EXPLORING THE SKILLS GAP IN IOWA

Liesl Eathington and Dave Swenson[1]

INTRODUCTION

Perspectives are wide-ranging about the readiness, quality, and supply of the nation's workforce when it comes to incorporating ever-increasing skill demands in the workplace. The oft-publicized and currently prevailing assumption is that many workers are inadequately trained or educated to meet modern workforce demands.[2] This lament is most often centered on skilled manufacturing production jobs, information technology positions, and in health services.

While discussions of various types of skills gaps have been around for quite some time, the peak of recent complaints coincided with a time when national unemployment across all occupations was very high. How, one should ask, could there possibly have been a skills shortage when so many skilled workers were out of work? The widespread conclusion was and still is that despite high unemployment, the workforce was nonetheless insufficient to meet many industries' talent needs.

Usage of the term "skills gap" is frequently vague and broad – which skills and why, how big is the gap, and where is it? This research looks at the skills gap topic from the standpoint of

- Investigating the broad nature of recent occupational change in the U.S.,
- Developing descriptive indicators of skill levels using occupational groupings, and
- Comparing and contrasting skill supply and demand indicators across states

Our research puts the skills gap discussion into temporal, regional, and dimensional context to differentiate among types of occupational employment change occurring in the U.S. We find notable shifting among so-called middle skill occupations, but as a whole, middle skill jobs have not demonstrably increased their share of the U.S. economy. We also conclude that producing credible evidence of a middle skills gap requires analytical and definitional-specificity that is simply not possible using state or regional secondary data.

---

[1] Both authors are scientists in the Department of Economics, Iowa State University. Excerpted in part from a paper prepared for and presented at the 54th Southern Regional Science Association Annual Meeting, Mobile, AL, March 27, 2015.

[2] See as examples, Jamie Dimon and Marlene Seltzer, Closing the Skills Gap, Politico, 5 January 2014; Marice A. Jones, Sara Goldrick-Rab, Dennis Brown, and Chauncy Lennon, Paying for Workers' Training, New York Times, 19 March 2015; and for a decidedly contrarian view on the topic, Paul Krugman, Jobs and Skills and Zombies, New York Times, 30 March 2014.

SECTION 1: THE SKILLS GAP DEBATE

1.1 Conflicting research

Several prominent research sources decry a current and looming skills gap, yet other respectable sources aver there is no skills gap, per se, and that skills gap complainers are crying wolf. Still others note that the nation's skill demands are increasing, there are differential consequences to those demands, and it is very difficult to discern whether the supply of skilled labor is in fact seriously undermining U.S. productivity.

Recent media coverage and state policy developments concerning a skills gap in the U.S. have been based in part by studies done for the National Association of Manufacturers as well as other studies sponsored by business groups and higher education institutions (see, as examples, Deloitte 2011, 2015 and Bridgeland, et al, 2011) claiming there are tangible and worrisome skill shortages that will only worsen as Baby Boomers retire. These studies call for both public and public/private interventions to remedy the situation. As a result, many states have responded with policy and program developments intended to shunt more students and adult learners into shortage professions.

A skills gap debate arises, however, because there are many studies casting doubt on the prevailing skills gap narrative. As examples,

- Sahin, et al, (2012) found only temporary mismatches during the Great Recession and that those mismatches disappeared as business conditions improved.
- Lazeer and Spelzer (2012) validated this across industries and occupations – no mismatches were found that were lasting.
- Autor (2010) and Jaimovich and Siu (2012) concluded that job skills polarization is more of an issue, that middle skills territory is not growing, but is instead "hollowing out" mostly due to routine jobs being replaced by automation.
- Osterman and Weaver (2014) found that manufacturers tended to grossly overestimate their worker shortages if survey questions were not crafted properly or the surveys were not administered to the right person, and
- Bivens and Shierholz (2014) could not find, across a range of measures, any traditional economic "signatures" of skills gaps (hours, wages, and unemployment rate differentials among different occupation groups, different industry groups, or education level etc.)

These contradictory studies notwithstanding, it is still widely assumed that the nation is suffering from a significant skills gap, a structural problem in need of social intervention.

1.2 Vague terminology

Vague terminology may be partially to blame for differing opinions about the middle skills gap, as the terms "skills gap" and "middle skills" are both open to wide interpretation.

When there is an imbalance between particular elements of labor demand and labor supply that discomforts employers, the imbalance is called a labor shortage, or in recent years a skills gap, owing to the fact there has been a demonstrable surplus of workers during the most recent recession and recovery. When there is a supply and demand imbalance that discomforts workers, it is called unemployment. And if unemployed workers do not have or cannot obtain the requisite skills to fill industry needs, then there is an economic problem potentially requiring public action. The test, then, is to discern whether there is an actionable economic problem in need of a remedy.

The term "middle skills" may mean different things to different types of employers. Manufacturing production does not hold a monopoly on middle-skills, it has just 14.5 percent of middle-skill jobs according to our research. But that sector is significantly dominating the skills gap discussion, especially in the manufacturing-dependent Midwest. Broadening the discussion to all industries depending on middle-skill occupations allows for a more realistic characterization of anticipated worker needs and the roles that educational and other human resource developing institutions may help play in meeting future needs.

1.3 Regional differences

Yet another factor clouding the middle skills gap debate is the likelihood that it varies by region. There are pronounced differences in the educational or skill levels of the workforces across the states and major regions. A skills gap discussion in San Jose, California, will differ significantly from a skills gap discussion in Peoria, Illinois, owing primarily to the overall industrial mixes in those two places.

Are there significant and productivity-reducing labor mismatches in the U.S. that have emerged of late and are distinct from long term patterns of domestic migration, occupational growth, and worker preparedness? Are there basic tools that can be applied to this discussion that help us understand by occupation and by region just what might be happening in the nation's middle-skill workforce? Investigating cross state variability should help us understand more about the nation's ostensible middle-skills situation and outlook.

SECTION 2: DEFINING MIDDLE SKILLS

Our analysis applies an occupation-based definition of middle skills. We define middle skill occupations as those typically requiring some education or moderate training/experience beyond high school but less than a 4-year college degree. Occupations meeting these requirements are identified using U.S. Bureau of Labor Statistics (BLS) Employment Projections Program data that describe the typical education and training requirements for 820 of detailed occupations within the 2010 Standard Occupational Classification (SOC) system. Table 1 shows examples of the education and training profiles for selected occupations.

Table 1

2012 National Employment Matrix title and code		Typical education needed for entry	Work experience in a related occupation	Typical on-the-job training needed to attain competency in the occupation	Skill Weight*
Computer programmers	15-1131	Bachelor's degree	None	None	11
Web developers	15-1134	Associate's degree	None	None	10
Database administrators	15-1141	Bachelor's degree	Less than 5 years	None	12
Economists	19-3011	Master's degree	None	None	13
Court reporters	23-2091	Postsecondary non-degree award	None	Short-term on-the-job training	8
Economics teachers, postsecondary	25-1063	Doctoral or professional degree	None	None	14
Teacher assistants	25-9041	Some college, no degree	None	None	9
Hearing aid specialists	29-2092	High school diploma or equivalent	None	None	2
Sheet metal workers	47-2211	High school diploma or equivalent	None	Apprenticeship	6
Machinists	51-4041	High school diploma or equivalent	None	Long-term on-the-job training	5
Welders, cutters, solderers, and brazers	51-4121	High school diploma or equivalent	None	Moderate-term on-the-job training	4
Laundry and dry-cleaning workers	51-6011	Less than high school	None	Short-term on-the-job training	1
Flight attendants	53-2031	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	7
Bus drivers, school or special client	53-3022	High school diploma or equivalent	None	Short-term on-the-job training	3
Source: Employment Projections program, U.S. Department of Labor, U.S. Bureau of Labor Statistics					

To aggregate occupations into discrete skill groups, we combine elements from the education, experience, and training dimensions into a single "skills" continuum with 14 levels, then use the continuum to score and group all 820 detailed occupations. Group 14 occupations have the highest education/training requirements, Group 1 the lowest. Middle skill jobs include all occupations in Groups 4-10. We further distinguish upper middle skill jobs (Groups 8-10), which typically require some college or associate degree, from lower middle skill jobs (Groups 4-7), which generally do not require formal educational attainment beyond high school but do require related experience or

higher levels of on-the-job training. Table 2 summarizes the requirements profiles for the four major occupational skill groupings.

With a share of 43 percent, low skill jobs comprise the largest share of the U.S. economy. High skill jobs are the smallest group with 23 percent. Middle skill occupations accounted for about 34 percent of all U.S. jobs in 2013. Two thirds of all middle skill jobs fall into the lower middle skill category and one third are upper middle skill.

Table 2

Skill group	Typical educational attainment for entry	Work experience in a related occupation	Typical on-the-job training required for competency	Percentage of U.S. jobs in 2013	Skill level
High Skill	Doctoral or professional degree			3%	14
	Master's degree			2%	13
	Bachelor's degree	Any related work experience		5%	12
		None		13%	11
Upper Middle Skill	Associate degree			4%	10
	Some college, no degree			1%	9
	Postsecondary vocational award			6%	8
Lower Middle Skill	High school diploma or equivalent	Apprenticeship		1%	7
		Any related work experience		6%	6
		None	Long-term	4%	5
			Moderate-term	12%	4
Low Skill	High school or equivalent	None	Short-term	15%	3
			None	1%	2
	Less than high school			27%	1

SECTION 3: MIDDLE SKILL JOB CHANGE IN THE U.S.

The share of middle skill jobs in the U.S. economy eroded slightly from 2007-2013 from 36 percent to 34 percent. Growth of 4.3 percent in upper middle skill jobs could not offset the nearly 10 percent decline in lower middle skill jobs, resulting in an overall net decline of 5.6 percent in middle skill jobs. Low skill jobs declined by 1.8 percent. High skill jobs grew by 6.9 percent.

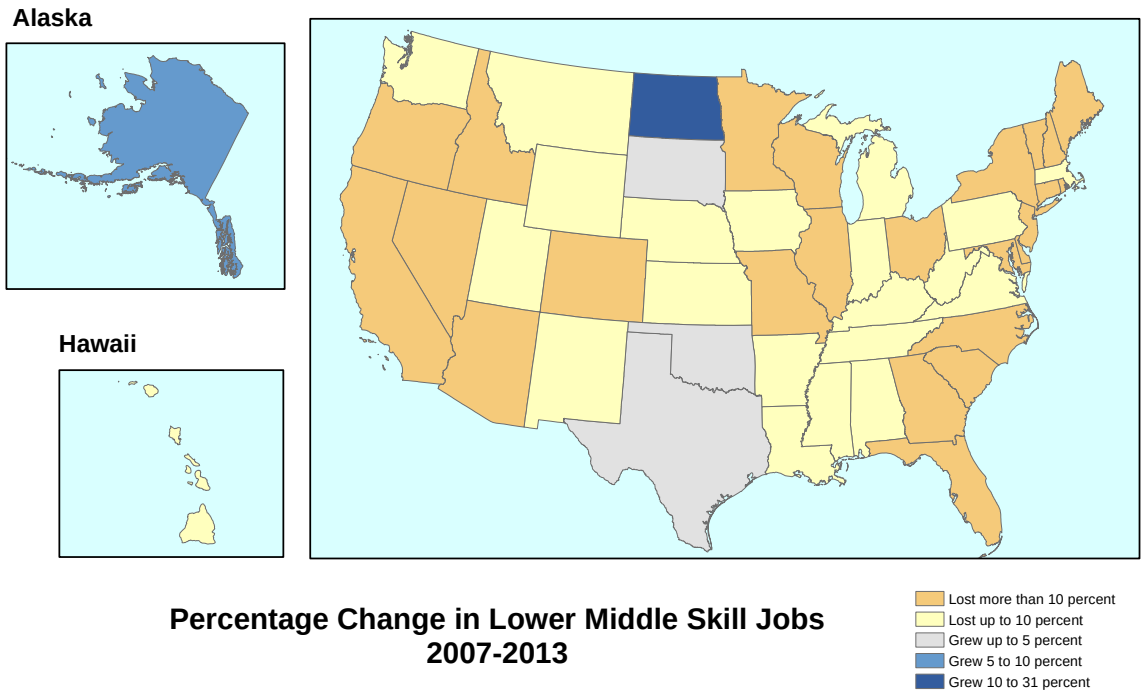
Few states deviated from the general pattern of employment loss in lower middle skill jobs and gains in upper middle skill jobs. Maps 1 and 2 illustrate employment change rates by state and occupation group from 2007-2013. Iowa lost 1.9 percent of its lower middle skill jobs, much better than the national average decline of nearly 10 percent. Nevada had the greatest loss of lower middle skill jobs with its loss of 23 percent. Lower middle skill jobs in North Dakota grew more than 30 percent. Iowa's growth rate of 7.6 percent in upper middle skill jobs well exceeded the national average rate of 4.3 percent. North Dakota led all states in this category with a growth rate of 29 percent.

BLS employment projections suggest that growth rates in upper middle skill jobs will continue to outpace lower middle skill jobs throughout the next decade. Upper middle skill jobs will grow by nearly 16 percent nationally from 2012-22. Lower middle skill jobs are projected to grow by less than 8 percent, the slowest rate among the four major skill groupings. Figure 1 illustrates recent and projected U.S. employment growth rates by skill grouping.

Figure 1

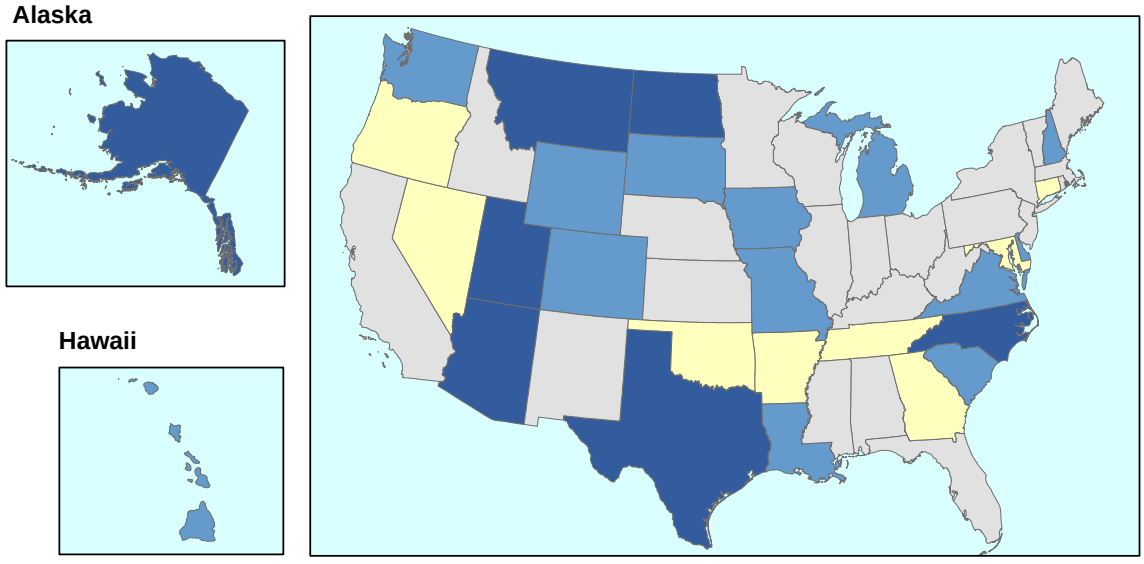
Actual and Projected U.S. Employment Change by Skill Group

Map 1



Percentage Change in Lower Middle Skill Jobs 2007-2013

Map 2



Percentage Change in Upper Middle Skill Jobs 2007-2013

Despite their comparatively higher rates of growth, upper middle skill occupations will not noticeably increase their share of all U.S. jobs during the next decade. BLS projections show upper middle skill jobs growing from 11 percent to 12 percent of all jobs by 2022. Lower middle skill jobs will hold steady at 24 percent. The two middle skill categories combined will add nearly 5.4 million new jobs by 2022, with the net number of new jobs split nearly evenly between upper middle and lower middle skill categories.

Many existing middle skill jobs will open during the next decade as workers retire or otherwise permanently leave their current occupations. According to BLS projections, the number of middle skill job openings due to growth plus replacement needs may exceed 16.3 million jobs from 2012-22. Lower middle skill occupations will account for 63 percent of middle skill job openings and 20 percent of job openings overall. Upper middle skill occupations will account for 12 percent of U.S. job openings; high skill occupations will account for 22 percent; and low skill jobs will account for 46 percent of the nation's job openings.

SECTION 4: MEASURING A MIDDLE SKILLS GAP

This section looks at state-level variations in several ostensible measures of the middle skills gap. Two alternative skills gap measures are examined in context with other indicators relevant to the skills gap discussion such as recent rates of middle skill job growth or decline, rates of change in post-secondary educational program enrollment, and migration patterns of middle skill workers. Any evidence of relationships among these variables across states might help to inform policy responses at the regional level.

4.1 GAUGING CURRENT MIDDLE SKILL WORKER SUPPLY AND DEMAND

A key challenge in detecting a skills gap involves finding adequate measures for the supply of and demand for middle skill workers in each state. An ideal measure of *supply* would take into account the specific skills, knowledge, and experience possessed by labor force members – information that could only be obtained from systematic testing or detailed surveys of workers. An ideal measure of *demand* would quantify the specific staffing needs and desires of employers, including both filled and unfilled positions. For this study, we must rely on secondary data for our measures of both supply and demand, accepting from the outset that they have serious limitations. Some of these limitations are discussed in greater detail in Section 5.

Each state's middle skill supply is measured using the estimated number of "middle-educated" workers in residence. They include labor force members between 18-64 years of age, both employed and unemployed, who possess an associate degree or any post-secondary educational experience below a bachelor's degree. For this measure, we use data from the U.S. Census Bureau's Current Population Survey.

We define middle skill demand as total employment in lower middle and upper middle skill occupations. State-level estimates are derived by summing occupational employment estimates from the BLS Occupational Employment Statistics Program.

4.2 Skills gap ratios

Using our estimates of middle-educated workers and middle skill jobs by state, we construct two alternative ratios to compare middle skill worker supply and demand.

Gap Ratio 1:

Ratio 1 simply compares the number of middle-educated workers to the total number of middle skill jobs. Nationally, there were about 95 middle-educated labor force members per 100 middle skill jobs in 2013. Iowa's score on this measure equaled the U.S. average. See Map 1 for an illustration of state-level values for this indicator.

A glaring weakness of Ratio 1 is that, by definition, we have included a large number of jobs in the denominator while excluding workers who might hold those jobs from the numerator. For example, any job requiring a high school diploma and moderate to long-term on-the-job training or related work experience is counted toward a state's middle skill job demand, but workers meeting those qualifications are excluded from the middle skill worker supply if their formal education ended with high school. This is no mere measurement trifle: the types of jobs in question (Skill Groups 4-6) account for more than 20 percent of all U.S. occupations.

Gap Ratio 2:

Given the failure of Ratio 1 to capture workers' training and experience levels, our second skills gap indicator focuses on the more easily measured educational attainment dimension. For Ratio 2, we first construct a hypothetical value for the expected number of middle-educated workers by state. The expected values are derived from national staffing patterns showing the distribution of workers by their educational attainment and detailed occupation. Table 3 illustrates this information for a single occupation, showing the percentage of welders by their highest degree attained.

Table 3

2012 National Employment Matrix title and code		Less than high school diploma	High school diploma or equivalent	Some college, no degree	Associate's degree	Bachelor's degree or higher
Welders, cutters, solderers, and brazers	51-4121	22.6	49.5	20.2	5.8	2.0

For each detailed occupation, we multiply the state's number of jobs by the percentage expected to have some college or associate degree, then sum across all occupations. Workers in each state are assumed to follow the national educational distributions by occupation. The expected values are then compared to state-level CPS estimates for middle-educated workers.

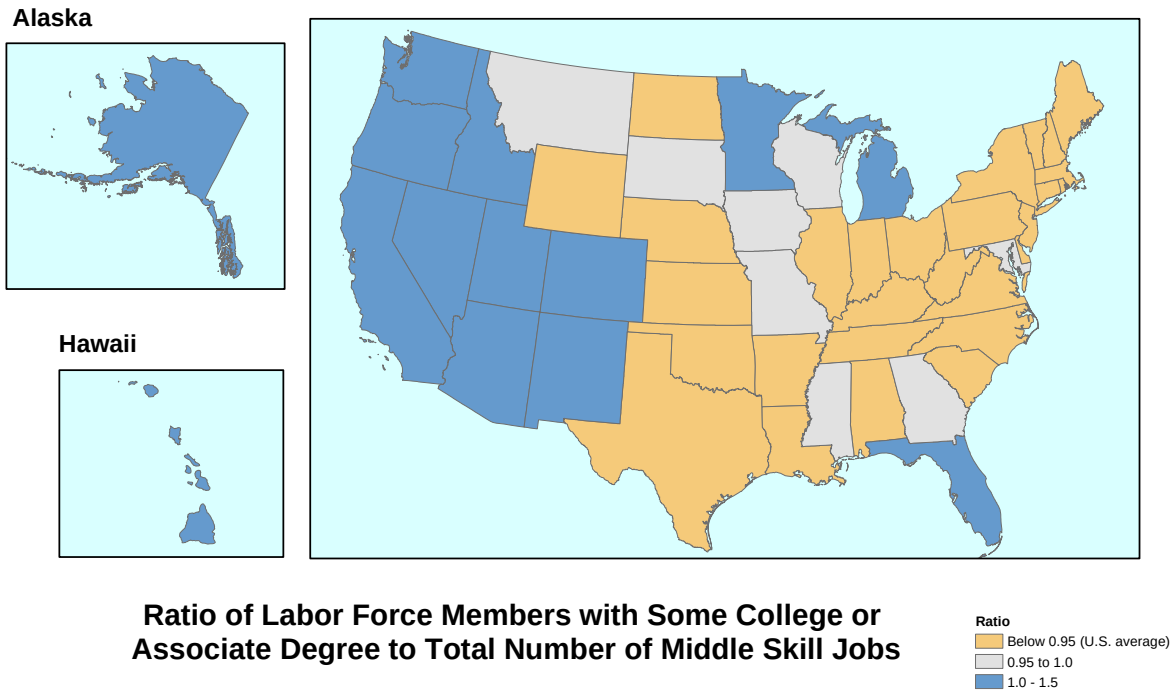
The U.S. average value for Gap Ratio 2 was 1.0, meaning that the actual and expected numbers of middle-educated workers are roughly equal at the national level. Map 2 illustrates the variation in Ratio 2 by state. Iowa's score of 1.1 indicates that the state has 10 percent more middle-educated workers than might be expected given the occupational distribution of its economy.

4.3 Indirect Skills Gap Indicators

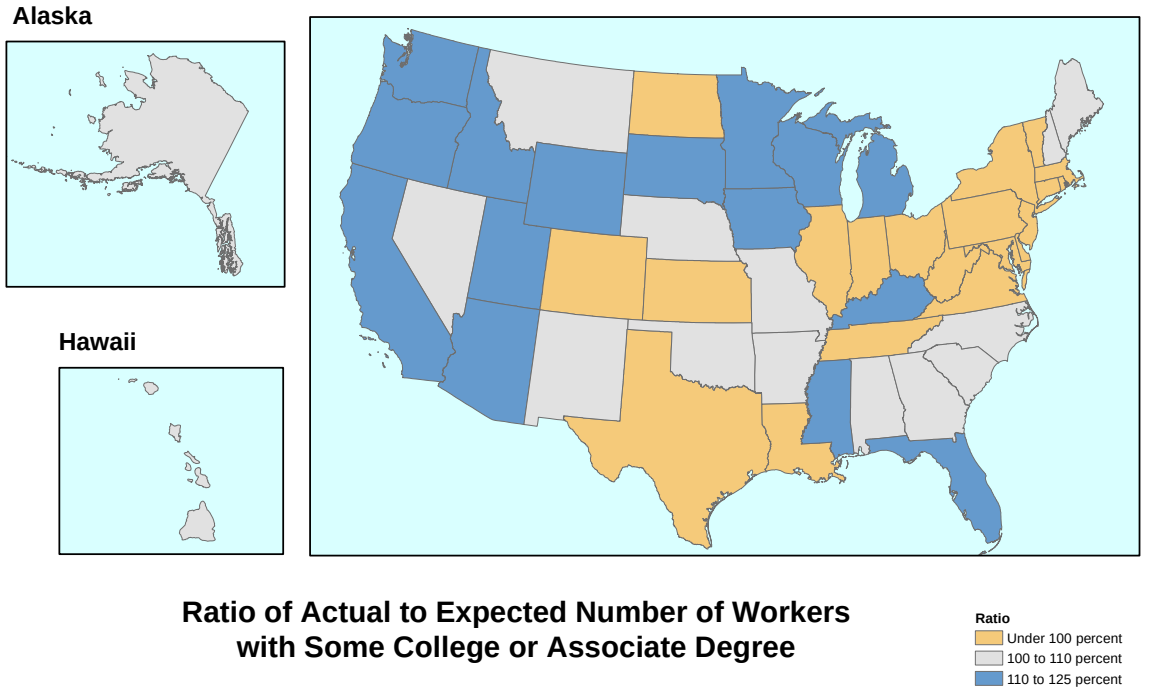
Using current middle skill employment as a proxy for employer demand fails to address the possibility of unmet demand for middle skill workers. While it isn't possible to measure unmet demand using secondary data, we can look for indirect evidence that state labor markets are responding to employers' demand cues.

If a state's middle skill labor supply is tight, market forces should work to increase the regional supply of middle skill workers. Possible responses include either increased migration of new workers to areas where job prospects are promising, or increased enrollment in educational programs that prepare workers for high-demand jobs. We have compiled skills gap indicators to address both of these possibilities. The first indicator describes rates of net domestic migration among labor force members with one to two years of college; and the second describes the percentage growth in number of post-secondary educational program completions in selected areas of study relevant to the middle skills debate. For the net migration of workers with some college credit, Iowa's rate of 2/10ths percent per year ranked 21st among all states. Iowa's 44 percent growth in program completions just exceeded the national average of 43 percent. Maps 5 and 6 display state-level values for these variables. Appendix 1 contains a more detailed description of the educational program completions data.

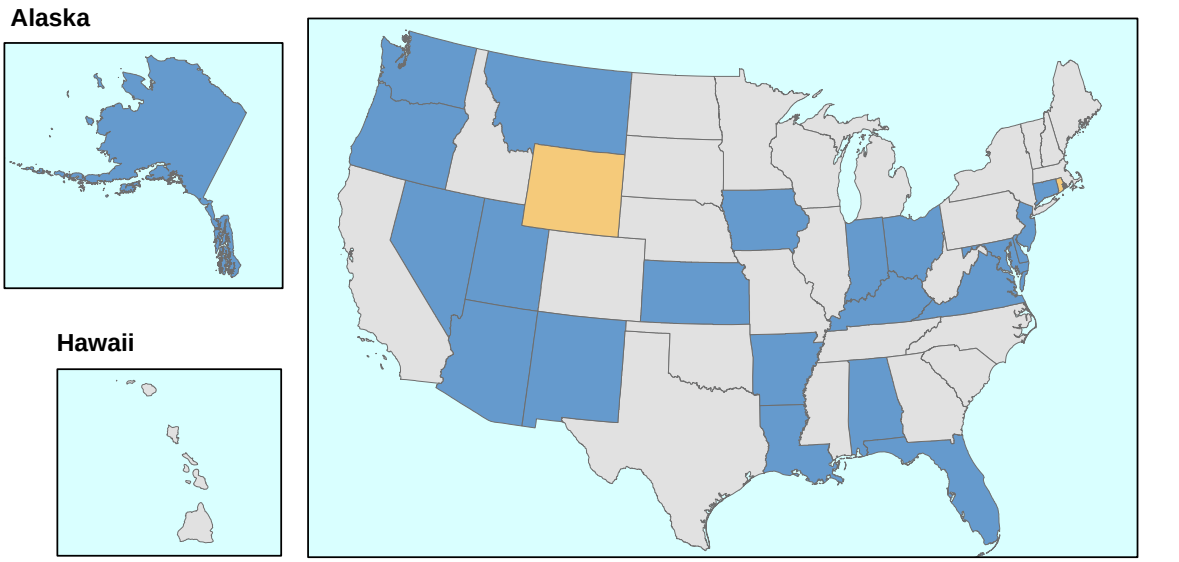
Map 3


Alaska
Hawaii
Ratio of Labor Force Members with Some College or Associate Degree to Total Number of Middle Skill Jobs
Ratio
Below 0.95 (U.S. average)
0.95 to 1.0
1.0 - 1.5

Map 4

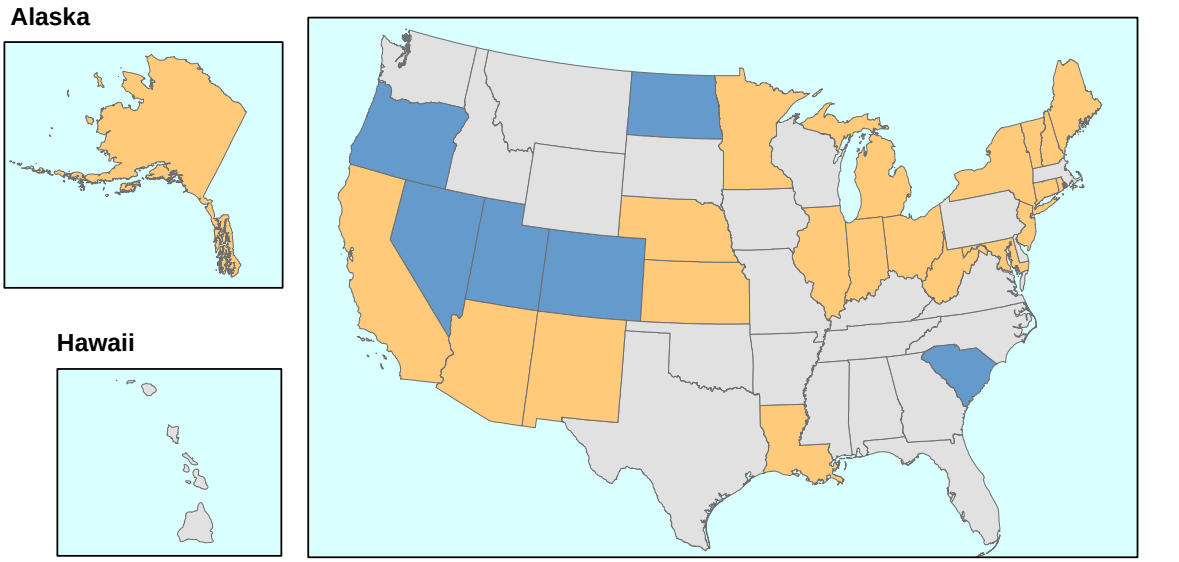

Alaska
Hawaii
Ratio of Actual to Expected Number of Workers with Some College or Associate Degree
Ratio
Under 100 percent
100 to 110 percent
110 to 125 percent

Map 5



Percentage Change in Average Annual Post-Secondary Educational Completions in Selected Program Areas, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Map 6



Net Domestic Migration Rate for Residents with Some College/Associate's Degree (2011-13)

4.4 Correlating the Middle Skills Indicators

Assuming that our middle-skills indicators are truly capturing variation in a skills gap by state, the variations should follow some sort of logical pattern. In particular, we pose the following hypotheses:

- States with greater losses or slower growth in middle skill jobs should have a larger pool of available middle skill workers and a smaller skills gap.
- States adding middle skill jobs rapidly should have a tighter supply of middle skill workers and a larger skills gap.
- States with larger middle skills gap should be seeing increased in-migration of middle-educated workers.
- States with greater middle skills gap should be seeing increased enrollment rates in post-secondary educational programs.

We ran a correlation analysis on six middle-skills indicators to determine if patterns are evident in the variations across the states. The results were underwhelming. Although our two ostensible skills gap measures (R1 and R2) correlated strongly and positively with each other, neither skills gap measure correlated meaningfully with rates of recent middle skill job change, net migration rates of middle-educated workers, or rates of change in post-secondary educational program completions in key middle skill areas. The correlation results are presented in Table 4. Correlation values below 0.40 percent are generally considered to be weak.

Table 4

	M1: Ratio of middle-educated workers to middle skill jobs	*M2: Ratio of actual to expected middle-educated workers*
R1 - ratio middle-educated workers to middle skill jobs	1.00	
R2 - ratio actual to expected middle-educated workers	.87	1.00
% change lower middle skill jobs 2007-13	(.24)	(.05)
% change upper middle skill jobs 2007-13	(.09)	(.04)
% change gap completions pre and post- recession	.25	.19
Net migration rate of residents w/some college	(.06)	(.01)

SECTION 5: CAUTIONS AND CONCLUSIONS

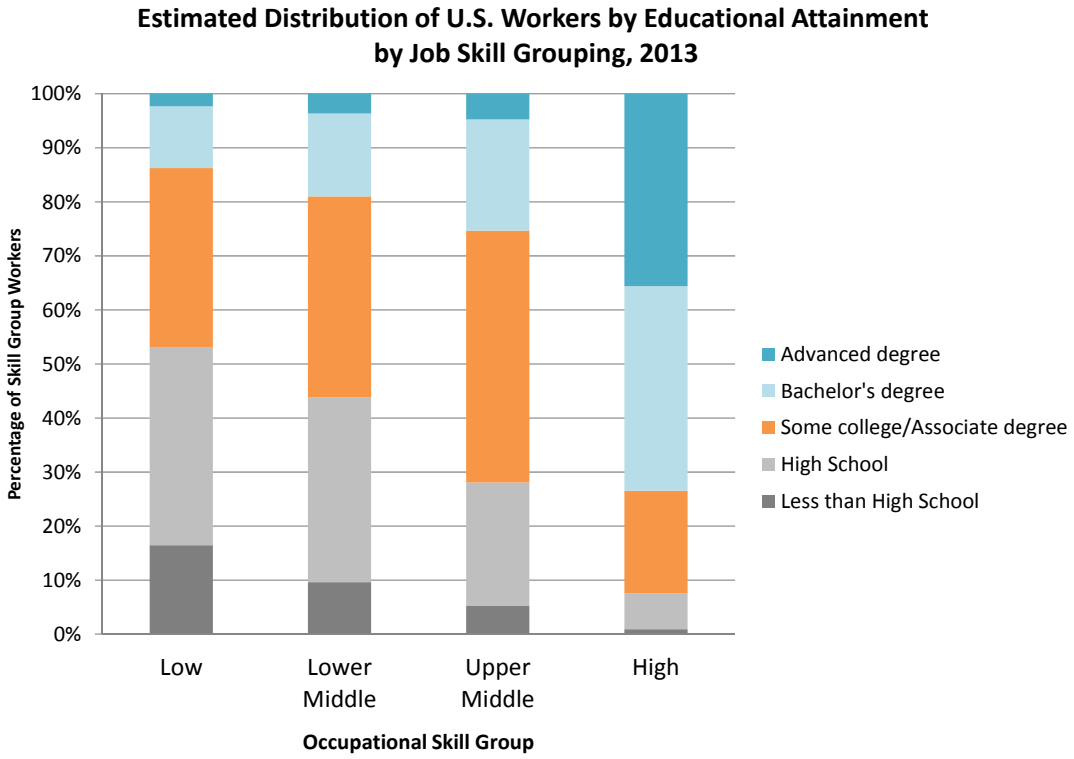
5.1 LIMITATIONS OF ANALYSIS USING SECONDARY DATA

Not all workers match the "typical" education profile of their occupation.
Middle skill job tabulations that rely on occupational employment statistics generally require an assumption that workers within a given occupation conform to a standard educational profile. National staffing patterns data from BLS suggest a more complicated picture of the workforce, as Table 3 demonstrated for welding-related occupations. While the typical welding job in the U.S. requires a high school diploma, nearly 23 percent of U.S. welders have less than a high school education and 28 percent have at least some college experience.

Analysis of BLS data reveals that nearly half of low skill jobs, many of which require less than a high school diploma, are filled by workers with post-secondary educational attainment. Conversely, about one quarter of the nation's high skill jobs are staffed by people with less than a bachelor's degree. Workers who fit the typical educational profile for middle skill occupations account for fewer than half of all workers in middle skill jobs (see Figure 2). As a consequence, we can't necessarily infer aggregate educational requirements from statewide occupational distributions.

Educational attainment is a weak proxy for worker skills.
Available secondary data on educational attainment fails to describe the skills of workers who may have extensive training or related work experience but no formal education beyond high school. Still, many studies including this one compare certificate or degree completions against specific occupations even though many occupations can be staffed by a range of people with apprenticeships, on-the-job training, or through incremental skill building within a firm. Without better metrics, by relying only on educational completions, one would actually expect on-paper supply shortages relative to occupational demands. Accordingly, when analyzing existing (and projected) skills gaps one needs a broader measure of worker supply than degree or certificate completion.

Figure 2



Current employment levels are not the same as worker demand.
Employment statistics count the number of jobs that are currently filled rather than the number of workers demanded by employers. Consequently, job counts are more reflective of demand that has already been satisfied. Skills "gap" is a misleading and insulting label for the difference between current employment levels and the number of people with some desired trait because it suggests the current employees are unqualified for the positions they hold.

Occupational employment change does not equate to skill demand change.
The integration of new technologies by firms requires new skill acquisition by their current and future workers. Such technology changes may outpace official occupational classifications. In a recent redefinition of the Standard Occupational Classification system, 453 out of the system's 840 detailed occupations had definition changes, and many of those definitions were edited to account for changes in technology. Consequently, occupational employment changes and projections based on today's definitions may fail to capture changes in the skill types and levels that are being demanded of workers.

5.2 CONCLUSIONS

Following are key findings from our analysis of state and national occupational employment and educational attainment data:

- Employment changes from 2007-2013 suggest evidence of shifting among so-called middle skill occupations in the U.S., with more rapid growth occurring in occupations that require higher levels of educational attainment.
- Overall, middle skill jobs have not demonstrably increased their share of the U.S. economy in recent years. Gains in jobs that require some post-secondary education below a bachelor's degree could not offset losses in jobs that require just a high school diploma with moderate or long-term training or related work experience.
- Iowa fared better than the U.S. in rates of lower middle skill job loss and upper middle skill job gains from 2007-13.
- For every 100 middle skill jobs in Iowa, including those requiring no formal post-secondary education, Iowa has approximately 95 workers with some education beyond high school but below a bachelor's degree, referred to in this study as middle-educated workers. The national average ratio was also 95 middle-educated workers per 100 jobs.
- Given its occupational structure, Iowa's supply of middle-educated workers is about ten percent higher than expected based on the typical educational attainment of U.S. workers in the same occupations.
- Iowa slightly exceeded national average growth rates in post-secondary educational program completions in a set of technology areas related to middle skill occupations.
- Net domestic in-migration has increased Iowa's supply of middle-educated workers by about two tenths of one percent per year from 2010-13.
- No meaningful correlations existed between state-level indicators of middle skills gap, rates of middle skill job change, post-secondary completions, and net migration of middle-educated workers.

This research demonstrates the limitations of using educational attainment and occupational employment statistics to measure the skill content of the workforce. Although relatively easy to construct, such measures appear to contribute information of little value for policy purposes. We conclude that producing credible evidence of a middle skills gap requires analytical and definitional-specificity that is simply not possible using state or regional secondary data.

BIBLIOGRAPHY

Deloite and The Manufacturing Institute. 2011. Boiling Point? The Skills Gap in U.S. Manufacturing

Deloite and The Manufacturing Institute. 2015. The Skills Gap in U.S. Manufacturing 2015 and Beyond

National Center for Education Statistics. 2014. Digest of Education Statistics, U.S. Department of Education.

Bridgeland, John, Jessica Milano, and Elyse Roseblum. 2011. Across the Great Divide: Perspectives of CEOs and College Presidents on America's Higher Education and Skills Gap. Civic Enterprises / Corporate Voices for Working Families.

Şahin, Ayşegül, Joseph Song, Georgio Topa, and Giovanni L. Violante. 2012. Mismatch Unemployment. Working paper. Federal Reserve Bank of New York.

Lazear, Edward P. and James R. Spletzer. 2012. The United States Labor Market: Status Quo or a New Normal? Working Paper #18386. National Bureau of Economic Research.

Elsby, Michael, Bart Hobijn, Ayşegül Şahin, and Robert G. Valletta. 2011. The Labor Market in the Great Recession: An Update. Brookings Papers on Economic Activity.

Autor, David. 2010. The Polarization of Job Opportunities in the U.S. Labor Market. The Hamilton Project and the Center for American Progress.

Jaimovich, Nir and Henry E. Siu. 2012. The Trend Is the Cycle: Job Polarization and Jobless Recoveries. Working Paper #18334. National Bureau of Economic Research.

Osterman, Paul and Andrew Weaver. 2014. Why Claims of Skills Shortages in Manufacturing are Overblown. Report on Trade and Globalization. Economic Policy Institute.

Bivens, Josh and Heidi Shierholz. Lagging Demand, Not Unemployability, is Why Long-Term Unemployment Remains So High. EPI Briefing Paper. Economic Policy Institute.

APPENDIX: POST-SECONDARY EDUCATIONAL PROGRAM COMPLETIONS

Data from the National Center for Education Statistics Integrated Post-Secondary Educational Data System (IPEDS) were compiled at the state level to examine recent patterns of change in the number and type of educational program completions below the bachelor's degree level. Average annual completions at all institutions in each state were calculated for two different time periods: pre-recession (2005-2007) and post-recession (2011-2013). In addition to the average for all programs under 4 years, we also calculated averages for a subset of program areas deemed relevant to a discussion of middle skills. Following are the specific program areas selected:

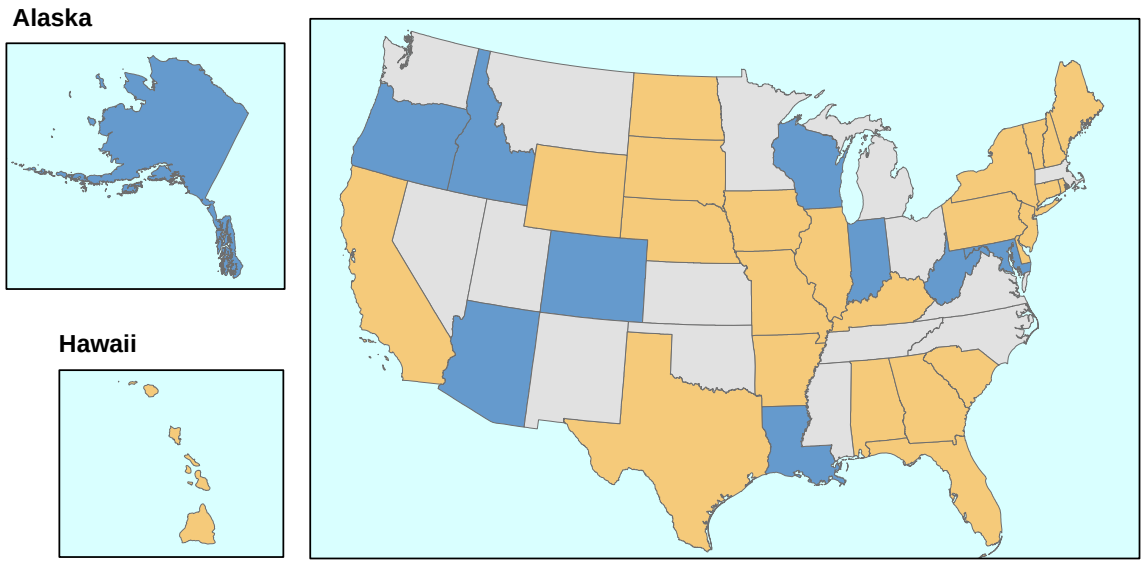
MIDDLE SKILLS PROGRAM AREAS

- Computer and information sciences and support services
- Engineering technologies and engineering-related fields
- Construction trades
- Mechanic and repair technologies and technicians
- Precision production
- Transportation and materials moving
- Health professions and related programs
- Business, management, marketing, and related support services

Maps 9-14 show state-level percentage changes in completions for the program groupings listed above. Map 15 shows the growth in completions for all programs under 4 years, including the middle skills program areas and all other program areas.

Compared to U.S. averages, Iowa saw faster growth in mechanic and repair technologies and technicians; precision production; transportation and materials moving; and business, management, marketing, and related support services. Iowa had slower growth in computer and information sciences and support services; engineering technologies and engineering-related fields; construction trades; and health professions and related programs. Iowa also grew more slowly in the overall rate of completions in post-secondary educational programs below the bachelor's level.

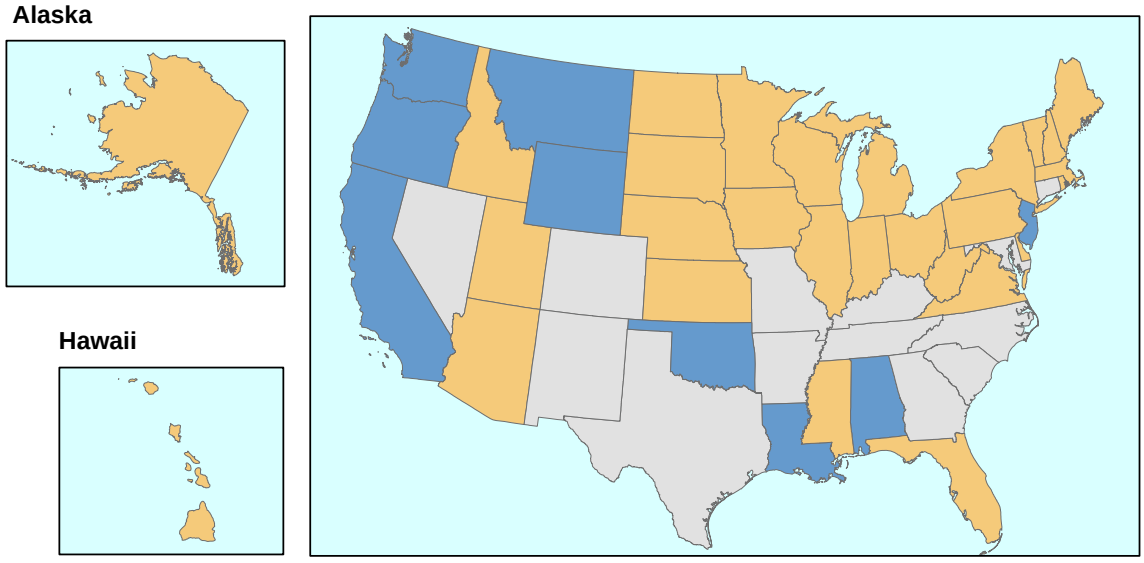
Map 7



Percentage Change in Average Annual Post-Secondary Educational Completions in Computer-Related Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Below 31 percent (U.S. average)
31 to 62 percent
Above 62 percent

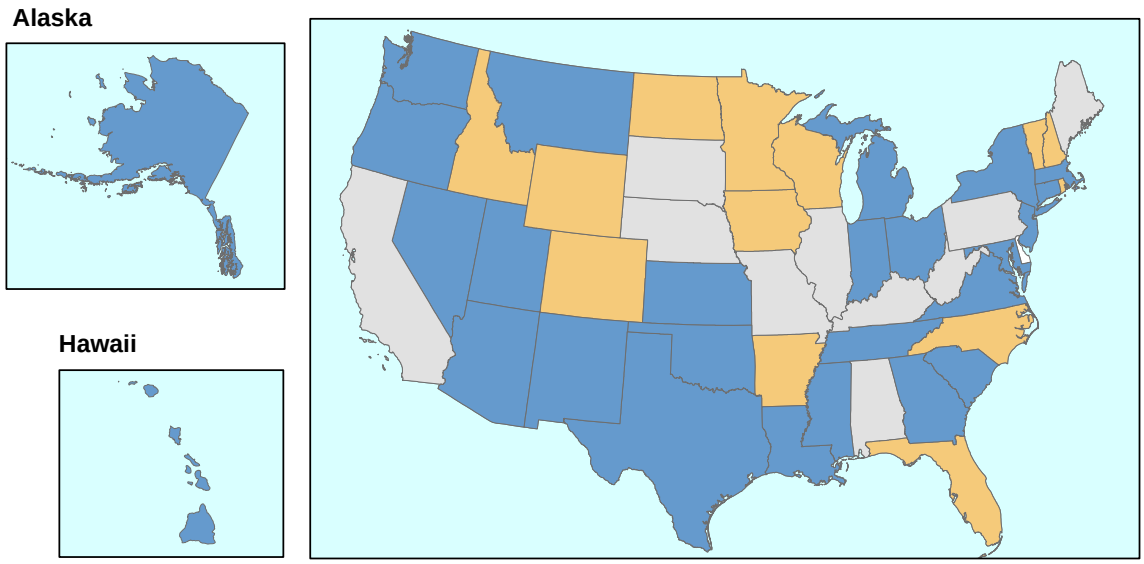
Map 8



Percentage Change in Average Annual Post-Secondary Educational Completions in Engineering-Related Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

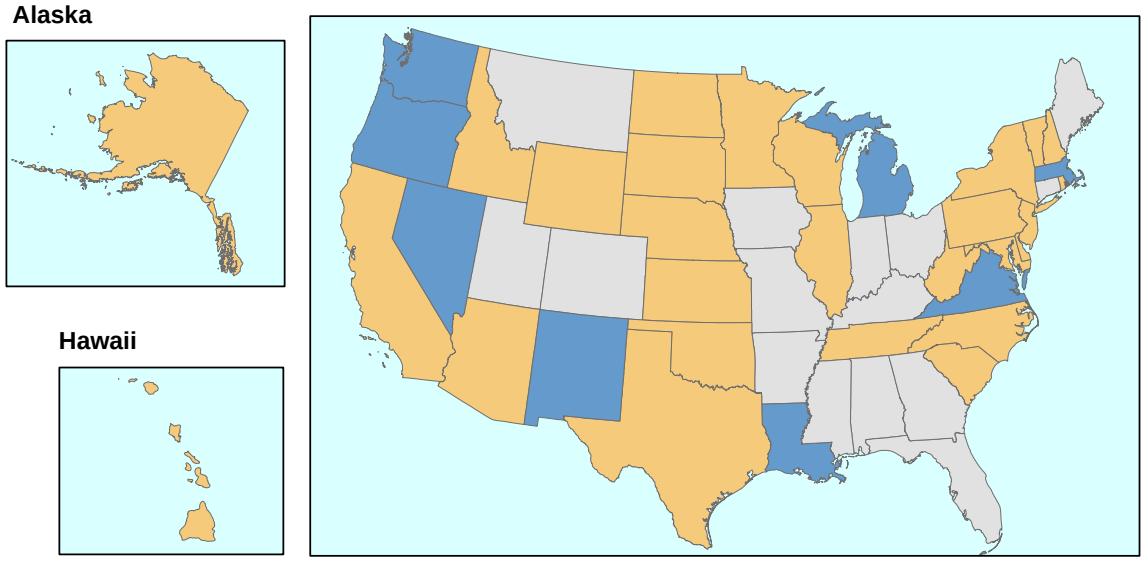
Below 40 percent (U.S. average)
40 to 80 percent
Above 80 percent

Map 9



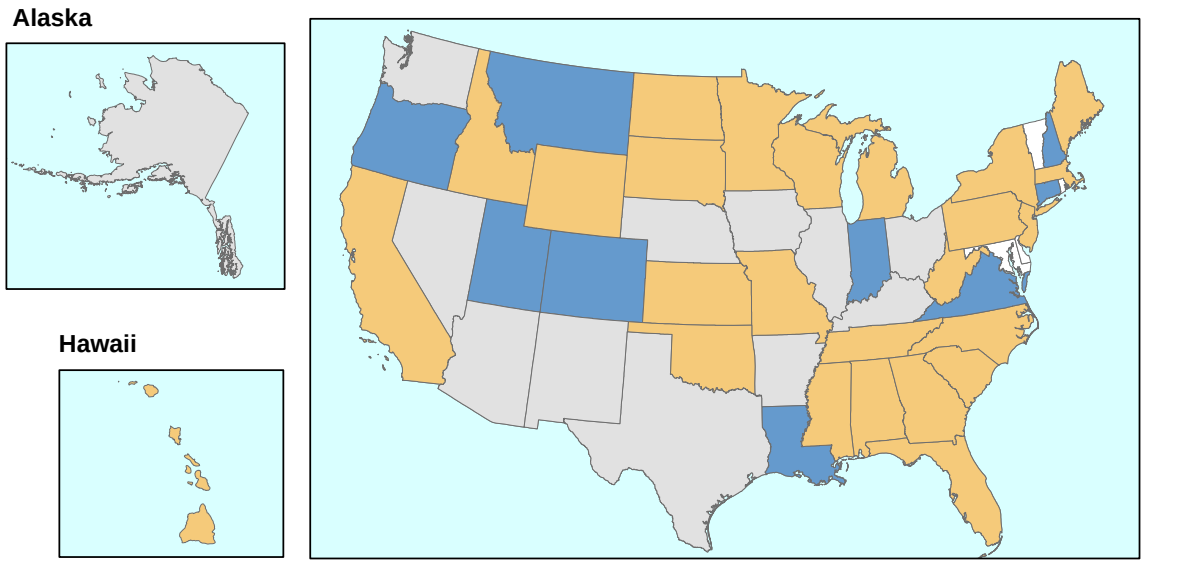
Percentage Change in Average Annual Post-Secondary Educational Completions in Construction Trades Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Map 10



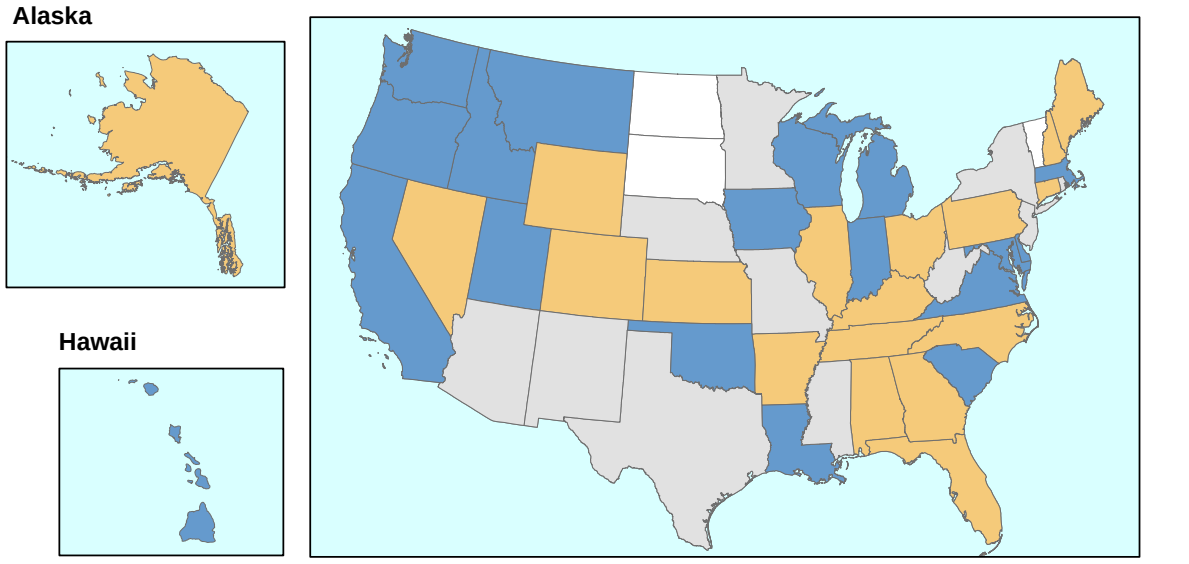
Percentage Change in Average Annual Post-Secondary Educational Completions in Mechanic/Repair Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Map 11



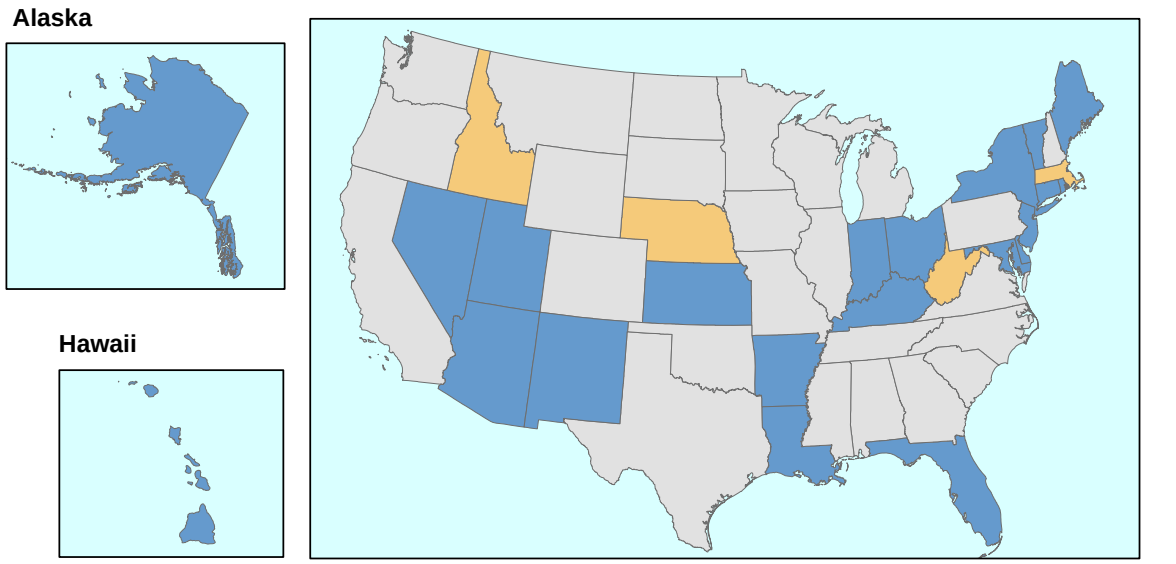
Percentage Change in Average Annual Post-Secondary Educational Completions in Precision Production, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Map 12



Percentage Change in Average Annual Post-Secondary Educational Completions in Transportation-Related Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

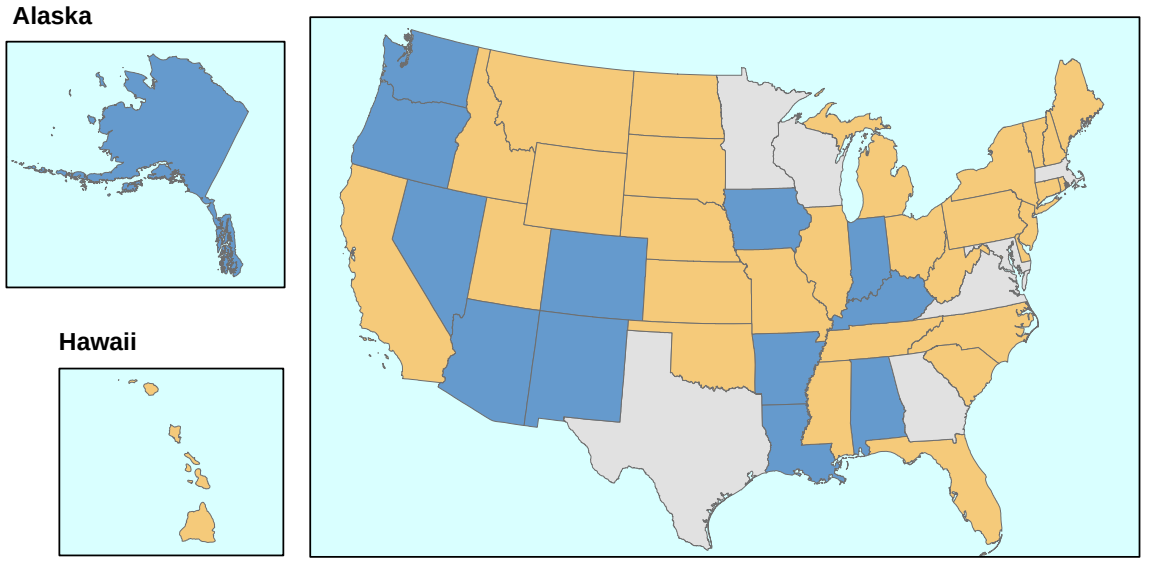
Map 13



Percentage Change in Average Annual Post-Secondary Educational Completions in Health & Related Professions, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Below 26 percent (half of U.S. average)
26 to 52 percent
Above 52 percent

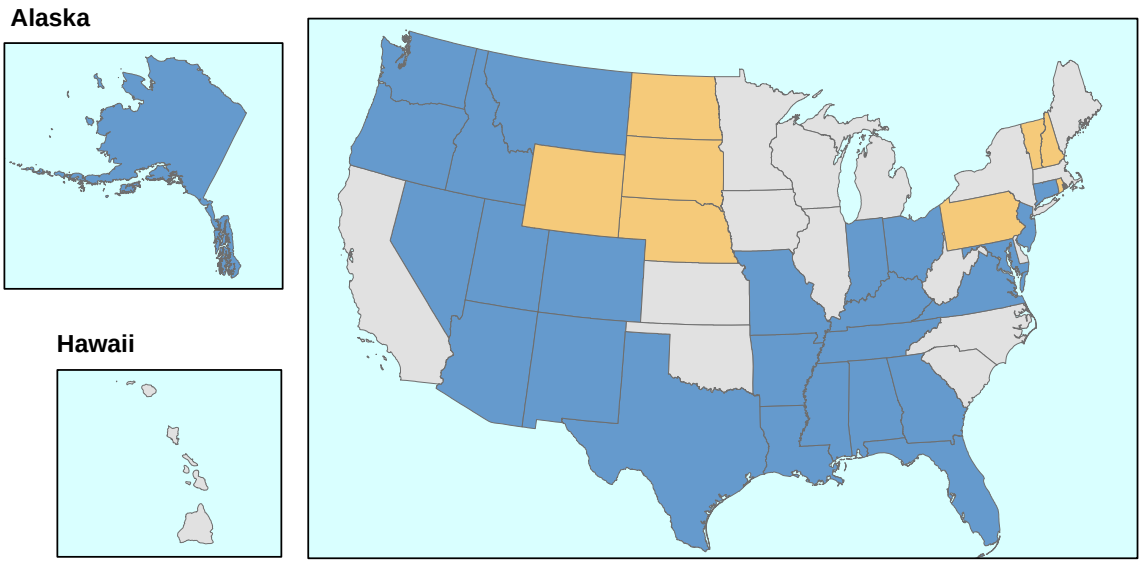
Map 14



Percentage Change in Average Annual Post-Secondary Educational Completions in Business-Related Programs, Pre-Recession (2005-2007) to Post-Recession (2011-2013)

Below 23 percent (U.S. average)
23 to 46 percent
Above 46 percent

Map 15



Percentage Change in Average Annual Post-Secondary Educational Completions in All Programs <4YRS, Pre-Recession (2005-2007) to Post-Recession (2011-2013)