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A Careful Analysis of Oregon's Middle-Skill Jobs

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Executive Summary

The Oregon version of a 2007 national report, "America's Forgotten Middle-Skill Jobs," estimated that 52 percent of Oregon's jobs were middle skill. Middle-skill jobs were defined as those requiring education beyond high school, but less than a four-year degree. This report prompted much discussion, both in terms of methodology and of policy, at the time it was released.

Recently, following the release of new 2010 to 2020 employment projections, staff at the Oregon Employment Department's Research Division were asked to review and update their analysis of the previous report and of middle-skill jobs in general.

The "America's Forgotten Middle-Skill Jobs" methodology grouped all jobs into just 10 broad occupational groups, then assigned an estimated education/skill level to each group based on incumbent education levels. This meant that widely different individual occupations were assigned to a single education/skill level.

However, Oregon Employment Department staff believe that a much better approach is to analyze the education requirements of each individual occupation. This comes much closer to focusing on the actual education required for an actual job.

<u>The Takeaway Message:</u>

- In terms of minimum education requirements, middle-skill occupations account for about 12 percent of Oregon's total projected job openings, high-skill occupations account for about 19 percent, and low-skill occupations account for the rest.
- Focusing on competitive requirements, middle-skill occupations account for 28 percent of total openings, high-skill occupations account for 26 percent, and low-skill occupations account for the remaining 46 percent.
- Where possible, OED recommends that analysis of occupations start at the detailed occupation level and be based on the actual education requirements for jobs.

Occupational Data – Sources and Caveats

The Oregon Employment Department (OED) works in partnership with the U.S. Department of Labor's Bureau of Labor Statistics (BLS) to produce occupational employment and wage statistics through the Occupational Employment Statistics (OES) Survey. Data are collected in the same way for states and the nation – with a sample of employers reporting how many workers they employ in different occupational categories, as well as the wages paid to those employees. Staff at OED code survey responses according to a national framework, so occupational data for Oregon are comparable with data for other states and the nation.

Every year, BLS publishes estimates of Oregon employment by occupation and OED publishes occupational wages. Every other year, Oregon economists produce employment estimates and forecasts for Oregon's industries and occupations. These OED and BLS data are the sources for the figures discussed throughout this paper.

BLS also assigns a typical education path to entry for each occupation using educational attainment information from the American Community Survey, and information obtained from educators, employers, incumbents, training experts, and professional and trade association representatives. OED staff assigns educational requirements to each occupation for Oregon using the national assignment as a starting point, then adjusts them using requirements listed in Oregon job announcements, programs of study offered in Oregon, and Oregon licenses.

In addition to the entry, or minimum, education level, OED staff also identifies a competitive education level – an estimate of the level that would make an individual more competitive (and more successful) in the labor market. Put another way, the competitive education requirement might reflect the level of education an employer would ideally like their job applicants to have. Both the minimum and competitive levels fluctuate with the business cycle. In times of economic growth, employers may accept job seekers who have the minimum education level for an occupation. During an economic downturn or slow growth period, when there are more job seekers with higher levels of education, employers tend to lean towards the competitive education level when looking for new hires.

For purposes of policy making and planning, we have long recommended that Oregon's decision-makers focus mostly on the competitive education requirements. It seems reasonable to strive towards having excellently qualified workers, not just minimally qualified ones.

The nation's occupational classification system used to collect and report occupational information, including educational requirements, classifies the nearly two million jobs in Oregon's economy into about 800 specific occupational categories. Some of these categories contain occupations that may have slightly different educational requirements, so the education levels are assigned by OED staff based on what is expected for most of the jobs in each occupational category.

The National Report and Broad Occupational Groups

In the national report “America’s Forgotten Middle-Skill Jobs,” middle-skill occupations are defined as those that require more than high school, but less than a four-year degree. That’s a fairly straightforward definition, and one that we will continue to use throughout this analysis.

One of our two concerns with that national report, and with its Oregon counterpart, is that much of the data analysis relies on compiling employment and projections numbers for major Standard Occupational Classification (SOC) groupings and categorizing the employment and projected job openings for those groups as low, middle or high skill. That is, Oregon’s almost two million jobs are grouped into just 10 broad occupational groups, and assumptions are made about the educational requirement for each of those groups as a whole.

In reality, though, a review of educational attainment in 2010 (Table 1) shows that even moving to the next level of detail supports this concern. Table 1 shows education levels of current workers in 22 occupation groups nationally. The education levels for detailed occupations within a group can vary widely, making occupation groups an unreliable

Table 1

Educational Attainment of U.S. Population 25 and Over by Occupation, 2010

	HS Diploma or Less	Postsecondary to Associate	Bachelor's or Higher
Group 1 "High Skill"	*11%*	*26%*	*63%*
Management Occupations	19%	29%	52%
Business and Financial Operations Occupations	11%	26%	63%
Computer and Mathematical Science Occupations	7%	28%	65%
Architecture and Engineering Occupations	9%	26%	65%
Life, Physical, and Social Science Occupations	5%	12%	83%
Community and Social Service Occupations	9%	19%	72%
Legal Occupations	6%	16%	78%
Education, Training, and Library Occupations	7%	15%	79%
Arts, Design, Entertainment, Sports, and Media Occupations	13%	28%	59%
Healthcare Practitioner and Technical Occupations	7%	37%	56%
Group 2 "Middle Skill"	*49%*	*35%*	*16%*
Sales and Related Occupations	35%	35%	29%
Office and Administrative Support Occupations	36%	44%	19%
Construction and Extraction Occupations	68%	26%	6%
Installation, Maintenance, and Repair Occupations	54%	39%	7%
Production Occupations	65%	28%	7%
Transportation and Material Moving Occupations	65%	27%	8%
Group 3 "Low Skill"	*56%*	*32%*	*11%*
Healthcare Support Occupations	44%	46%	10%
Protective Service Occupations	30%	47%	23%
Food Preparation and Serving Related Occupations	62%	29%	9%
Building and Grounds Cleaning and Maintenance Workers	73%	21%	6%
Personal Care and Service Occupations	48%	36%	15%
Farming, Fishing, and Forestry Occupations	80%	14%	6%

Source: US Census Bureau American Community Survey, 2010

proxy for skill level. For example, why would construction and extraction occupations – where seven out of 10 workers have a high school diploma or less – be considered **middle** skill, while protective service occupations – where 47 percent meet the given definition of middle skill, and another 23 percent have a bachelor's or higher degree – be considered **low** skill?

Required Education Levels

Our second concern is that the national study used analysis of the educational attainment of current workers as the method of determining the actual education requirements for each occupational group.

We believe it's more relevant – for purposes of workforce and training planning – to look at the actual educational requirements of each job, rather than the education level of current incumbents.

One way to test these groupings is to look at the education required (not the education that current incumbents happen to have) for jobs in these groups,

Table 2

Total Openings by Major SOC Group and Minimum Education Required

	HS Diploma or Less	Postsecondary to Associate	Bachelor's or Higher
Management, Business, and Financial	8%	4%	88%
Professional and Related	12%	31%	57%
Group 1 "High Skill"	*11%*	*23%*	*66%*
Sales and Related	91%	7%	2%
Office and Administrative Support	92%	8%	0%
Construction and Extraction	100%	0%	0%
Installation, Maintenance, and Repair	70%	30%	0%
Production	98%	2%	0%
Transportation and Material Moving	81%	19%	0%
Group 2 "Middle Skill"	*90%*	*10%*	*1%*
Service	96%	4%	0%
Farming, Fishing, and Forestry	100%	0%	0%
Group 3 "Low Skill"	*97%*	*3%*	*0%*

2010 Employment by Major SOC Group and Minimum Education Required

	HS Diploma or Less	Postsecondary to Associate	Bachelor's or Higher
Management, Business, and Financial	9%	4%	86%
Professional and Related	12%	28%	60%
Group 1 "High Skill"	*11%*	*21%*	*68%*
Sales and Related	88%	10%	2%
Office and Administrative Support	89%	11%	0%
Construction and Extraction	100%	0%	0%
Installation, Maintenance, and Repair	71%	29%	0%
Production	98%	2%	0%
Transportation and Material Moving	81%	19%	0%
Group 2 "Middle Skill"	*88%*	*11%*	*0%*
Service	95%	5%	0%
Farming, Fishing, and Forestry	100%	0%	0%
Group 3 "Low Skill"	*96%*	*4%*	*0%*

based on the given definition of low, middle and high skill (Table 2). Such a test shows that 21 percent of employment characterized in the national report as “high skill” requires more than high school but less than a four-year degree (the given definition of a middle skill job) and another 11 percent requires a high school diploma or less. For the occupations characterized in the report as middle skill, 88 percent of jobs in 2010 required a high school diploma or less, and only 11 percent require more than a high school diploma but less than a four-year degree. The idea that middle-skill jobs or job openings, by this definition, make up a significant share of the economy is difficult to back up with labor market data.

Let’s look at an example, the first table in the report “Oregon’s Forgotten Middle-Skill Jobs.” Table 3 is an updated snapshot of Oregon employment using the national method, which uses occupational groups as a proxy for skill groups. This table shows that 47 percent of Oregon’s jobs in 2011 were in occupation groups categorized in the report as middle skill, which is stated as requiring more than a high school diploma, but less than a four-year degree. High-skill occupations by this method make up 31 percent of Oregon’s jobs. The low-skill group is the smallest in this method, at 21 percent.

Table 3

Oregon Jobs by Skill Level (National Method), 2011

	2011 Employment	**Percent**
Total All Occupations	**1,586,620**	**100%**
Management, Business, and Financial	149,620	9.4%
Professional and Related	347,760	21.9%
Group 1 "High Skill"	*497,380*	*31.3%*
Sales and Related	161,110	10.2%
Office and Administrative Support	254,080	16.0%
Construction and Extraction	55,920	3.5%
Installation, Maintenance, and Repair	58,520	3.7%
Production	103,970	6.6%
Transportation and Material Moving	117,970	7.4%
Group 2 "Middle Skill"	*751,570*	*47.4%*
Service	325,940	20.5%
Farming, Fishing, and Forestry	11,760	0.7%
Group 3 "Low Skill"	*337,700*	*21.3%*

Analyzing Individual Occupations

Since the OED and BLS produce education requirements by detailed occupation, another method – a preferable method, in our view – is readily available. It produces results which contrast sharply with what’s seen in Table 3.

In Table 4, the 2010 employment is broken out by the minimum education required at the detailed occupation level, and summed up to meet the given definitions of low, middle, and high skill. Here we see that 66 percent of Oregon's jobs actually meet the "low skill" definition, while 13 percent meet the middle skill definition, and 21 percent meet the high skill definition. Middle-skill jobs, by this definition, are actually the smallest group.

Table 4

Oregon Jobs by Skill Level (OED Method - Minimum Education), 2010

	2010 Employment	Percent
Total, All Occupations	**1,618,990**	**100%**
Doctorate or professional degree	21,203	1.3%
Master's degree	36,648	2.3%
Bachelor's degree	281,251	17.4%
Bachelor Degree or Higher "High Skill"	*339,102*	*20.9%*
Associate's degree	71,301	4.4%
Postsecondary non-degree award	135,127	8.3%
Postsecondary to Associate "Middle-Skill"	*206,428*	*12.8%*
High school diploma or equivalent	655,646	40.5%
None	417,814	25.8%
HS Diploma or Less "Low-Skill"	*1,073,460*	*66.3%*

A similar picture emerges looking at the education requirements of the job openings OED projects between 2010 and 2020. Here's the updated table using the "America's Forgotten Middle-Skill Jobs" method (Table 5). It shows that nearly half of the state's anticipated job openings over the decade are expected in the occupational groups

Table 5

Oregon Jobs and Total Job Openings by Skill Level (National Method), 2010-2020

	Employment		Job Openings	
	2010	2020	Number	Percent
Total, All Occupations	1,618,990	1,915,284	724,124	100%
Management, Business, and Financial	144,607	170,037	58,817	8.1%
Professional and Related	351,234	413,859	146,034	20.2%
Group 1 "High Skill"	*495,841*	*583,896*	*204,851*	*28.3%*
Sales and Related	171,558	197,757	82,101	11.3%
Office and Administrative Support	262,348	309,947	110,298	15.2%
Construction and Extraction	58,294	72,873	28,922	4.0%
Installation, Maintenance, and Repair	58,173	66,915	22,832	3.2%
Production	104,660	122,556	41,045	5.7%
Transportation and Material Moving	118,081	138,179	52,406	7.2%
Group 2 "Middle Skill"	*773,114*	*908,227*	*337,604*	*46.6%*
Service	311,133	377,984	163,221	22.5%
Farming, Fishing, and Forestry	38,902	45,177	18,448	2.5%
Group 3 "Low Skill"	*350,035*	*423,161*	*181,669*	*25.1%*

characterized in the report as “middle skill.” The rest of the openings are split somewhat evenly between the report’s “high skill” and “low skill” groups.

Using the education requirements OED and BLS produce at the detailed occupation level, summing them up to fit the report’s definition of skill groups, we get Table 6. In this snapshot, openings requiring a high school diploma or less account for 69 percent of Oregon’s anticipated job openings over the decade. Nineteen percent of openings require a bachelor’s or higher degree. Openings requiring more than high school, but less than a bachelor’s degree are 12 percent of the state’s anticipated openings between 2010 and 2020; once again the smallest group.

Table 6

Oregon Jobs and Total Job Openings by Skill Level (OED Method - Minimum Education), 2010-2020

	Employment		Openings	
	2010	2020	Number	Percent
Total, All Occupations	1,618,990	1,915,284	724,124	100%
Doctoral or professional degree	21,203	25,891	9,551	1.3%
Master's degree	36,648	43,358	14,304	2.0%
Bachelor's degree	281,251	327,262	112,972	15.6%
Bachelor Degree or Higher "High Skill"	*339,102*	*396,511*	*136,827*	*18.9%*
Associate's degree	71,301	87,417	32,554	4.5%
Postsecondary non-degree award	135,127	159,809	53,782	7.4%
Postsecondary to Associate "Middle-Skill"	*206,428*	*247,226*	*86,336*	*11.9%*
High school diploma or equivalent	655,646	772,614	280,683	38.8%
None	417,814	498,933	220,278	30.4%
HS Diploma or Less "Low-Skill"	*1,073,460*	*1,271,547*	*500,961*	*69.2%*

What Competitive Education Levels Show

This does not mean that middle-skill jobs are not important in Oregon’s economy.

As mentioned earlier, we believe that the competitive education level for jobs is more relevant, for purposes of workforce and training planning, than the minimum level. We know that higher levels of education will make workers more competitive for available jobs and most likely, more productive in those jobs. For this reason, OED produces “competitive” education requirements at the detailed occupation level as well (something BLS does not do nationally). Let’s look at what competitive education requirements can lend to this conversation.

First, you may notice the line showing jobs with “None” as an education requirement is missing from the following two tables. At the minimum level, one-quarter of Oregon’s

jobs in 2010 didn't require a worker to finish high school. This includes jobs such as waiter or waitress, laundry and dry cleaning workers, service station attendants and fork lift operators. On the competitive side, no occupation has this characterization. Why? Because we expect that no matter the field, completing high school (and beyond) makes a worker more competitive, more adaptable, and less vulnerable to economic cycles.

Oregon jobs analyzed by competitive education levels are more evenly spread across the skill groups (Table 7). More than two-fifths of Oregon jobs, even on a competitive basis, fall into the low-skill category (42%), requiring a high school diploma or equivalent. The middle-skill group is larger when looking at competitive requirements – at 30 percent of Oregon jobs. High-skill jobs by this definition (needing a bachelor's or higher degree) made up 28 percent of Oregon jobs in 2010.

Table 7

Oregon Jobs by Skill Level (OED Method - Competitive Education), 2010

	2010 Employment	Percent
Total, All Occupations	**1,618,990**	**100%**
Doctorate or professional degree	51,517	3.2%
Master's degree	116,756	7.2%
Bachelor's degree	286,924	17.7%
Bachelor Degree or Higher "High Skill"	*455,197*	*28.1%*
Associate's degree	169,858	10.5%
Postsecondary non-degree award	318,882	19.7%
Postsecondary to Associate "Middle-Skill"	*488,740*	*30.2%*
High school diploma or equivalent	675,053	41.7%
HS Diploma or Less "Low-Skill"	*675,053*	*41.7%*

The job openings anticipated between 2010 and 2020 show a similar pattern (Table 8). About 46 percent of Oregon's projected job openings have a competitive education level of a high school diploma or equivalent. About 28 percent fall into the middle-skill group, and the remaining 26 percent make up the high-skill category.

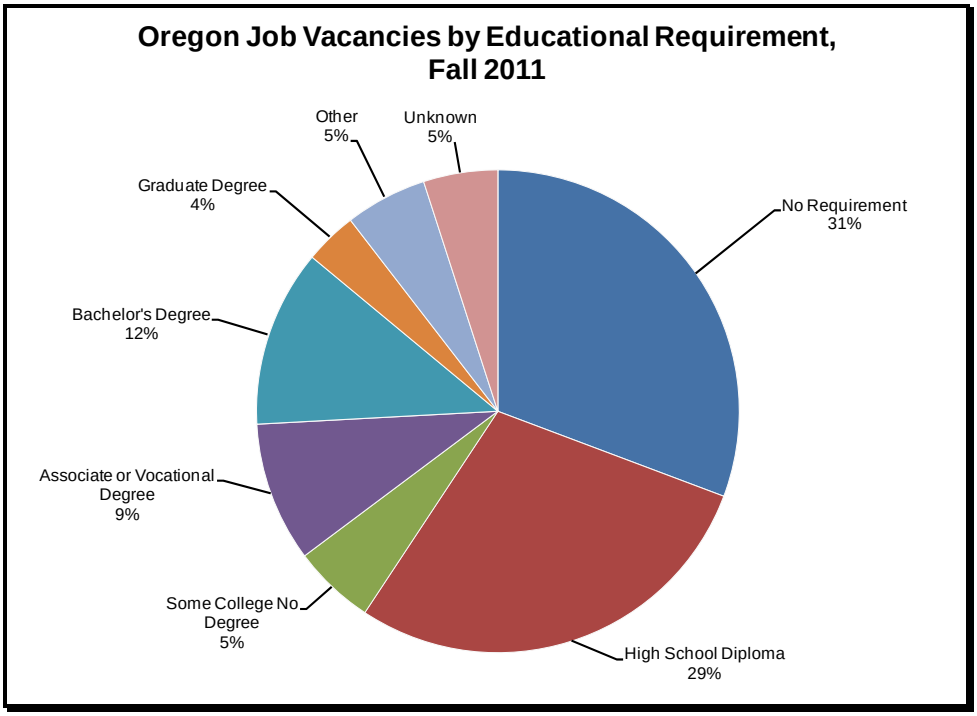
Another consideration to keep in mind is that many of the occupations classified as low skill in the OED method do contain specific jobs that require higher levels of training – the education requirement is set for the entire occupation based on what most of the jobs require. For example, registered nurses meet the definition of middle skill. These jobs have a minimum requirement of an associate degree. However, for specific job duties and career progression, many nurses need a higher level of training, even though they are grouped in an occupation where most jobs require an associate degree.

Table 8

Oregon Jobs and Total Job Openings by Skill Level (OED Method - Competitive Education), 2010-2020	Employment		Openings	
	2010	2020	Number	Percent
Total, All Occupations	1,618,990	1,915,284	724,124	100%
Doctoral or professional degree	51,517	61,476	20,575	2.8%
Master's degree	116,756	133,858	46,913	6.5%
Bachelor's degree	286,924	340,541	120,769	16.7%
Bachelor Degree or Higher "High Skill"	*455,197*	*535,875*	*188,257*	*26.0%*
Associate's degree	169,858	198,963	65,834	9.1%
Postsecondary non-degree award	318,882	383,250	138,187	19.1%
Postsecondary to Associate "Middle-Skill"	*488,740*	*582,213*	*204,021*	*28.2%*
High school diploma or equivalent	675,053	797,196	331,846	45.8%
HS Diploma or Less "Low-Skill"	*675,053*	*797,196*	*331,846*	*45.8%*

Another Source: Oregon Vacancy Survey

The OED and BLS occupational employment and projections data aren't the only source of information on what employers are looking for in their workers. OED also asks employers annually about the positions they're currently recruiting for, in the Oregon Vacancy Survey.



Graph 1

In the Fall 2011 Vacancy Survey, OED found that about 60 percent of employer reported vacancies had no education requirement or required a high school diploma. Vacancies requiring some college or an associate or vocational degree accounted for 14 percent of the total. This separate employer survey estimate is right in line with the projections data, though they are from completely different sources.

Is Education a Good Proxy for Skill Level?

One final comment: there's an additional weakness in both the national analysis and in our current analysis – the use of educational levels as a proxy for skill levels. In coming months, OED staff will be considering a new study, using detailed skills, by occupation, as an even more direct means to better understand the skill needs of Oregon's economy.

Concluding Comments

Middle-skill jobs are important to Oregon's economy. In many trades and fields, workers do not need a bachelor's degree to be relevant and successful in the workplace, but they do need more training than a high school diploma. Even in occupations that don't require formal training for entry, such training is often a good bet for a worker's continued progression through their career. Gaining skill is how workers set themselves apart in the job market, and at the individual level can lead to increased wages and job stability. That's an important message, and one that shouldn't get lost as we try to measure the impact of different levels of skill in the workforce.

Middle-skill jobs can be evaluated based on education levels attained by incumbents in each occupation, grouping like occupations, or by looking at the general level of education employers seek when hiring. Where possible, OED recommends that analysis of occupations start at the detailed occupation level. Beginning with detailed occupational data makes analysis relevant and actionable, encourages attention to occupations' individual needs, and is based on employer demand. This method should be considered a valuable and preferred alternative in evaluating the number of middle-skill jobs in the economy today and in the future.