



# THE EDUCATIONAL ATTAINMENT OF THE WORKFORCE

**March 2016**

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**P<sup>3</sup> | PRODUCTIVITY AND  
PROSPERITY PROJECT**

**ASU** W. P. CAREY  
SCHOOL of BUSINESS  
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**A Report from the Productivity and Prosperity Project (P3),  
Supported by the Office of the University Economist**

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## SUMMARY

The educational attainment of the U.S. workforce has been steadily increasing. The gains have resulted from decreases in the share of the workforce with a maximum educational attainment of a high school diploma or less, offset by gains in the share with at least a bachelor's degree.

Arizona also has experienced gains in the educational attainment of its workforce, though the increases have not quite kept up with the nation. The educational attainment of Arizona's workforce remains below the nation and below the median of the states. Arizona has consistently had a larger share of workers without a high school diploma (fifth highest percentage in the nation in 2014) and a lesser share with a high school diploma as their maximum achievement. The share with some college (including an associate's degree) has consistently been above average, but the share with at least a bachelor's degree has been uniformly below average.

A number of states have set goals for postsecondary educational attainment; in some states, these goals have been passed by the state legislature. However, the exact nature of the goals vary widely by state. The age group to which the goal applies varies, in some states limited to the working-age population or a subset thereof. Some states include those earning a postsecondary certificate or other credential as part of the goal — though comprehensive data on the number of people earning such certificates or other credentials are not available. Other states limit the goal to those earning a degree (usually including associate's degrees).

In setting the goal, some states refer to a study produced by Georgetown University's Center on Education and Workforce that attempts to *project* the percentage of "jobs that will require some form of postsecondary education or training," nationally and by state. In reality, it is very difficult to accurately project employment by occupation, particularly at a state level. The broad definition used by Georgetown includes those who have attended college without earning a degree, certificate, or other credential. There is a large difference between this group — nearly 60 percent of Americans age 25 and older have attended college — and the group who have earned a college degree (only 38 percent nationally). While the percentage earning a postsecondary certificate or other credential is unknown, it is thought to be around 5 percent.

Arizona is considerably below the national average on the percentage of working-age adults with at least a bachelor's degree (27.6 versus 31.5 percent), but is slightly above the nation on the percentage with an associate's degree (9.1 versus 8.9 percent) and is considerably above the nation on the percentage who have attended college without earning a degree (25.9 versus 21.5 percent). On the broad measure used by Georgetown, Arizona is above the national average (62.6 versus 61.9 percent), but the state is below average on the percentage earning a degree (36.7 versus 40.4 percent).

Any goal set for Arizona should focus on the percentage earning at least a bachelor's degree since the state already is above average on lesser measures of postsecondary educational attainment. Further, the goal should be specific to the workforce, not the entire population; Arizona has a disproportionately high share of working-age adults with college degrees who have retired early. The goal also should be focused on increasing the educational attainment of young adults. It is unrealistic to expect a large number of older adults to enhance their educational attainment.

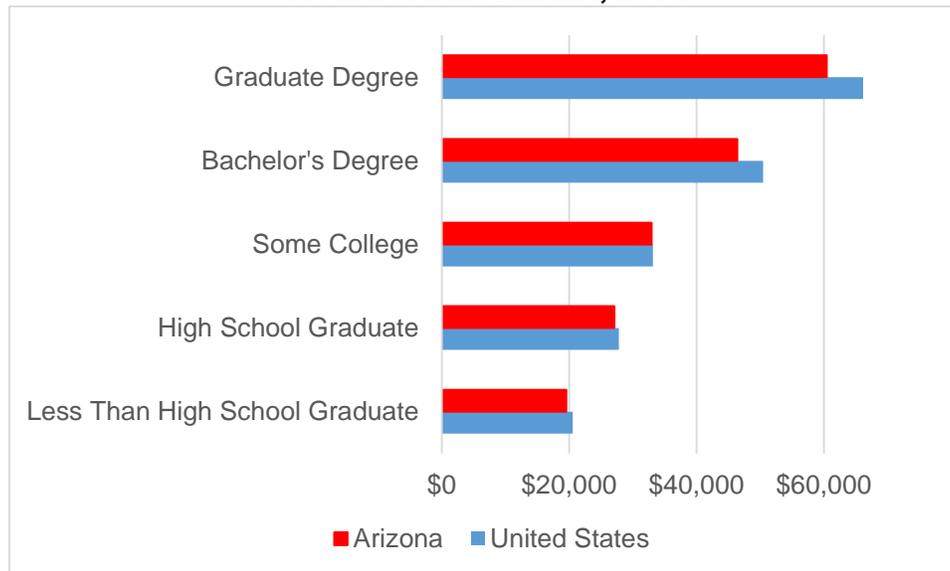
## INTRODUCTION

The most important economic development factor in the 21st century is the quality and availability of the workforce. Educational achievement and attainment are important aspects of labor force quality.

Earnings of working individuals are highly correlated to their educational attainment, as illustrated in Chart 1. Nationally in 2014, high school graduates earned 35 percent more than those with less education, those with some college (including an associate's degree) earned 19 percent more than those with only a high school diploma, those with a bachelor's degree earned 52 percent more than those with some college, and those with a graduate degree earned 31 percent more than those with a bachelor's degree. Among those with a maximum educational attainment of some college or less, median earnings in Arizona in 2014 were within 5 percent of the national average, but the differential was 8-to-9 percent among those with a bachelor's or graduate degree. Nationally, the overall median earnings figure in 2014 was \$36,129; Arizona's median was 6 percent less.

One of the functions of economic development is to balance the supply of, and demand for, workers. Moreover, economic development attempts to improve the education and skills of the workforce while attracting jobs that require workers to have substantial educations and skills — jobs that pay well. The spending of such high-earnings workers boosts the private-sector economy while the taxes paid by high earners supports public programs, including those integral to success in economic development.

**CHART 1  
MEDIAN EARNINGS BY EDUCATIONAL ATTAINMENT,  
AGE 25 AND OLDER, 2014**



Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table B20004, <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>.

The importance of education has been recognized in many states, which have set goals related to the educational attainment of their residents, as discussed in the next section of this paper. The remainder of this paper examines the educational attainment of the workforce, which provides insight into the quality of jobs. Job quality typically is defined in terms of wages or total compensation (including benefits). While a measure of job quality has been produced by the Office of the University Economist (see the reports at <https://economist.asu.edu/p3/job-quality>), the calculation of this measure is a laborious process; the most recent report was produced in 2006.

### **EDUCATIONAL ATTAINMENT GOALS**

The Lumina Foundation has set a goal that 60 percent of Americans obtain a high-quality postsecondary degree, certificate, or other credential by 2025 ([https://www.luminafoundation.org/goal\\_2025](https://www.luminafoundation.org/goal_2025)). They cite data that 40 percent of Americans between the ages of 25 and 64 currently have earned an associate's or higher degree. This 40 percent figure and the 60 percent goal, however, are not comparable, since the 40 percent figure does not include those who have earned a certificate or other credential. The number of Americans with such credentials is unknown, though the Lumina Foundation estimates that 7.8 million Americans (about 5 percent of those 25-to-64 years old) hold a certificate or credential. If so, then the current figure of 45 percent with a postsecondary degree, certificate, or other credential is far short of the 60 percent goal. The lack of data regarding the number holding a postsecondary certificate or other credential means that it will be impossible to accurately track progress toward the goal.

A number of states also have set educational attainment goals. In most cases, the goal is set for the year 2020 or 2025, but the similarities in the goals ends there. Some states express the goal similarly to the Lumina Foundation, as the percentage with at least a postsecondary certificate or degree. Others express the goal as those earning at least an associate's degree or those earning at least a bachelor's degree. The age group to which the goal applies often is unspecified or is simply "adults" but in other states an age range is specified, such as 25-to-34, 25-to-54, or 25-to-64. Instead of referring to the entire population, one state sets the goal specifically for those in the workforce.

In many states, the goal has been set by a higher education organization, such as the Board of Regents. In several states, however, the goal has been set by the state legislature, suggesting broader public support for the goal.

Most of the goals set by states (and the Lumina Foundation goal) are overly broad. The goals should be specific to those in the workforce, as in Texas. For example, Arizona and a few other states have above-average shares of early retirees (under the age of 65) who are not active in the workforce but who have earned university degrees. More generally, including retirees and others who are not part of the workforce is essentially irrelevant. A goal specific to young adults — Colorado, Georgia, Idaho, and Massachusetts have set such goals, generally specific to the 25-to-34 age group — is much more sensible than expecting that large numbers of older adults will enhance their educational attainments.

In setting the goal, some states refer to a study produced by Georgetown University's Center on Education and Workforce (<https://cew.georgetown.edu/>). The report "Recovery: Job Growth and Education Requirements Through 2020," was released in June 2013; it was an update of a report issued in 2010. In these reports, the percentage of "jobs that will require some form of postsecondary education or training" were *projected* nationally and by state. The projection for the nation made in the 2013 report is 65 percent in 2020 — 18 percent of jobs will require some college but no degree, 12 percent will require an associate's degree, 24 percent will require a bachelor's degree, and 11 percent will require a master's or higher degree. This is up from the 2010 projection of 63 percent in 2018.

Users of the Georgetown University study need to understand that their figures on the percentage of jobs requiring postsecondary education or training are forecasts based on occupational projections. It is very difficult to accurately project employment by occupation, particularly at a state level. State forecasts issued in 2013 are in some cases inconsistent with those issued in 2010.

Further, the Georgetown University study does not use terminology such as "postsecondary certificate or other credential." Instead, it uses the generic phrase "postsecondary education or training." This includes those who have attended college without earning a degree, certificate, or other credential. Thus, the Georgetown projection of 65 percent in 2020 is not comparable to the Lumina goal of 60 percent in 2025.

The 2013 Georgetown University study states that 60 percent of jobs as of that time required some form of postsecondary education or training. Thus, to meet the projected requirement, the share would need to rise 5 percentage points in seven years, an attainable goal given the existing upward trend in educational attainment. In contrast, an increase in the Lumina Foundation goal of approximately 15 percentage points by 2025 is more challenging.

The 2013 Georgetown University study projected that 68 percent of Arizona jobs in 2020 would require postsecondary education, higher than the national forecast of 65 percent. In contrast, in the 2010 study, the forecast for Arizona was 61 percent in 2018 — less than the 63 percent forecast for the national average. Neither of these inconsistent forecasts are in line with the actual figure in Arizona, which is approximately the same as the national average and has been changing at a pace slightly less than for the nation.

The only goal set in Arizona is one issued by the Board of Regents in 2013 related to 30 percent having at least a bachelor's degree. More recently, a broader goal has been discussed in Arizona, citing the Georgetown study. However, these discussions have confused the broad Georgetown definition of postsecondary education with a much more narrow measure of the percentage of degree holders (including associate's degrees). Thus, the comparison of the 68 percent projection by Georgetown University and the current 36-or-37 percent figure cited for degree holders is inappropriate. Further, the 68 percent projection issued by Georgetown likely is too high.

As discussed in the remainder of this report, Arizona is considerably below the national average on the percentage of working-age adults with at least a bachelor's degree, but is slightly above the nation on the percentage with an associate's degree and is considerably above the nation on

the percentage who have attended college without earning a degree. Thus, on the broad measure used by Georgetown University, Arizona is approximately equal to the national average. Any goal set for Arizona should focus on the percentage earning at least a bachelor's degree since the state already is above average on lesser measures of postsecondary educational attainment.

### **DATA SOURCES FOR THE EDUCATIONAL ATTAINMENT OF WORKERS**

Three sources of data on the educational attainment of the workforce were examined for this paper. Only one of these sources provides reliable data by state and it is limited to the 2005-to-2014 time period. The data from each source is confined to those aged 25 and older, the standard age for which educational attainment data are available. Maximum educational attainment is aggregated into four categories: not a high school graduate, high school graduate, some college (including an associate's degree), and a bachelor's degree or more. In addition to the four categories of educational attainment, an overall "score" was calculated for this paper by weighting the share of workers in each category (a weight of 1 for not a high school graduate, 2 for high school graduate, 3 for some college, and 4 for at least a bachelor's degree).

Two of the three sources are based on surveys. The Current Population Survey (CPS) provides reliable data for the nation, but not for states. The American Community Survey (ACS) is similar to the CPS but has a much larger sample size, allowing for reasonably reliable data to be produced by state. Each is a survey of households, with data collected for each individual living in the household. The data are expressed by place of residence. The questions related to workforce status, educational attainment, and age are nearly identical in the ACS and CPS.

The U.S. Bureau of Labor Statistics provides national CPS data on labor force statistics cross-tabulated by various demographic characteristics, including educational attainment (<http://stats.bls.gov/cps/demographics.htm>). Data on the employment status of the civilian population aged 25 and older cross-tabulated by educational attainment are available annually for the 1992-through-2015 period.

Annual data from the ACS are available for 2005 through 2014 from the U.S. Census Bureau's American FactFinder (<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>). The standard table from the ACS on educational attainment by employment status (Table B23006) differs from the CPS table by not including those 65 and older.

Other tables on educational attainment that are not specific to the workforce are available from the ACS. These tables provide much more detail on educational attainment for the population aged 25 and older and moderately more detail (particularly splitting associate's degrees from those with some college but no degree) for specific age groups, such as 25 through 34. However, information on postsecondary certificates or other credentials is not available.

A third source of information on workforce characteristics is the Quarterly Workforce Indicators (QWI) produced from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program. This program combines data on jobs with data on worker characteristics and firm characteristics. The result is much more detailed information than is available from other sources. In particular, instead of looking at the workforce in its entirety, the QWI produces data

specific to new hires, those who have lost their jobs, etc. In addition to this detail, an advantage of the QWI is that nearly all workers are included, rather than being based on a sample.

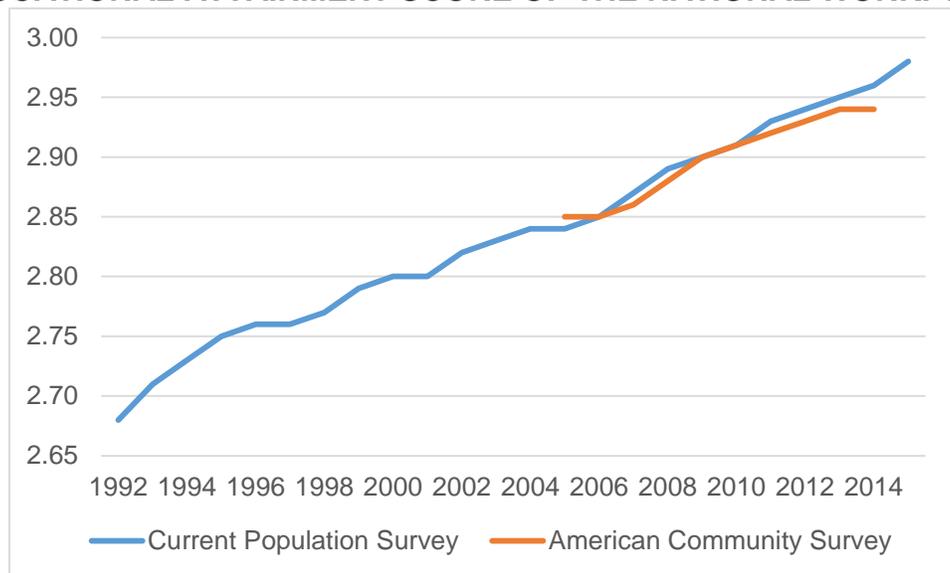
Unlike the CPS and ACS, which report information on individuals, the counts from the QWI are of jobs. For individuals who work more than one job, the results from the QWI differ from the surveys. In addition, the QWI data are expressed on a place-of-work basis instead of place of residence. For example, an individual who lives in Bullhead City, Arizona and works in Laughlin, Nevada is counted in Arizona in the CPS and ACS, but the job is counted in Nevada in the QWI.

One of the worker characteristics included in the QWI is educational attainment, but unlike the characteristics on age, sex, and race/ethnicity, the educational attainment data are highly derived and therefore subject to significant limitations. Indeed, workforce trends related to educational attainment from the QWI are inconsistent with the findings from the ACS and CPS. Thus, the QWI results are not discussed in this paper.

### **EDUCATIONAL ATTAINMENT OF THE NATIONAL WORKFORCE**

The educational attainment of the national workforce has been steadily rising for more than two decades. A time series of the educational attainment “score” of the national workforce is displayed in Chart 2. The small differences between the ACS and CPS scores likely result from the inclusion of retirement-age workers in the CPS measure, though timing differences (the CPS data are collected in March while the ACS data are collected throughout a calendar year) and sampling error also could contribute.

**CHART 2**  
**EDUCATIONAL ATTAINMENT SCORE OF THE NATIONAL WORKFORCE**



Sources: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey, <http://stats.bls.gov/webapps/legacy/cpsatab4.htm> and U.S. Department of Commerce, Census Bureau, American Community Survey, Table B23006, <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>.

The increases in the score result from decreases in the shares of the workforce with a maximum educational attainment of a high school diploma or less, offset by gains in the share with at least a bachelor's degree. The share with some college rose through 1995 but has hardly changed since then (see Chart 3).

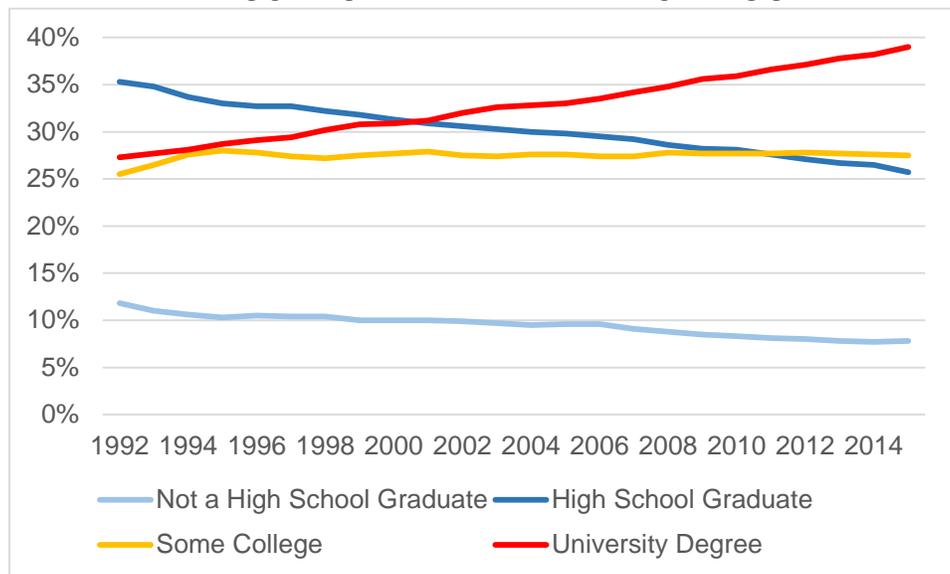
In 2015 according to the CPS, 7.8 percent of the workers at least 25 years old had not graduated from high school, 25.7 percent were high school graduates but had no further schooling, 27.5 percent had attended college but had not received a bachelor's degree, and 39.0 percent had earned at least a bachelor's degree. The ACS percentages, which do not include workers aged 65 and older, were somewhat different from the CPS shares in 2014, with higher shares without a high school diploma and with some college, offset by lower shares of high school graduates and university graduates.

The educational attainment of the workforce is higher than that of the entire population of the same age group. Among those 25-to-64 years of age, 62 percent of all individuals had some postsecondary education in 2014; the comparable figure for workers was 67 percent. In addition, the educational attainment of the working-age population (25 to 64) was higher than that of the entire population 25 and older: 62 percent of workers and 59 percent of all individuals had postsecondary education; 40 percent of workers and 38 percent of all individuals had earned associate's or higher degrees.

### EDUCATIONAL ATTAINMENT OF THE WORKFORCE BY STATE

Using ACS data, the educational attainment of the workforce in 2014, as measured by the score, was highest in the District of Columbia, followed by Massachusetts. Other states in the

**CHART 3  
SHARES OF THE NATIONAL WORKFORCE  
BY EDUCATIONAL ATTAINMENT CATEGORY**



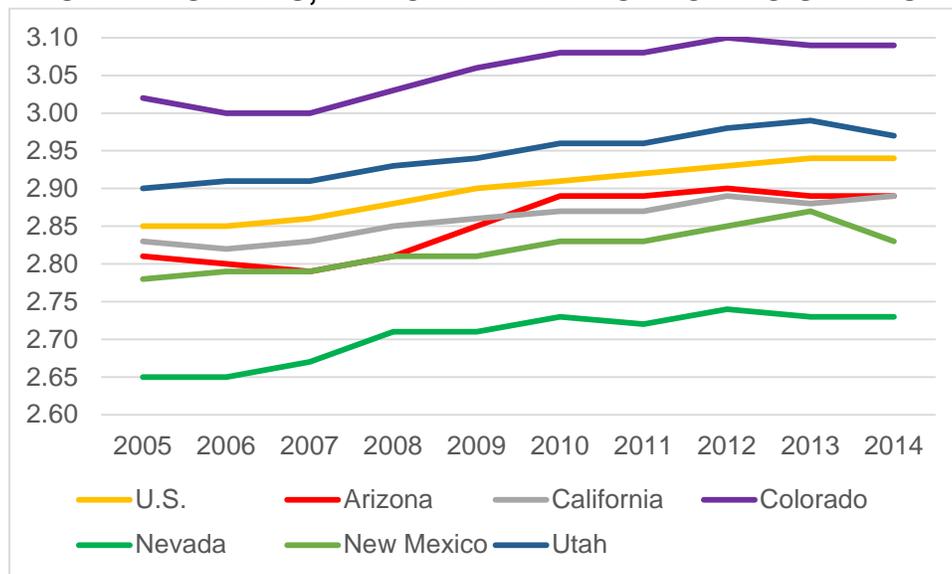
Source: U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey, <http://stats.bls.gov/webapps/legacy/cpsatab4.htm>.

Northeast, extending as far south as Virginia, also had high scores, particularly Connecticut and Maryland. Minnesota, Colorado, and Washington also ranked in the top 10. The lowest attainment was in Nevada; the other states with low attainment were in the South, extending as far west as New Mexico. Arizona was below the national average, ranking 36th, and was in the middle of 10 western states. In these western states, Colorado had the highest score, followed in order by Washington, Oregon, and Utah. The other western states were below the national average, with the lowest figures in Nevada, Texas, and New Mexico.

The ACS time series is limited to the 2005-to-2014 period. In most states over this period, the change in educational attainment of the workforce was not substantially different from the national average. Five of the 10 states with the greatest gain in score were southern states while five of the 10 with the least gain were western states. The change in Arizona was similar to the nation, with the state ranking 29th. Looking more narrowly at the period since the last recession (2010 through 2014), Arizona lagged behind the nation and ranked 47th. The scores from 2005 through 2014 in Arizona and its neighboring states are compared to the nation in Chart 4. The annual ups and downs by state likely reflect sampling error.

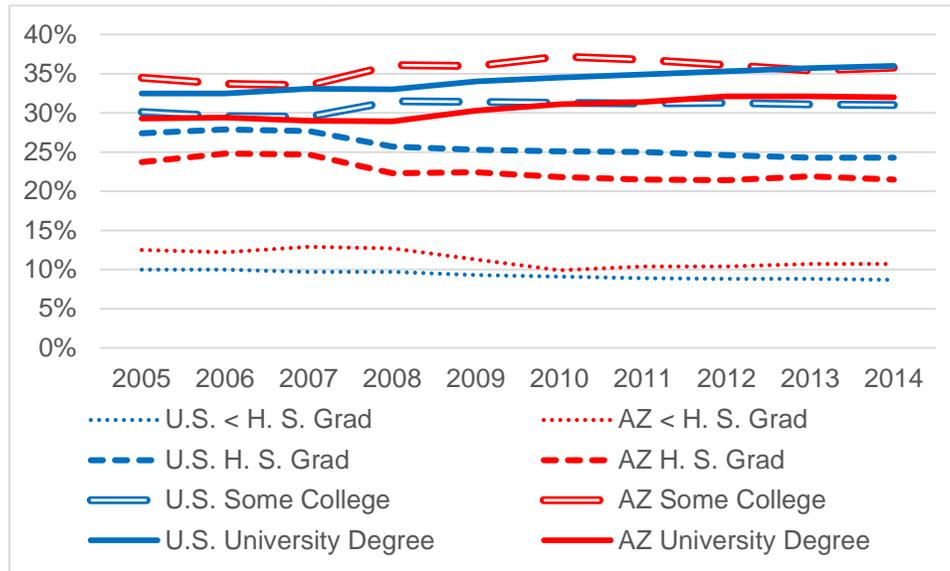
A closer look at the differences between Arizona and the nation in the educational attainment of the workforce is presented in Chart 5. Arizona has consistently had a larger share of workers without a high school diploma and a lesser share with a high school diploma as their maximum achievement. The share with some college has consistently been above average, but the share with at least a bachelor’s degree has been uniformly below average. Thus, the shortfall of university graduates and the excess of workers without a high school diploma causes the educational attainment score to be below the national average.

**CHART 4  
EDUCATIONAL ATTAINMENT SCORE OF THE WORKFORCE,  
UNITED STATES, ARIZONA AND NEIGHBORING STATES**



Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table B23006, <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>.

**CHART 5  
SHARES OF THE WORKFORCE BY EDUCATIONAL ATTAINMENT CATEGORY,  
ARIZONA AND UNITED STATES**



Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table B23006, <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>.

In 2014, the highest workforce shares of those without a high school diploma were in the four states bordering Mexico and in Nevada. Arizona had the fifth-highest figure at 10.7 percent. These were the only states with shares exceeding 10 percent. Several states had a share of less than 5 percent.

The share with at least a bachelor’s degree was highest in the District of Columbia, followed by Massachusetts, Maryland, Connecticut and New Jersey, each with shares of at least 44 percent. Other states with a share of at least 40 percent included Virginia, Colorado, New York, and Vermont. In contrast, the share was less than 30 percent in several states, with Nevada having the lowest figure at 25 percent. Arizona ranked 34th with a share of 32 percent.

Among those 25-to-64 years old who were employed, 67.8 percent of Arizonans had attended college, compared to 67.0 percent nationally. Among everyone 25-to-64 years old, 62.6 percent of Arizonans had attended college compared to 61.9 percent nationally. However, the share earning a degree (associate’s and higher) was only 36.7 percent in Arizona compared to 40.4 percent nationally. Among everyone 25 and older, 61.8 percent of Arizonans had attended college compared to 59.3 percent nationally. The share earning a degree was 36.1 percent in Arizona compared to 38.3 percent nationally.

The educational attainment of workers by more narrow age groups is not available. Of all individuals 25-to-34 years old, Arizona in 2014 was further behind the nation than in the broader age group. It was below average even on those with some postsecondary education (62.8 versus 65.2 percent) and considerably below average on those with associate’s or higher degrees (35.0 versus 42.3 percent) and those with bachelor’s or higher degrees (36.0 versus 33.5 percent).

# THE PRODUCTIVITY AND PROSPERITY PROJECT

The Productivity and Prosperity Project: An Analysis of Economic Competitiveness (P3) is an ongoing initiative begun in 2005, sponsored by Arizona State University President Michael M. Crow. P3 analyses incorporate literature reviews, existing empirical evidence, and economic and econometric analyses.

Enhancing productivity is the primary means of attaining economic prosperity. Productive individuals and businesses are the most competitive and prosperous. Competitive regions attract and retain these productive workers and businesses, resulting in strong economic growth and high standards of living. An overarching objective of P3's work is to examine competitiveness from the perspective of an individual, a business, a region, and a country.

## THE CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH

The Center for Competitiveness and Prosperity Research is a research unit of the L. William Seidman Research Institute in the W. P. Carey School of Business, specializing in applied economic and demographic research with a geographic emphasis on Arizona and the metropolitan Phoenix area. The Center conducts research projects under sponsorship of private businesses, nonprofit organizations, government entities and other ASU units. In particular, the Center administers both the Productivity and Prosperity Project, and the Office of the University Economist.

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