2013 Awards
First-Line Supr. Farming	0.4%	$ 51,114	$ 32,450	30	19
Animal Breeders	0.5%	$ 33,595	$ 24,865	20	27
Farming, Fishing, & Forestry Occupations	0.4%	$ 42,355	$ 28,658	50	46
Electricians	2.0%	$ 46,897	$ 31,721	285	25
Pipelayers	2.0%	$ 40,339	$ 27,070	30	8
Helpers-Electricians	2.9%	$ 28,602	$ 21,006	30	48
Construction & Extraction Occupations	2.3%	$ 38,613	$ 26,599	345	81
Compuer, Automated Machine Repair	1.0%	$ 58,596	$ 39,140	155	101
Automotive Body Repair	1.6%	$ 39,681	$ 24,784	80	185
Automotive Service Tech	1.6%	$ 39,681	$ 24,784	80	244
Bus & Truck Mechanics	1.3%	$ 38,383	$ 27,018	140	86
Farm Equipment Mechanics	0.7%	$ 36,885	$ 26,601	70	88
Heating, AC, & Refrigerator Mechanics	2.4%	$ 46,366	$ 31,100	160	241
Industrial Machinery Mechanics	2.6%	$ 43,334	$ 31,618	230	74
Electrical Power-Line Installers & Repair	0.7%	$ 57,504	$ 40,239	65	13
Installation, Maintenance, & Repair Occupations	1.5%	$ 45,054	$ 30,661	980	1,032
Computer Controlled Machine Tool Operator	2.0%	$ 37,449	$ 29,485	135	1
Machinist	1.4%	$ 37,486	$ 28,133	205	143
Welders, Cutters, Solderers, & Brazers	3.4%	$ 36,855	$ 29,859	350	474
Water & Wastewater Tratment Plant & System Opeartors	0.8%	$ 41,103	$ 26,426	85	24
Production Occupations	1.9%	$ 38,223	$ 28,476	775	642
Totals and Averages (All)	1.4%	$ 48,140	$ 32,964	5,870	4,356

*All numbers in this chart are associated with community college related training/education only. Those that exceed or do not require the training needed for particular occupations have been excluded.

Source: STEM occupations derived from O*NET online cross referenced with National Crosswalk CIP to SOC.

(***Continued from page 5)***

Iowa's community college 2012-2013 awards by occupational category were placed across the demand/wage grid as bubbles, where the placement of the bubble shows which demand/wage quadrant the awards reside. The size of the bubble approximates the number of awards within that quadrant (Figure 1). Similarly, statewide Iowa annual projected job openings by occupational category were placed on the same demand/wage grid, where the placement of the bubble shows which demand/wage quadrant the projected occupations are needed and the size of the bubble approximates the number needed for the projected occupations within that quadrant (Figure 2). It is important to reiterate that only those occupations relating to community college education and training are used in aggregate for this chart, all others have been excluded from the totals.

Limitations

Throughout the report there are occupational categories which may have awards but no projected demand. This does not mean there are no projected job openings in the category; rather it indicates there are too few businesses or jobs to sufficiently project market demand for the next ten years.

Due to confidentiality restrictions, certain occupations were not included in the report. Conversely, there will be occupational projections with no associated awards. Since the awards are inclusive of all credit awards received at each college (less liberal arts and multi-disciplinary), this indicates that the college either granted no awards in that particular occupational category or the training is a non-credit or apprenticeship program. For example, though transportation is an occupational category in high demand, the figures show few or zero awards for 2013 in most community college regions. This is reflective of the fact that the majority of CCs offer non-credit programs related to transportation or trucking which are not reflected in the number of 2013 awards used for this analysis.

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http://www.bls.gov/oes/current/oes_ia.htm

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Iowa Long-Term Occupational Projections 2012-2022

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