A New Look at Education Requirements and Jobs

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BLS Employment Projections Background

- 10-year projections made every 2 years
  - First introduced in 1960
  - Most recent projections for 2010-2020
- Very detailed
  - 750 occupations and 300 industries
- BLS produces national projections
  - States produce state and area projections
How BLS makes Employment Projections

**Labor Force**
Total and by age, sex, race and ethnicity

**Aggregate Economy**
GDP, total employment, and major demand categories

**Occupational Employment**
Job openings due to growth & replacement needs

**Industry Final Demand**
Sales to consumers, businesses, government, and foreigners

**Industry Output**
Use and Make Relationships, Total Requirements Tables

**Industry Employment**
Labor productivity, average weekly hours, wage & salary employment

**Input-Output Tables**

- Population
  - Labor force participation rate trends

- Demographics
  - Fiscal policy
  - Foreign economies
  - Energy prices
  - Monetary policy

- Occupational Employment
  - Staffing patterns
  - Staffing pattern ratio analyses
  - Staff expertise
  - Replacement rates

- Industry Final Demand
  - Economic censuses
  - Annual economic surveys
  - Other data sources

- Industry Output
  - Input-Output Tables

- Industry Employment
  - Industry output
  - Sector wage rates
  - Technological change

- Economic censuses
  - Annual economic surveys
  - Other data sources
Major data sets used

- Population and labor force trends
  - Population by age, gender, race/ethnicity (Census)
  - Labor force participation rates (BLS)
- Macroeconomic data (BEA, et.al.)
- Industry trends
  - Output (BEA, Census)
  - Productivity (BLS)
  - Employment, hours, wages (BLS, Census)
Major data sets used

- Occupational Employment Statistics (OES) survey (BLS)
  - Occupational staffing patterns of industries
  - Basis for the National Employment Matrix
  - Wages for detailed occupations

- O*NET information (ETA)
  - Education and training
Some facts about the projections

- Includes all types of jobs
  - Wage and salary, self-employed, unpaid family workers; full-time and part-time
- Includes all industries and occupations
- Based on assumption of full employment in the target year (2020)
  - And other assumptions
  - All assumptions are published
Some facts about the projections

- For occupations, we show
  - Employment: 2010 and 2020 projected
  - Projected employment change (new jobs) for 2010-2020
  - Projected job openings for 2010-2020
    - New jobs plus replacement needs
How projections are used

- Career information and exploration
  - Students and their parents and counselors
  - Adult job seekers and career changers
  - BLS *Occupational Outlook Handbook*

- Education and training
  - Setting policy
  - Strategic planning and funding decisions
  - Program planning
  - Curriculum development
For both career exploration and policy decisions, users want to know:

- What is the demand for workers with a college degree (or some other level of education)?
- What training or experience is needed in different careers, in addition to formal education?
# Educational attainment by occupation

**Percent distribution of workers 25 years and older by educational attainment, by detailed occupation, 2009**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Less than high school diploma</th>
<th>High school diploma or equivalent</th>
<th>Some college, no degree</th>
<th>Associate's degree</th>
<th>Bachelor's degree</th>
<th>Master's degree</th>
<th>Doctoral or professional degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Services Managers</td>
<td>2.2</td>
<td>19.5</td>
<td>28.3</td>
<td>11.8</td>
<td>27.7</td>
<td>9.1</td>
<td>1.4</td>
</tr>
<tr>
<td>Lawyers</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.8</td>
<td>2.5</td>
<td>96.5</td>
</tr>
<tr>
<td>Paralegals and Legal Assistants</td>
<td>0.9</td>
<td>12.8</td>
<td>25.7</td>
<td>19.2</td>
<td>34.4</td>
<td>4.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Radio Operators</td>
<td>2.3</td>
<td>18.9</td>
<td>29.1</td>
<td>14.7</td>
<td>30.3</td>
<td>4.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Waiters and Waitresses</td>
<td>16.6</td>
<td>35.5</td>
<td>26.7</td>
<td>7.0</td>
<td>12.5</td>
<td>1.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Parking Lot Attendants</td>
<td>20.1</td>
<td>40.3</td>
<td>20.2</td>
<td>6.5</td>
<td>10.8</td>
<td>1.4</td>
<td>0.7</td>
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Three categories of information for each occupation:

- Typical education needed for entry
- Work experience in a related occupation
- Typical on-the-job training needed to attain competency in the occupation
## BLS Education and Training Categories

<table>
<thead>
<tr>
<th>Typical entry-level education</th>
<th>Work experience in a related occupation</th>
<th>Typical OJT needed to attain competency</th>
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<tr>
<td>Doctoral or professional degree</td>
<td>More than 5 years</td>
<td>Internship/residency</td>
</tr>
<tr>
<td>Master's degree</td>
<td>1 to 5 years</td>
<td>Apprenticeship</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>Less than 1 year</td>
<td>Long-term OJT (more than 1 year)</td>
</tr>
<tr>
<td>Associate's degree</td>
<td>None</td>
<td>Moderate-term OJT (1 to 12 months)</td>
</tr>
<tr>
<td>Postsecondary non-degree award</td>
<td></td>
<td>Short-term OJT (less than 1 month)</td>
</tr>
<tr>
<td>Some college, no degree</td>
<td></td>
<td>None</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
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- **Typical entry-level education:**
  - Doctoral or professional degree
  - Master's degree
  - Bachelor's degree
  - Associate's degree
  - Postsecondary non-degree award
  - Some college, no degree
  - High school diploma or equivalent
  - Less than high school

- **Work experience in a related occupation:**
  - More than 5 years
  - 1 to 5 years
  - Less than 1 year
  - None

- **Typical OJT needed to attain competency:**
  - Internship/residency
  - Apprenticeship
  - Long-term OJT (more than 1 year)
  - Moderate-term OJT (1 to 12 months)
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BLS Education and Training Categories

- Allows analysis of projections for occupations assigned to each category
  - Data summed for occupations found in each category
    - E.g., projected new jobs in occupations assigned bachelor’s degree as typical entry-level education

- Allows analysis at the intersections of typical entry-level education, work experience, and OJT
BLS Education and Training Categories

- Based on analyses of qualitative and quantitative information
  - ACS education attainment data
  - Education, work experience, and on-the-job training requirements data from O*NET
  - Qualitative information from educators, employers, workers in the occupation, training experts, and professional and trade associations and unions

- Do not depict multiple paths of entry
- Do not project change in entry requirements over time
## Employment by Typical Entry-level Education Category: 2010

<table>
<thead>
<tr>
<th>Education Category</th>
<th>Thousands of jobs</th>
<th>Median annual Wages, May 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral or professional degree</td>
<td>4,409.7</td>
<td>$87,500</td>
</tr>
<tr>
<td>Master's degree</td>
<td>1,986.0</td>
<td>$60,240</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>22,171.1</td>
<td>$63,430</td>
</tr>
<tr>
<td>Associate's degree</td>
<td>7,994.6</td>
<td>$61,590</td>
</tr>
<tr>
<td>Postsecondary non-degree award</td>
<td>6,524.0</td>
<td>$34,220</td>
</tr>
<tr>
<td>Some college, no degree</td>
<td>811.6</td>
<td>$44,350</td>
</tr>
<tr>
<td>High school diploma or equivalent</td>
<td>62,089.6</td>
<td>$34,180</td>
</tr>
<tr>
<td>Less than high school</td>
<td>37,081.7</td>
<td>$20,070</td>
</tr>
</tbody>
</table>
Percent Change in Employment by Typical Entry-level Education Category

Percent change, projected 2010-20

- Doctoral or professional degree: 19.9%
- Master's degree: 21.7%
- Bachelor's degree: 16.5%
- Associate's degree: 18.0%
- Postsecondary non-degree award: 16.9%
- Some college, no degree: 17.5%
- High school diploma or equivalent: 12.2%
- Less than high school: 14.1%

Average, all occupations = 14.3%
Employment Change by Typical Entry-level Education Category

Thousands of jobs, projected 2010-20

- Doctoral or professional degree: 876.6
- Master’s degree: 431.2
- Bachelor’s degree: 3,651.6
- Associate’s degree: 1,440.0
- Postsecondary non-degree award: 1,100.9
- Some college, no degree: 142.2
- High school diploma or equivalent: 7,576.1
- Less than high school: 5,245.7
Percent distribution of employment by typical entry-level education of occupation, projected 2020

- Doctoral or professional degree: 3.2%
- Master's degree: 1.5%
- Bachelor's degree: 25.9%
- Associate's degree: 15.8%
- Postsecondary non-degree award: 5.8%
- Some college, no degree: 4.7%
- High school diploma or equivalent: 0.6%
- Less than high school: 42.6%
Other approaches, different results

- A “computational” approach
  - Project change in education attainment of labor force
  - Apply projected change to education attainment distribution in each occupation
  - Apply projected education attainment distribution to projected employment in each occupation
  - Sum results by education attainment
Other approaches, different results

- Georgetown University, Center on Education and the Workforce, 2010
  - By 2018, 23 percent of jobs require Bachelor’s degree

- Urban Institute, Loprest & Mitchell, 2012
  - By 2017, 20.9 percent of jobs require Bachelor’s degree

- BLS
  - By 2020, 15.8 percent of jobs in occupations with Bachelor’s degree as typical entry-level education
Other approaches, different results

- Bachelor's or higher: 31.5% (Urban Institute, 2017), 33.1% (Georgetown University, 2018), 20.5% (BLS, 2020)
- Some postsecondary education: 29.2% (Urban Institute, 2017), 29.8% (Georgetown University, 2018), 11.1% (BLS, 2020)
- High school or less: 39.4% (Urban Institute, 2017), 37.1% (Georgetown University, 2018), 68.5% (BLS, 2020)
Other approaches, different results

Critical assumptions

- “..the present distribution of education among the employed prime-age population is the best single indicator of present demand for education.”
  *Georgetown CEW*

- "... We do not observe the educational level requirements of jobs, but the education level of those who are employed in the jobs.”
  *Urban Institute*

- "... that the education attained by the average U.S. worker for a given occupation indicates the years of education demanded by employers..”
  *Brookings Institution, Rothwell 2012*
Closing thoughts

- Policymakers need to understand the assumptions made in analysis used for high-stakes decisions.

- There is a gap in data about the connection between education and the labor market
  - ACS is the best data on education attainment by occupation
    - But ACS does not measure what employers require.
Contact Information

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