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AGENDA

Academic Standards & Assessments Subcommittee

Monday, November 7, 2016
10:00 a.m.
Room 433, Blatt Building

I. Welcome and Introductions ..... Dr. Danny Merck

II. Approval of Minutes of September 19, 2016 & October 3, 2016 ..... Dr. Danny Merck

III. Recommendations of the Accountability Working Group ..... Superintendent's Division of SCASA

IV. Presentation on Measuring Student Growth ..... Dr. Terry Holliday
Senior Advisor
Council of Chief State School Officers

V. Discussion

VI. Adjournment

Subcommittee Members:
Dr. Danny Merck, Chair
Neil Robinson, Vice Chair
Sen. Mike Fair
Barbara Hairfield
Dr. John Stockwell
Sen. Wes Hayes
Patti Tate

Academic Standards and Assessment Subcommittee Meeting

September 19, 2016

Meeting Minutes

Subcommittee members present: Danny Merck (Chair); Sen. Mike Fair; Barbara Hairfield; John Stockwell; and Anne Bull

Other EOC members present: Bob Couch; Rep. Dwight Loftis

EOC staff present: Melanie Barton; Kevin Andrews; Rainey Knight; Bunnie Ward; and Dana Yow

Guests from High School Task Force: Dr. Matt Nelson from Center for College and Career Readiness at Francis Marion University; Dr. Sean Alford, Superintendent of Aiken County School District; Dr. George Petersen, Eugene T. Moore School of Education at Clemson University; Dr. John Lane of the SC Commission on Higher Education; Dr. Hope Rivers, SC Technical College System; and Dr. Lee D'Andrea, Chair of the Task Force

Dr. Merck welcomed members and guests to the meeting.

The minutes of the July 11, 2016 Academic Standards and Assessment Subcommittee were approved as distributed.

Public Input on K-12 Accountability

Dr. Merck then recognized Dr. Gerrita Postlewait, Superintendent of the Charleston County School District. Dr. Postlewait provided an overview of the local accountability system that the Charleston County School District will use to make systemic improvement in educational achievement and student outcomes. The objective is to improve college and career readiness of their high school graduates. Daily, thirty individuals are migrating to the Trident area to fill the technical and high-wage jobs being created. Simply explained, the current public education system is not producing enough highly educated workers for the available jobs. Dr. Postlewait focused on the gap between the former state accountability system and the college readiness of graduates. Looking at end-of-course scores in algebra, almost 87% of African-American students passed with C or better on the end-of-course exams. However, when the district looked at the 2015 11th grade ACT results, less than 5 percent of African-American students met the ACT benchmarks in mathematics. Of the 419 graduates from the Charleston County School District in 2015 who 2015 who enrolled in Trident Technical College in the fall of 2015, only ten percent were college-ready with 90 percent required to take at least one development studies course prior to entering university-transfer credit-bearing courses. Dr. Postlewait also described the measures beginning in prekindergarten that will guide the district in making instructional changes to ensure all students are college, career and citizenship ready. The district will also use RIT scores on Measures of Academic Progress (MAP) that have been aligned to college readiness across colleges and universities to ensure students are on track to be college and career ready in Reading and mathematics. The district will also assess 10th graders in Accuplacer to set benchmarks. Dr. Postlewait concluded by comparing Charleston as

a microcosm of the state with rural and urban schools and schools, many that are racially identifiable. Rating schools whose students have vastly different distances to meet the same goal is not helpful and is potentially detrimental. Local and state accountability systems should work in tandem.

Dr. Couch also asked about "seat time." Dr. Postlewait responded that seat time is not important and emphasis should be on proficiency and readiness. Rep. Loftis inquired about CATE participation. Approximate 30% of CCSD students are in STEM-related paths but they are ill-defined in the district. Dr. Postlewait noted clearer definitions and skills are needed to truly understand if students are prepared for STEM careers. Dr. Merck asked about recommended MAP cut scores for third grade retention. Dr. Postlewait responded they have asked for assistance from the Lastinger Center in Florida to establish cut scores.

Dr. Merck then called upon Dr. Sean Alford, Superintendent of the Aiken County School District and a member of the High School Task Force to discuss his perspective on accountability. Dr. Alford reiterated a need for a common metric and standard definition of college readiness across the higher education system. He also noted that skill acquisition must be included as well to meet the Profile of the South Carolina Graduate.

Sen. Fair asked if the degree or certificate rate at Aiken Tech is aligned with the college-readiness scores (22 on ACT). Dr. Alford was not sure because they do not track it but it's helpful so they can guide students. Entry requirements for Aiken Tech is 91 on Compass, which is now being replaced by Accuplacer. It has been more difficult for Aiken graduates due to the local requirement for a higher score.

Dr. Stockwell asked if there have been conversations at the higher ed levels regarding a common college readiness/Accuplacer score across the state. Dr. Hope Rivers with the South Carolina Technical College System noted a workgroup has been established to discuss a common cut score for college transfer courses. Some local technical colleges are moving faster than other colleges. Smaller colleges have Compass tests remaining and can continue to use these. By the Spring semester, all technical colleges will transition to Accuplacer. Melanie Barton asked about the cost of using Accuplacer in 10th grade Dr. Rivers did not know the cost of the test.

Ms. Barton noted Kentucky, Tennessee, North Carolina and Alabama have established common cut scores in different ways. Dr. Lane noted CHE is eager to have that conversation. CHE has facilitated conversations aligned with their statutory role since its authority extends to ensure reasonable admission standards (but not to dictate admission standards). CHE has convened a task force every two years to recommend high school coursework to ensure students are ready for higher education. They made recommendations and distributed them within the past year. CHE is looking for additional opportunities to continue the conversations.

Dr. Alford noted the definition of "college and career ready" needs to be carefully considered. For example, if a graduate enters a two-year college and needs remediation but then successfully completes a postsecondary degree or credential, then the definition should reflect such success. Dr. Rivers noted there are a lot of advanced manufacturers that would like to

have students skilled and working for them. There is more interest in consideration of multiple measures to determine if a student is ready to move on to college work. For example, in addition to Accuplacer, institutions consider a student's grade point average.

Measuring college and career readiness and early readiness

Then Dr. Merck and the Subcommittee discussed how to measure college and career readiness and early readiness. Ms. Barton noted there is a difference between data that are part of accountability system and data that are reported. If South Carolina develops a longitudinal data system, we could report students' postsecondary experiences and successes. For accountability, "college ready" could be measured by ACT and career ready by a Silver or better certification on WorkKeys or by scoring at the 50th percentile or better on ASVAB. For reporting purposes, South Carolina does not have the data tor report graduates who have earned a postsecondary credential or those who are gainfully employed five years after high school graduation. Ms. Barton noted it would be helpful to also include Accuplacer scores in 10th grade as another accountability measure for "college ready."

Dr. Stockwell asked about the relative cost of ACT compared to Accuplacer.

Ms. Barton noted Tennessee provides ACT multiple times to students on a voluntary basis and use the highest score. Pierce McNair, Director of Research for the House Education and Public Works Committee, reiterated concern that current end-of-course tests appear not to be good measures of college ready. He asked if end-of-course exams were more rigorous would that be helpful. Dr. Alford stated no because not all courses are relevant to college readiness. Dr. Sheila Quinn of the SC Department of Education noted that 65% of 10th graders take PSAT, which is a more rigorous measure of college readiness.

In discussing early readiness, Ms. Barton noted we need a kindergarten readiness assessment that is comprehensive and covers all five domains. Ms. Barton reiterated that the SC Department of Education is prepared to implement a pilot of a comprehensive readiness assessment during the 2017-18 school year.

Ms. Barton noted that Ohio uses results from reading diagnostic assessments in kindergarten through the beginning of 3rd grade to determine if students are on track to be reading on grade level at the end of third grade. Mrs. Barton suggested students need to be reading at least at 40th percentile to be on the trajectory for college and career readiness.

Ms. Hairfield asked if there are other assessments available for other domains. Dr. Quinn noted SCDE is participating in an assessment consortium with Ohio and Maryland. Four states are currently using it, including Tennessee. Ms. Hairfield also expressed concern that early grades be assessed to understand students' progress prior to third grade. Dr. Stockwell noted it is critical to know a student's starting point early so that needs can be met early. Communities need to know how other resources can be leveraged to assist students and families in the birth to 5 age group. Mr. Robinson reiterated the "sooner the better" approach.

There being no further business, the meeting was adjourned.

Academic Standards and Assessment and Public Awareness Subcommittee Meeting

October 3, 2016

Meeting Minutes

Subcommittee members present: Danny Merck (Chair); Sen. Mike Fair; John Stockwell; Sen. Wes Hayes; Anne Bull; and Rep. Raye Felder

Other EOC members present: Dr. Bob Couch and Rep. Dwight Loftis

EOC staff present: Melanie Barton; Kevin Andrews; Rainey Knight; Bunnie Ward; and Dana Yow

Welcome and Introductions

Dr. Merck called the meeting to order, welcoming everyone to the joint meeting. He introduced Dan Ralyea, Director of Data Management from the SC Dept. of Education. Mr. Ralyea presented the report card portal developed by the SCDE. He explained his division's efforts to get data to school districts earlier. Currently, the site is open to districts with embargoed data. The numbers will evolve as continuous enrollment numbers are verified and calculations are final. The opportunities page is driven by what districts self-report on the summer survey. Rep. Felder asked about having more than two years of data available for schools and districts. She said having at least three years of previous years' data would be better to determine improvement. Also, she said it would be better if schools and districts could get information before November of the next year. When asked if the state report card was available, Mr. Ralyea stated it was not yet available.

Discussion

Dr. Merck invited attendees to the podium who had signed up to speak to the subcommittee members. The first speaker was Chandra Robinson, President of the Social Studies Supervisors Association. She was joined by Albert Robinson with the same group. Both talked about the need for social studies to remain a vital part of the accountability system. Both discussed the need for strong civics education and reminded members that "social sciences" were an integral part of the Profile of the SC Graduate.

The next speaker group was led by Tana Lee. She discussed the CATE group's wish to move the unit requirements for a CATE Completer from 4 to 3. Ms. Barton asked about the industry credential. Ms. Lee said the group wants to use WorkKeys as a Career Credential at the Silver level.

The next speaker was Hunter Schempf, the Director of Policy and Analytics with the SC Public Charter School District. Mr. Schempf discussed the need for accountability, stating it was a hallmark of charter schools. He stated it is important to test smarter, not harder. He stated that a student growth model really matters. Achievement level increases, according to Schempf, don't really tell us much information. He stated that the charter schools use EVAAS to determine growth. It is agnostic to poverty and rewards schools making substantial growth. Like the TN model, it is important to report subgroup performance and take action. He explained the difference between norm-referenced assessments like the SAT-10 and a criterion-referenced test like SC Ready. He said there are challenges with using norm referenced tests in state accountability models. Schempf encouraged careful attention to using Lexiles in a growth model, stated that Meta-Metrix cautions the use of Lexiles. He also said it is important to include growth models that include math, not just reading. Schempf's colleague Kerry Donahue, Director of Strategy with the charter schools, spoke next. She stated that we have a broader opportunity to advanced public education with the development of the new accountability system. She said we often lose sight of to whom the education system is accountable to – the students. We must view accountability as an important duty and

we need pressure to improve. She suggested using former Governor Jeb Bush's requirements in a system: 1. A system must measure data that accountability reflects; 2. Disseminate results; and 3. Reward and incentivize success. It is important to fully align a system to an articulated goal. Use alignment and track progress early on. Student growth must be tracked. Lastly, annually disaggregate goals. An accountability system would be more meaningful with a summative rating system. Sen. Fair asked Ms. Donahue for clarity on what she means by students being "under-served" in the current system. Ms. Donahue stated that more than money, she was discussing a lack of opportunities available to students like AP and IB.

The next speaker was Mr. Rodney Johnson, Principal of the LEAD Academy Charter School, a school in the Public Charter School District. He feels that schools need to be judged fairly and that report cards are a good tool for the public to know about our schools. He also feels like a big focus of report cards should be student learning growth, achievement gap closure, career readiness, and the need to make sure students are ready to achieve. Parents without backgrounds in education need report cards to be meaningful in an accessible way. Johnson supports a summative rating and suggested that we look at a way that report cards can be digested in a meaningful way. He passed out copies of the report cards distributed in Georgia.

Dana Laurens, with SC Students First, spoke to the group and gave five broad recommendations for the new accountability system. Data must be released in a timely manner – as close to the school year as possible. The public and parents also need data before the start of the school year. The recommendations include 1. Report cards need to be accessible. Need one-page report with performance ratings. Laurens reminded the group that 11 of 16 SREB states use A-F rating systems to rate schools. 2. Schools with at least one subgroup at the lowest performance level shouldn't earn the highest accountability rating. 3. Ensure state data from all grade levels should be included in report cards. Need to know if students are on track. 4. Set rigorous cut scores that reflect high standards. 5. Create longitudinal data system.

Oran Smith from Palmetto Promise Institute discussed the A-F grading system in Florida, pointing to the research that shows that A-F communicates to parents and families that are not familiar with the education system.. He suggested schools and districts having one overall grade; it is clear, transparent, and unambiguous. Schools rated "F" don't mean the teachers there are "F" teachers. We must reward growth which provides incentives to get students to grade level.

The final speaker was Bernadette Hampton, who is a high school teacher and represented the SC Education Association. She appealed to the group for smaller class sizes and a reduction of testing, which would free teachers up to instill a love of learning within their students. Dr. Merck asked Ms. Barton to provide an update from the last meeting of the ASA Subcommittee. Ms. Barton stressed the need to determine whether students needed to be college- AND career-ready or college- OR career-ready. She said this decision will drive the system. She also said that absent a decision on college-ready benchmarks from CHE, the ACT College Ready benchmarks would need to be adopted to move forward. She discussed the use of Accuplacer and that the EIA subcommittee may recommend providing funds for the cost of the administration of the test. Mr. Loftis wanted to know if there was a better way to differentiate college and career readiness given the differences in institutions and long-standing offerings. Ms. Barton said we have a long way to go to effectively communicate the importance of both to the general public. She said that some innovative districts are focusing on the 9^{th} and 10^{th} grade years as well as strengthening the IGP planning process. Dr. Couch stated that if you are going to college, you should be career-ready too. He looks at them as integrated, not separate from one another. Ms. Barton told the group that soft skills are increasingly important to business and industry. Transform SC is conducting a survey of soft skills to see how important they are. She will share the results of the survey with the EOC.

Ms. Barton also told subcommittee members that they will hear from the SCASA Superintendents group on October 10. Sen. Hayes wanted to know where we are on A-F rating. Dr. Merck stated there had been no formal recommendation from any group on A-F. Rep. Loftis wants to know how performance is reported out in Tennessee and stated the importance of setting benchmarks. Dr. Couch stated the importance of rewarding success and raising expectations. There have to be incentives built into the system. We can't just label schools. We are all in this together. We have to own the problem – and join arms and hands to get success. It must be a broad, cooperative, supportive effort.

There being no further business, meeting adjourned.

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MEMORANDUM

TO: Members, Academic Standards and Assessment Subcommittee

FROM: Melanie Barton Melanie D. Barton

DATE: October 25, 2016

In RE: Background Information

Please find attached the following documents that should assist you:

(1) background information on the state accountability system that measured absolute and growth for schools and districts; and

(2) recent results of assessments administered in school year 2015-16.

If you need any additional data prior to the November 7 meeting, please let me know.

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Background
SC Accountability
&
Growth Models

State Accountability System
(Last Implemented School Year 2013-14)

Absolute Rating

Students taking a SCPASS assessment (English language arts, writing, mathematics, science & social studies) received a numeric score that was then attributed to a performance level. The absolute performance level is calculated on the basis of a **weighted model – the higher the students' achievement level, the more points earned. Students who should have participated in the state testing program but did not, received a 0.**

Performance Level	Definition	Points Earned
Exemplary 5	The student demonstrates performance that consistently exceeds expectations for a typical student at this grade level.	**5**
Exemplary 4	The student demonstrates performance that exceeds expectations for a typical student at this grade level.	**4**
Met	The student demonstrates performance that meets expectations at this grade level.	**3**
Not Met 2	The student demonstrates performance that sometimes meets expectations at this grade level.	**2**
Not Met 1	There is significant need for additional instructional opportunities to achieve the met level.	**1**
Did Not Take Test	Students who are enrolled on the 45-day of school and on the first day of testing with no break in enrollment should participate in state testing.	**0**

An index was calculated for each subject area by dividing the sum of the point scores by the number of test scores for each subject area. Then, the indices were multiplied by the appropriate weight for the grade levels and tests as noted below. In grades 3-5 ELA and math counted 60% and science and social studies the remaining 40%. In middle grades, all were equally valued.

Grades 3-5				Grades 6-8			
ELA	**Math**	**Science**	**Social Studies**	**ELA**	**Math**	**Science**	**Social Studies**
0.30	0.30	0.20	0.20	0.25	0.25	0.25	0.25

Elementary School Index= ((.30*ELA) + (.30*Math) + (.20*Science) + (.20*Social Studies))/# Scores
Middle School Index = ((.25*ELA) + (.25* Math) + (.25*Science) + (.25*Social Studies))/# Scores

The result is an index that corresponds to a rating:

Absolute Rating for Elementary & Middle Schools	Absolute Indices
Excellent	3.40 or above
Good	3.18 to 3.39
Average	2.65 to 3.17
Below Average	2.32 to 2.64
At Risk	2.31 or below

For end-of-course assessments, a similar weighting system was given based on the end-of-course score:

Score	Points Earned
A	5
B	4
C	3
D	2
F	1

Growth Ratings

Growth ratings for elementary and middle schools were based on longitudinally matched student assessment data. In elementary and middle schools, each student test results from the current year were e matched to results from the prior year. Because SCPASS was not vertically aligned, value tables were used to assign points. More points were given for students moving from Not Met 1 to Not Met 2 to recognize the difficulty in moving the most underperforming students to higher academic achievement levels.

Growth Value Table

Year-One (Pre-Test)	**Year Two (Post-test)**				
	Not Met 1	**Not Met 2**	**Met**	**Exemplary 4**	**Exemplary 5**
Exemplary 5	60	70	80	90	100
Exemplary 4	70	80	90	100	110
Met	80	90	100	110	120
Not Met 2	90	100	120	130	140
Not Met 1	100	120	130	140	150

The Growth index was calculated in a manner similar to the absolute index calculations, calculating the mean values from the tables for each subject area (and applying the appropriate subject area weightings to calculate a school growth index.

Growth Rating for Elementary & Middle Schools	**Growth Indices**
Excellent	103.05 and higher
Good	102.10 to 103.04
Average	99.89 to 102.09
Below Average	98.84 to 99.88
At Risk	99.83 and lower

Criteria for High School Absolute Ratings were based on the following point systems:

	Points Assigned				
Criterion	**5**	**4**	**3**	**2**	**1**
Longitudinal Passage Rate (20%)	97.0% or more	94.3% - 96.9%	84.1% - 94.2%	75.9% - 84.0%	75.8% or less
First Attempt Exit Exam Passing Rate (20%)	93.0% or more	83.0% - 92.9%	63.1% - 82.9%	53.2% - 63.0%	53.1% or less
% Scoring 70 or above on End-of-Course Tests (20%)	75.5% or more	64.3% - 75.4%	42.0% - 64.2%	30.8% - 41.9%	30.7% or less
On-Time Graduation Rate (30%)	96.1% or more	84.0% - 96.0%	59.6% - 83.9%	47.4% - 59.5%	47.3% or less
5-Year Graduation Rate	97.0% or more	87.7% - 96.9%	62.7% - 87.6%	50.3% - 62.6%	50.2% or less

Most Recent Assessment Results

What were the statewide results on SC Ready for 2015-16?

The Education Oversight Committee (EOC) is required by state law to approve all new assessments used in accountability. Until such time as the independent evaluator, who will be hired to evaluate the assessment against the requirements of Acts 155 and 200 of 2014, can review the test items and cut scores, the following information is based upon information obtained from the SC Department of Education (SCDE).

In March of 2015 the State Board of Education and the EOC adopted South Carolina College-and Career-Readiness Standards in English language arts (ELA) and mathematics. These standards replaced the Common Core State Standards. SCDE then procured the services of Data Recognition Corporation (DRC) to design a test that effectively measured these college- and career-ready standards and met the qualifications of Acts 155 and 200 of 2014. According to state law, the assessment system must meet the following minimum requirements:

1. compare performance of students in South Carolina to other students' performance on comparable standards in other states with the ability to link the scales of the South Carolina assessment to the scales from other assessments measuring those comparable standards;
2. be a vertically scaled, benchmarked, standards-based assessment;
3. measure a student's preparedness for the next level of their educational matriculation and individual student performance against the state standards in English/language arts, reading, writing, and mathematics and student growth
4. Document student progress toward national college and career readiness benchmarks derived from empirical research and state standards;
5. Establish at least four student achievement levels;
6. Include various test questions including, but not limited to, multiple choice, constructed response, and selected response, that require students to demonstrate their understanding of the content;
7. Be administered to students in a paper-based format in 2014-2015, in either a paper-based form or computer-based format in 2015-2016, and to all students in a computer-based format by school year 2016-2017; and
8. Assist school districts and schools in aligning assessment, curriculum, and instruction.

DRC developed a test that was named SC Ready. Student performance descriptors were established by SCDE. Cut scores corresponding to the student achievement levels set by the SCDE were established by a group of educators who met during the summer of 2016 and by a process referred to as "smoothing" by SCDE staff working with DRC and a Technical Advisory Committee.

According to SCDE, "SC READY test items are aligned to the standards for each subject and grade level. Standards outline what schools are expected to teach and what students are expected to learn. Academic standards also include indicators that are statements of the specific cognitive processes and the content knowledge and skills that students must demonstrate to meet the grade-level standards. SC READY test items are written to assess the content knowledge and skills described in the academic standards and indicators."[1]

[1] http://ed.sc.gov/tests/middle/south-carolina-college-and-career-ready-assessments-sc-ready/

"Four performance levels and definitions were established by the SCDE to reflect the continuum of knowledge and skills exhibited by students on SC READY ELA and mathematics tests: Exceeds, Meets, Approaches, and Does Not Meet Expectations.

> Exceeds Expectations – The student exceeds expectations as defined by the grade-level content standards.
>
> Meets Expectations – The student meets expectations as defined by the grade-level content standards.
>
> Approaches Expectations – The student approaches expectations as defined by the grade-level content standards.
>
> Does Not Meet Expectations – The student does not meet expectations as defined by the grade-level content standards." [2]

The following represent the results of SC Ready's administration in school year 2015-16.

English Language Arts

% Students Scoring at Each Level by Grade Level

Grade	Does not Meet	Approaches	Meets	Exceeds
3	22.2	34.1	29.3	14.4
4	24.2	32.4	28.8	14.6
5	23.9	34.9	27.9	13.3
6	20.4	38.6	26.9	14.1
7	23.2	36.1	26.8	13.9
8	22.4	32.9	30.2	14.5

Mathematics

% Students Scoring at Each Level by Grade Level

Grade	Does Not Meet	Approaches	Meets	Exceeds
3	21.5	24.9	33.7	20.0
4	22.7	30.6	24.9	21.8
5	22.9	32.9	25.4	18.9
6	25.8	34.7	22.4	17.1
7	26.6	38.7	19.6	15.1
8	29.3	38.3	18.6	13.8

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[2] *Score Report User's Guide - For Use with Spring 2016 Score Reports*. Office of Assessment. SC Department of Education. Page 4. <http://ed.sc.gov/tests/middle/south-carolina-college-and-career-ready-assessments-sc-ready/screadyscore-report-user-s-guide/>

How do the percentages of students in grades 4 and scoring Proficient and above on the National Assessment of Educational Progress (NAEP) in mathematics and reading compare to SC Ready, 2016 scores in ELA & mathematics?

NAEP is administered to a representative sample of students in grades 4 and 8 in South Carolina every other year. The results of NAEP in 2015 are compared below to SC Ready results in 2016. According to the National Assessment Governing Board, students who perform at the *Basic* achievement level show "partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade." Students who perform at the *Proficient* achievement level demonstrate competency over challenging subject matter.[3]

% Students Scoring at Each Level by Grade Level

Grade - Content	NAEP, 2015 % ***Proficient*** or Above	SC Ready, 2016 % Scoring **Meets** or Above		NAEP, 2015 % ***Basic*** or Above	SC Ready, 2016 % Scoring **Approaches Expectations** or Above
4th - Math	37	46.7		80	77.3
4th - Reading	33	43.4		64	75.8
8th- Math	25	32.4		65	70.7
8th - Reading	28	44.7		62	77.6

T
his fall, ACT and WorkKeys scores were also released.

The ACT
% SC Juniors Meeting Benchmarks

	ACT Benchmarks	2015	2016
English	18	38.7%	39.5%
Mathematics	22	21.6%	23.5%
Reading	22	25.8%	29.5%
Science	23	17.9%	21.2%
N=		48,528	47,469

[3] https://nces.ed.gov/nationsreportcard/pubs/studies/2011458.asp

The ACT Composite Scores SC Juniors by Ethnicity

	2015	2016
All Students	17.9	18.2
Hispanic	16.7	16.9
Black	15.1	15.4
White	19.6	19.9

WorkKeys, % SC Juniors Earning:

National Career Readiness Certificate	2014-15	2015-16
Platinum	0.8%	0.2%
Gold	22.1%	17.2%
Silver	40.0%	47.7%
Bronze	25.1%	21.7%

The percentage of students earning Silver or better increased from 63% in 2014-15 to 65% in 2015-16.

FYI

EDUCATION POLICY Center
at American Institutes for Research

Equality and Quality in U.S. Education

Systemic Problems, Systemic Solutions

By Jennifer A. O'Day and Marshall S. Smith

SEPTEMBER 2016

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ABOUT THIS BRIEF

This brief is a condensed version of a recently published book chapter titled "Quality and Equality in American Education: Systemic Problems, Systemic Solutions" that was published in *The Dynamics of Opportunity in America: Evidence and Perspectives* by Irwin Kirsch and Henry Braun (Springer, 2016), which includes a more extensive treatment of the issues discussed here.

ABOUT THE AUTHORS

Jennifer A. O'Day is an Institute Fellow of American Institutes for Research and is the Founder and Chair of the California Collaborative on District Reform. Her research has focused on system change, improvement in high-poverty districts and schools, and policies affecting English language learners.

Marshall S. Smith is a Senior Scholar at the Carnegie Foundation for the Advancement of Teaching, a former Dean and Professor at Stanford, and a former Under Secretary and Acting Deputy Secretary at the U.S. Department of Education in the Clinton administration. He is a Fellow of the American Academy of Arts and Sciences and the National Academy of Education.

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Recent passage of the federal Every Student Succeeds Act (ESSA), coupled with recognition of rising inequality in American society, has rekindled debate about how U.S. schools might address long-standing disparities in educational and economic opportunities while improving the educational outcomes for all students. This paper enters that debate with a vision and an argument for realizing that vision, based on lessons learned from 60 years of education research and reform efforts. The central points covered draw on a much more extensive treatment of these issues published last year.[1] The aim is to spark fruitful discussion among educators, policymakers, and researchers.

An Unequal Present

Poverty and Segregation

Let's start with the children. Twenty-three percent (16 million) of American children live in poverty,[2] and children of color are more than twice as likely as their White counterparts to be poor.[3] Many of these children live in neighborhoods that are increasingly segregated by social class, endowed with far fewer resources (recreational facilities, child care, health care, and even fresh foods), and plagued by far greater stresses than neighborhoods housing middle class and more privileged families. Moreover, fewer than half of the children from low-income families experience preschool, so they enter kindergarten lacking the vocabulary, number skills, and socializing experiences that children from better-off families possess. Once in school, students from low-income families achieve less well on average and graduate at much lower rates than students from middle-income households. The powerful effects of poverty for children of all races and ages have been well documented and help explain some of the lack of progress.

Where Do Schools Fit In?

Education is meant to be the great equalizer. Yet, the disparities that children experience outside school are actually exacerbated when they enter the doors of most U.S. education systems. These well-documented, within-school inequities include both unequal resources and dysfunctional practices and systems. Concentrated in higher poverty schools, students from low-income families, students of color, English learners, and immigrant students are more likely than their White middle-class peers to be taught by inexperienced or ineffective teachers, to be presented with watered-down and uninspiring curricula, to be situated in a chaotic school environment with high turnover rates among the adults, and to be excluded from meaningful instruction by discriminatory disciplinary policies and practices.

Disparate and Overall Mediocre Student Outcomes

Given these disparities, it is hardly surprising that the National Assessment of Educational Progress (NAEP) records achievement gaps in mathematics of two or more years between eighth-grade Black or Hispanic students and their White peers as well as between students from low- and high-income families. The gaps for reading are smaller but still substantial. With respect to high school completion, which is a strong predictor of adult income, White students graduate at a rate that is 15 percentage points higher than that for Black students, and 11 percentage points higher than that for Hispanic students.[4]

These inequitable conditions and results do not simply diminish opportunities for traditionally underserved students. Their existence pollutes the system as a whole, creating low expectations and loss of public confidence and thus depressing the quality of schooling for all—or at least the vast majority of—students in American schools. International comparisons on such assessments as the Programme for International Student Assessment (PISA), and, to a lesser extent, the Third International Mathematics and Science Study (TIMSS), show that the U.S. lags well behind many other advanced nations with respect to student knowledge and skills. Though these patterns are pervasive and persistent, they are not immutable.

Signs of Progress

Student achievement and attainment data from the past 2 decades suggest progress in some areas. For example, eighth-grade mathematics scores have increased on both the international TIMSS assessment (a 17-point gain between 1995 and 2011) and NAEP (a 12-point gain between 1996 and 2013), with smaller gains in reading. Average freshman graduation rates are also up, reaching a high of 82% in 2013–14. Equally important, achievement gaps between White students and both Black and Hispanic students have narrowed significantly in mathematics, again with smaller benefits in reading. In addition, increases in high school completion rates among Black and Hispanic students between 2000 and 2010 were between two and three times the increases for White students, thus narrowing graduation disparities.

Tempering this positive news, however, are two significant facts. First, there has been **virtually no reduction in the gaps between poor[5] and nonpoor students,** suggesting that a dominant force driving disparate outcomes among students—and overall achievement and attainment levels—is family income and its concomitant conditions. Second, in contrast to some gains on TIMSS, U.S. performance on the PISA has been essentially stagnant since its inception in 2003 and has even fallen slightly (by two points) in mathematics. This contrast suggests that the positive momentum in achievement may

pertain primarily to tests of more procedural knowledge, not to assessments that require students to apply their knowledge and skills to analyze novel situations and solve complex problems—the very type of performance needed for success in the 21st century.[6] We clearly have much more work to do.

Observations from 60 Years of Education Reform: There Are No Silver Bullets

American education has been through numerous reform efforts in the past 60 years, many of them focused on reducing opportunity gaps both in our society as a whole and in our schools. We have directed money at the problem through supplemental funding streams, such as the federal Elementary and Secondary Education Act (ESEA) and state categorical programs, and through myriad state fiscal equity suits and policies. We have tracked (and de-tracked) students and tried homogeneous grouping by ability and heterogeneous cooperative learning in the classroom. We have tried pullout and push-in instructional approaches to give extra support to students who need it. We have focused exclusively on academics, only to turn around and chide ourselves for ignoring the whole child. We have thought teacher testing and formal qualifications on the front end were the answer to low educator quality, moving more recently to test-driven teacher evaluation as the new required solution. And the list goes on.

Many of these reforms have at least some evidence behind them to suggest their potential effectiveness, and some have been critical to the limited progress toward equity and equality cited earlier. Yet, when implemented at scale in schools and districts, the results often disappoint or even disappear.

In contrast, across the U.S., we find examples of educational systems that have demonstrated sustained improvement and that have reduced opportunity and achievement gaps through concerted and coherent systemic efforts to ensure the success of all their students. These include local school systems, such as the Long Beach or Garden Grove Unified School Districts in California and Montgomery County in Maryland, as well as a few states, such as Massachusetts, where the data demonstrate the possibilities for both quality and equality in educational opportunities.

The approach these systems take stands in sharp contrast to many of the education reform fads of the past 60 years. Their success has come not from isolated and piecemeal interventions, for which U.S. education seems to have a penchant, but rather from strategies carefully integrated into the system so that they contribute to, rather than detract from, the system's overall culture and effectiveness. Similarly, success has come

not from blaming teachers and threatening schools but rather from expecting and supporting improvement over time and learning from mistakes. And success has come not from seeing schools and districts as isolated organizations but rather as part of their communities' core institutions and partners.

The contrast between the experiences of these existence proofs and the patterns of less successful endeavors suggest three key lessons that can inform both a vision of a more equitable future and a strategic approach to getting there.

Lesson One: Implementation Dominates Impact

Decades of implementation research have yielded a panoply of lessons. Three are integral to making a more equitable education system operational.

Context matters. Differences in educational histories; in the makeup of both adult and student populations; and in cultures, conditions, structures, and resources across systems can influence the ways that local actors interpret and act on any given reform or intervention. Attempts to constrain variation in local action by emphasizing fidelity, scripted instructional programs, and compliance to one-size-fits all policies do not solve the problem and may even be counterproductive because they often inhibit professional judgment and responsiveness to individual student and local system needs.

Capacity is a key determinant of implementation quality and results. At the heart of many of the differences across contexts is their variation in local capacity, including *human capital* (the knowledge and skills of the individual actors and of the collective body of actors), *material resources,* and *program and system coherence*. Higher poverty schools and districts generally have less of all three, making implementation and improvement harder to realize and sustain. Low capacity in any of these arenas may invite dysfunction and failure.

Implementation is a social process. Effective implementation requires activating relationships among people, groups, and organizations (social capital)—not just once but repeatedly and continually. In high-poverty contexts, staff turnover and a lack of trust often impede the development of the strong relationships needed to make evidence-based practices work and to foster individual and organizational learning. Attempts to ensure implementation and the spread of effective practices through administrative mandates do little to solve the problem as they too often lead to superficial compliance without deep understanding or committed action.

Lesson Two:
Piecemeal Reforms Leave Systemic Contributors Untouched

Many of these implementation challenges persist because isolated and piecemeal reforms seldom address the underlying systemic contributors to the targeted situation or inequity. Moreover, incoherence and instability in the policy environment make it difficult to identify and change these contributing conditions. Superintendents, school boards, and legislators come and go—often with great frequency—whereas disparities in resources and practices go on, bolstered by institutionalized structures and beliefs. On the ground, schools in high-poverty neighborhoods lack the information, trust, and capacity they need to examine their practices and results over time and are pulled in multiple and conflicting directions by the mixed messages they receive. High-stakes testing and rigid accountability measures can compound these issues and have the effect of drawing attention to avoiding consequences for adults rather than ensuring progress for students.

Lesson Three:
Schools Can't Do It Alone

The "no excuses" rhetoric of the No Child Left Behind (NCLB) era sounded tough and committed but did little to address the profound influence of poverty on a child's chances for success in school and beyond. This rhetoric has more recently given way to recognition that although schools must address inequities stemming from educational policies and practices, they cannot overcome inequality on their own. Instead, more successful educational systems have partnered in innovative and sustained ways with other child-serving agencies and institutions, including postsecondary institutions, to develop more comprehensive and mutually reinforcing strategies—such as youth development programs, school-based health services, and social welfare supports for parents—to ensure that all students have an opportunity to succeed.

A Vision of a More Equitable Education System

What might a more equitable education system look like in the U.S.? And how might a vision for such a system be constrained by current conditions? For starters, let's assume that, even with the continued expansion of technology, most students in the next 2 decades will likely be attending public schools configured much like those of today—that is, 20–30 students in classes with one or two adults for 12–13 years, nested in schools and districts within broader state systems. Moreover, experience and current socioeconomic patterns strongly suggest that the inequalities in children's economic and social environments are likely to continue for the foreseeable future.

Given these constraints, three central system components emerge from both research and experience as essential for American education to have a measurable and sustained impact on gaps in educational opportunities and outcomes:

- **A foundational focus on improving the overall quality of schools and school systems** through a coherent, standards-based approach *coupled with* continuous improvement processes at all levels of the system
- **High-leverage targeted strategies adapted to local environments** to address issues particularly consequential for traditionally underserved students
- **Effective connections among schools and other institutions** and organizations touching students lives

The Foundation: A Quality School System

Since quality and inequality are integrally linked, achieving greater equality requires ensuring a higher quality education for all. In part, this means what it has always meant—making sure that all schools and school systems have adequate, appropriate, and equitable resources to address the needs of their diverse student populations. But just as important is how those resources are used. A more equitable system would have two fundamental components built in to guide the use of resources for student success.

A Coherent Standards-Based Policy Framework. The odds of success for a school with a student population that has lacked important opportunities rise substantially if the school operates in a supportive environment where its internal (school) and external (district, state, and federal) leaders and policies are all pulling in the same direction toward quality and equity. Such support is the basic tenet of standards-based reform, a systemic improvement strategy comprising *challenging standards* stating what students should know and be able to do to succeed at different points in their schooling and afterwards; a coherent *system of mutually reinforcing policies* designed to build capacity and ensure that all students have access to opportunities to meet those standards; and a *redesigned governance system* in which broad central direction is combined with local discretion, knowledge, and innovation to achieve the goals for students.

The spread of standards-based strategies in the 1990s and early 2000s seems to have contributed to the modest gains in achievement and attainment cited earlier. However, this upward trend was attenuated in the NCLB era, when the emphasis on capacity building, responsive governance, and context-embedded solutions gave way to an almost singular focus on top-down mandates and punitive outcome accountability, diminishing both the quality of standards and their role in instructional improvement. With new flexibilities afforded by ESSA and lessons learned during the past quarter century, we can reset the standards-based approach in two important ways.

The first is to improve the quality of the standards that guide instruction and supportive policies. The adoption of challenging college- and career-ready standards in English language arts and mathematics by more than 40 states in the past 7 years, and by 18 states thus far in science, is a clear step in this direction.

Equally important is the second development of the past decade: a more nuanced, thoughtful, and longer term approach to implementation and continuous improvement in a growing number of state and local systems.

A Continuous Improvement Approach. The simple but demanding concept of continuous improvement is a logical extension of the lessons cited earlier about the importance of contextual conditions and systemic contributors to the success of any effort to improve outcomes for traditionally underserved students. A recent review of the continuous improvement literature highlights five basic features:[7]

- A focus on outcomes for specific populations and on the processes that produce them
- Learning from variations in performance, including (or especially) failures
- The understanding that results change only if the systems that produced them change
- The day-to-day use of evidence on outcomes, processes, and resources by participants throughout the system
- The use of coherent methodologies and processes to identify problems; devise and try out solutions; and then revise, retest, and spread strategies in an ever developing cycle (e.g., Six Sigma or LEAN)

In each of these features, continuous improvement approaches differ from the typical outcomes-based accountability model as implemented under NCLB. Particularly important are the approach to failures as opportunities for learning and improvement (rather than occasions for blame and punishment) and the engagement of participants throughout the system in ongoing data collection, analysis, and action relevant to their context-embedded roles. Continuous improvement creates an environment of productive accountability throughout the school year with multiple measures rather than a single year-end judgment.

Continuous improvement processes characterize many of our nation's best schools and districts. The Long Beach Unified School District in southern California, for instance, has been applying the core concepts of continuous improvement for more than 2 decades to improve outcomes for traditionally underserved students, who are 70% of the school population. In addition to its well-documented and prize-winning increases in overall student achievement and graduation rates, the district has narrowed other more change-resistant gaps: in the period from 2002 to 2012, gains for African-American students, Hispanic students, and students from low-income families on the state Academic Performance Index were approximately 50% higher than those for White students.

Educators in Long Beach often talk about "The Long Beach Way," referring to the district's deeply embedded cultural approach to ensuring ongoing improvement in all aspects of their work so as to enhance conditions and outcomes for all their students.

Targeted Strategies to Reduce Inequalities: Four High-Leverage Approaches

As the examples of Long Beach and similar systems demonstrate, embedding continuous improvement into the fabric of a school system can make it easier to identify and effectively address gaps in outcomes and opportunities (see Box 1 about Montgomery County). Relevant improvement practices include ongoing monitoring of access to such resources as qualified teachers and teacher time, advanced courses, and appropriate high-quality instructional materials, as well as the elimination of disparities in disciplinary actions and extracurricular activities.

BOX 1. EQUITY AND CONTINUOUS IMPROVEMENT IN MONTGOMERY COUNTY[8]

When Jerry Weast became the superintendent of the Montgomery County district in 1999, he instituted a continuous improvement approach to address the large and nationally comparable gaps between White students and their African-American and Hispanic counterparts. Geographic Information System mapping of high-poverty, high-minority, and low-achieving regions in the county catalyzed communitywide dialogue about educational disparities and race. Discussions across the district helped identify structural contributors (such as course placement policies in high school that tended to keep Hispanic and African-American students from higher level courses because they lacked the prerequisites) as well as adult norms and attitudes that prevented full access for some students. Multiple sources of data—including frequent walk-through observations using formal protocols in individual school sites—helped district leaders identify particular manifestations of unequal opportunity and design interventions, such as full-day kindergarten, small classes, and rigorous curriculum models, which they targeted to high-poverty schools.

District leaders monitored for success of these actions over time while creating a systemwide culture of collaboration focused on both excellence and equity. When Weast's 12-year tenure ended, Montgomery County had significantly reduced gaps among racial groups across multiple performance indicators: achievement on state assessments in elementary school, completion of algebra in eighth grade, SAT and Advanced Placement (AP) results, and high school graduation. Indeed, the county posted higher AP participation and success rates for African-American students than the U.S. did for students as a whole.

In addition to regular monitoring, past research has suggested several specific arenas in which targeted attention within a continuous improvement model might be particularly beneficial for reducing persistent opportunity gaps and improving quality overall.

Creating Safe and Supportive School Environments. Physical and emotional safety in schools matter hugely to every child and parent. A growing research-based movement in the education community—social-emotional learning—emphasizes the bedrock importance of interrelated cognitive, affective, and behavioral competencies to students' success. Self-awareness, self-management or self-regulation, social awareness (including empathy), opportunities for rewarding relationships, and responsible decision making form this web of competencies. Safety and support also underlie restorative justice programs that shift the typical focus on punishment to an emphasis on building self-control and respect. A social-emotional learning culture takes considerable time and energy to implement, but the results justify these investments.

Developing Language. Language skills are important throughout a child's schooling, as evidenced by the integration of language development and content learning in the Common Core State Standards and the Next Generation Science Standards. But language development may be most critical both for young students from low-income families who have had little access to preschool opportunities and for English learners. Children who are comparatively word poor by the time they reach school age may need special help acquiring the literacy and oral language skills that will be essential to their success in later grades. And for students whose families don't speak English at home, English language development is an inescapable need. While research clearly shows the cognitive benefits of bilingualism for all students, English learners face the dual challenge of mastering increasingly sophisticated and demanding content while learning a new language. One road-tested and evidence-based strategy is to combine high-quality instruction in these students' native language with instruction in English through dual-language or bilingual programs.

Implementing Tiered Interventions. Response to intervention (RTI) is a three-tiered approach to instructional intervention that is grounded first and foremost in ensuring a high-quality, accessible core instructional program for all students (tier 1) and then appropriate interventions for students who encounter difficulty succeeding in that program (tiers 2 and 3). For four out of five students, regular monitoring through formative and other assessment practices and regular feedback to students (tier 1) is enough to ensure adequate progress. But when it isn't, tier 2 interventions might include tutoring by a reading specialist or other intensive customized help. Tier 3 comes into play for the 5% to 10% of students who still don't respond. For them, special services under a federal 504 plan or even an individualized education program may be needed.

Attending to Student Transition Points. Certain predictable times in a student's journey through school can be consequential for later success, particularly for students from less-advantaged backgrounds:

- Transition into K–12 schooling in kindergarten, especially as fewer than half of all students from low-income families have preschool experience to prepare them
- Transition to intermediate grades (between Grades 3 and 4), by which time students are expected to be fluent readers able to extract meaning from text
- Transition to middle school, where preadolescent physical and emotional changes can be especially distracting when combined with the other stresses of poverty and discrimination
- Transition to and through high school, where early warning systems, multiple pathways, and strong counseling may help ensure that all students have access to appropriate courses and supports so that they graduate and have the necessary performance and course prerequisites to pursue postsecondary opportunities (see Box 2).

Transitions create opportunities and stress. Institutions with social-emotional learning cultures and effective intervention systems can help make the transitions exciting and rewarding, but even these schools may find that many students will struggle with such changes. Careful attention to students at these times can make a difference.

Connections Between Schools and Community-Based Services

The entire environment in which students live influences their development and success in school. Good medical care, healthy food, a supportive and language-rich environment, recreational facilities, and access to preschool are among the conditions that poor neighborhoods typically lack and that community-based organizations, government agencies, and churches may try to provide through various programs and services. Connecting schools to such services and organizations has long been the goal of a small but active set of reformers—from John Dewey and Jane Adams in the early 1900s to today's growing movement for community schools.

Perhaps the best-known example of a systemic community-based approach—and surely one of the most expensive—has been the Harlem Children's Zone (HCZ), which takes up a 100-block area in Harlem's largely African-American area of New York City. HCZ connects students and their families with the entire panoply of social and educational services and raises funds for new or missing services. The federal Promise Neighborhood grants program, now in more than 40 districts across the country, is modeled after the HCZ.

BOX 2. GRADUATION AND POSTSECONDARY TRANSITIONS IN FRESNO, CALIFORNIA[9]

To better ensure the transition of students to and through high school, many districts across the U.S. now have early warning and intervention systems to identify students at risk for dropping out. In the Chicago Public Schools, for example, researchers believe that the use of a ninth-grade early-warning indicator may have contributed to a 13-point increase in the percentage of ninth graders on-track for graduation between 2008 and 2011.[10]

The Fresno Unified School District in California's Central Valley has taken this approach even farther through its Equity and Access initiative, which seeks to ensure that Fresno students graduate with "the greatest number of postsecondary choices from the widest array of options." The initiative began by developing a new data system and new indicators designed specifically to inform counselors' interactions with the individual students in their charge. Examined through ongoing, structured review processes, these data allow counselors and district staff to identify student needs, pose questions related to those needs, make decisions to guide their actions, and examine changes in staff practices and student outcomes. Three types of indicators provide the necessary information for this process:

- *Student performance indicators* (e.g., course completion, grades, eligibility for various segments of the California higher education system, test scores, and behavior)
- *Student procedure indicators* (e.g., college applications, FAFSA completion, college entrance and placement exam completion, college registration and articulation, and career focus)
- *Staff practice indicators* (e.g., number of students seen by a counselor or social worker and number of eligible students applying to college). Using these data, collected and reviewed in real time, counselors can intervene to change conditions for individual students, ensuring that they complete the courses and processes necessary for graduation and postsecondary transition.

The results have been promising. Fresno is one of California's poorest districts, with a student population that is 90% minority, 84% eligible for free or reduced-price lunch, and 25% English learners. Yet, during the initial 4 years of the initiative (2010–2014), Fresno's graduation rate increased by 10 percentage points (compared with a 6-percentage point gain statewide), the A-G course completion rate (needed for acceptance to a state university) rose to 15 percentage points above the state average, applications to the California State University System went up by 16%, and matriculation in 4-year colleges increased by 14%.[11] Success in this work has led to expanding these continuous improvement methods to other areas of the district's work.

Other districts have developed different models for connecting schools to the broader community, sometimes including employers and postsecondary institutions as well as service providers.

The systemic nature of these collaborations and the urgency of the need among the populations they serve make a compelling case for their existence in every high-poverty neighborhood.

Getting From Here to There: The Problem of Change at Scale

This vision of a more equitable system addresses key shortcomings of past and current efforts to reduce achievement and opportunity gaps. It provides a framework to promote and extend system coherence, embeds improvement efforts in specific systemic contexts, balances systemwide approaches with targeted interventions for students who are underserved or struggling, and recognizes the importance of connecting schools with other agencies and organizations that affect children and their families. But envisioning a more equitable system is one thing; moving in this direction—and doing it at scale—is something else.

Bureaucratic inertia and fractured politics combine to make sustained movement difficult. But three potential sources of the pressure (to engender action) and support (to increase its effectiveness) are at hand: governmental and administrative policy, professional networks and norms, and community and stakeholder constituencies.

Designing Governmental Policy to Motivate and Support Improvement and Equity

Governmental and administrative policy at the federal, state, and local levels has been the main source of external pressure and support for educational change in the U.S.—particularly with regard to equalizing opportunities for poor students, students of color, and English learners. During the past 6 decades, policy has generally become more centralized, with states providing an increased portion of school funding (and demanding greater accountability for how those funds are spent) and the federal government taking more of a role in not only enforcing equality but also influencing the core direction of schooling. In balancing pressure and support, the scales at these two levels have generally tipped toward pressure and compliance, although requirements are often tied to categorical funding streams that wear the guise of inducements and fiscal support rather than blanket mandates.

To move toward a system that facilitates continuous improvement where it matters most—in classrooms, schools, and districts—will require reconceptualizing the roles of the three levels of government and placing greater emphasis on support for improvement relative to pressure to improve. At the core of this reconceptualization are twin principles: common commitment at all levels to equal opportunity, achievement, and attainment complemented by governmental restraint and focus on achieving these goals.

Federal Policy. In the wake of the federally intrusive policies of the NCLB Act, policy actors on both sides of the aisle have moved to pare down the amount of federal regulation and return some previously appropriated control to the states. The continuation of this positive development could productively be guided by a simple two-pronged test for what the federal government should—and should *not*—do in K–12 education:

- Does the activity protect or directly support the U.S. constitutional and legislated rights of students to receive equal opportunity to a high-quality education?
- Does the activity apply to the entire nation and is it more efficiently and effectively delivered by the federal government rather than by states and districts?

Implementing these criteria would focus the federal role on ensuring equity and providing needed additional resources without dictating one-size-fits-all prescriptions of education practice to states, districts, and schools. Four types of current activities could meet these criteria:

- **Protecting and supporting the rights of all students to equal educational opportunity.** The Office of Civil Rights has been more active in the past 8 years than in the early years of this millennium. This should continue but with greater emphasis going forward on a support function for the agency rather than the enforcer role for which it has been mainly known.
- **Ensuring equal opportunity for students protected under federal law** through such programs as the Education for all Handicapped Act, Title III of ESEA, and programs for Native American students. These programs should probably undergo expert reviews to make sure that they have the structures and the resources needed to innovate and support greater opportunities for their targeted populations, especially in light of recent research on teaching and learning.
- **Reducing resource inequities.** This function occurs primarily through Title I of ESEA, which allocates federal dollars to schools serving students from low-income families. Title I is currently in a period of transition from the highly prescriptive and punitive provisions under NCLB, but it is not yet clear how much of the prescriptive accountability approach will remain when the new regulations for ESSA go into effect. To help accelerate equity and improvement, Title I funding should be increased,

targeted more narrowly to high-poverty schools, and freed of most of the legislative and regulatory strictures on its use, though comparability and supplement-not-supplant provisions should remain. Additional provisions and incentives might also help equalize resources across richer and poorer states or even jump-start more equitable approaches to school funding within states and districts.

- **Supporting research, innovation, and data for improvement.** The Department of Education should continue to support research and national data collection and analysis, focusing on improving teaching and learning and innovating in areas such as technology. These activities are truly national in scope and cannot be carried out efficiently by states and localities. The department also should support more theoretical and problem-based work to aggregate knowledge and deepen understanding of the key factors in developing and sustaining more effective and equitable education systems.

Zeroing in on these four functions while reducing or eliminating other federal actions could help create more favorable conditions for local and state action that responds more effectively to the diversity of American educational contexts.

The State Role. The states' constitutionally enabled role in education—embracing everything from governance, finance, and curriculum to supporting, enhancing, and monitoring quality in education—is in practice shared with districts. But states typically create the legislative and regulatory framework that guides districts and make decisions about content and performance standards, teacher certification, accountability, assessments, and data collection. States also oversee both federal and state programs for protected categories of students and create the framework for school finance.

This system works to some degree and for some students, but for more than a century, it has perpetuated well-documented discrimination against students from low-income families and students of color. To move resolutely toward the goal of equal opportunity for all, states must develop, maintain, and improve well-functioning education systems for all schools and students throughout the state. If the system is dysfunctional, the least advantaged among us will suffer the most. To shore up the documented racial- and poverty-related gaps in finance, teacher preparedness, and other resources, states could take on four broad roles or tasks:

- **Establishing a vision, standards, and priorities.** Adopting and supporting implementation of a new generation of standards and assessments and aligning them to policies pushing in the same direction in curriculum development, educator training, and accountability are vital to successful education reform. Equally important is ensuring that local districts receive consistent signals from system leaders and that state leaders exhibit a steadfast commitment to improvement.

- **Providing human capital resources.** Visions and plans vaporize without infrastructure and other resources. Most states face serious human capital issues that hold back improvement and perpetuate inequality. These include teacher shortages, inadequate preservice training, limited capacity of current teachers for teaching the new content or teaching all students, and a limited supply of well-trained principals. Moreover, the challenge of creating and maintaining a continuous improvement environment and implementing a thoughtful intervention system requires changing the responsibilities of educators throughout the system. States are well positioned to ensure that all students have access to high-quality and effective personnel by supporting the recruitment of talented and committed people to enter the profession, fostering infrastructure to support teachers and principals to grow in their jobs, and ensuring equitable access for all children to high-quality teachers and other education professionals.
- **Ensuring adequate and fair funding.** In 22 states, more than half of the funding for education comes from state coffers. Ensuring that funding levels are adequate and adopting and implementing a statewide weighted student formula or similar approach that allocates funds based on student need can go a long way toward addressing current disparities in educational resources among districts. States also could take steps to stimulate within-district equalization. And they could incorporate additional support for students at high risk who fall outside the protected categories of race or poverty: 4% to 6% of the nation's students are in foster homes (400,000), have one or both parents who are incarcerated (2.7 million), are homeless (500,000 in any given year), or suffer from a serious mental disorder (an estimated 4 million).
- **Establishing a data system and accountability approach that support improvement.** As the locus of education accountability continues to shift from the federal government to state governments, the new watch-phrase should be reciprocal accountability. Too often in the past, teachers' and schools' feet were held to the fire when federal- or state-set performance goals weren't met. Districts, in contrast, rarely suffered consequences, especially for failing to adequately fund and support low-performing schools. This situation must change if accountability is to be useful in engendering change. And to do so requires data not only on student outcomes but also on the processes and resources employed to produce those outcomes, a basic requirement for continuous improvement methodologies.

The District Role. Of all the levels of governance, local districts have the most direct influence on what happens in schools. How they allocate resources, set instructional policy, establish infrastructure to support learning and ensure equity, and recruit and support teachers varies hugely from district to district, depending on district size, resources, and professional capacity and student body composition. Two thirds of the

13,500 districts in the U.S. have fewer than 1,500 students and rely heavily on regional or county educational offices to help carry out these functions. Today, support from these offices often conflicts with and is trumped by their regulatory responsibilities. But if federal and state governments emphasize compliance less and support more, local and regional entities could more easily follow suit where it matters most—in our schools.

Four opportunities to motivate and support quality and equality locally stand out as particularly important:

- **Creating a culture of continuous improvement.** Steady gains in learning and achievement cannot be expected without common goals and metrics to measure progress. New data systems are now available in many states and districts. Dashboards reflecting multiple measures, support for cross-school and cross-functional collaboration and learning, and a culture of trust in which failures are construed as learning opportunities are also part of this educational model.
- **Ensuring strategic and equitable resource allocation.** A second critical task is to clearly align the district's budgeting with its goals. Equitable resource allocation must reflect student and school needs, affording openings to expand on successes and prune away failures. This effort will often require hard decisions and substantial budgetary changes.
- **Developing human capital**. Human capital is the foundation of continuous improvement in education. Educator quality is a goal throughout the educational system, but recruitment, tenure, assignment, and evaluation decisions are local, as are most recruitment pools. (See Box 3.)
- **Engaging the community.** Engaging the public, managing local education politics effectively, and connecting schools and students with social services rounds out the local district role. Rapid turnover among board-appointed superintendents also points to the need to work more closely with school boards, which are often politically freighted stepping stones to higher elected offices and which can help or hinder program implementation.

While governmental policy and action at these three levels could help to motivate and support educational improvement and equity, too many papers about addressing disparities in educational opportunities begin and end with an argument about policy, as if passing or enforcing a few laws and allocating funds will change the schooling experiences of currently underserved students sufficiently to fulfill the promise of equal opportunity.

This singular focus on policy for engendering the needed changes has two flaws. First, as the federal government's current polarization demonstrates, it is often very difficult to obtain agreement among elected officials to move in a coherent and productive direction

BOX 3. HUMAN CAPITAL DEVELOPMENT IN GARDEN GROVE[12]

Garden Grove Unified School District (GGUSD) in southern California serves a student population of approximately 45,000, 77% of whom are from low-income families and 41% of whom are English learners. The 2004 winner of the Broad Prize for Urban Education, GGUSD attributes much of its success to its efforts to attract and support the highest quality teachers to serve its diverse student population. GGUSD's comprehensive approach to human capital development centers on getting the best teachers possible, building their capacity, and instilling a culture of improvement throughout all aspects of the district's work. Strategies for attracting high-quality teachers include approaches to recruitment and student teaching that allow the district to prepare and assess prospective teaching talent. Then, hiring, placement, and induction emphasize multiple opportunities for feedback and socialization into the professional culture and the high expectations of the district before a well-informed and selective tenure decision is made. Once in the district, teachers are well compensated and supported through a comprehensive approach to professional learning (both individual and collaborative), instructional supervision and feedback, and opportunities for teacher leadership.

But GGUSD's success may be less about the specifics of its human capital strategies than about the culture that the district has created and perpetuates though those strategies. Built on a foundation of respect and personal relationships, collective problem solving, and deep commitment to the well being and learning of each and every child, GGUSD's culture combines caring and improvement. The district's recognition of its important role in human capital development is encapsulated in the former superintendent's slogan, "You'll never be better than your teachers."

or exercise restraint and focus in their policymaking. That the reauthorization of ESEA was 8 years behind schedule is hardly surprising given these circumstances. And the politics in many statehouses is as problematic as it is in Washington, D.C. This suggests that additional sources of pressure and support—sometimes directed at policymakers themselves—might be needed.

Second, even under the best and most focused and coherent of policy environments, the power of policy is limited in improving what actually goes on inside schools and classrooms. For that, the active and committed engagement of the education profession itself is necessary.

Increasing Professional Accountability and Support

Decades of policy implementation research have demonstrated that teaching is too complex to be governed by bureaucratically defined rules and routines. Teachers not only require specialized knowledge, as do all professionals, but also must be able to apply their knowledge and skills in specific contexts (different students, content areas, and school settings) to the benefit of their clients (students). Mature professions encapsulate the requisite knowledge in professionally determined standards of practice, and members of the profession assume responsibility for defining and enforcing the standards. This is professional accountability.

Professional accountability can motivate and support continuous improvement in education. The focus on instructionally relevant processes and student outcomes sets the stage for continuous improvement cycles, the emphasis on professional knowledge increases the odds that educators can interpret and act on the information they generate or receive, and professional collaboration can validate or challenge educators' assumptions about effective practices and students' capabilities. Professional accountability also expands incentives for improvement, especially by drawing on the core motivation to teach.

Historically, the education profession in the U.S. has been a much weaker source of either pressure or support than its counterparts in many other countries, and American professional associations have not been among the most consistent advocates for equity. That situation is starting to change. The recent emergence of professional learning communities manifests the potential of professional capital and accountability. In California's Sanger Unified School District, communities of practice address a shared practical problem, plan how to address it, do what they set out to do, and then study the results. Four key questions inform the improvement strategy: What do we want our students to learn? How will we know when they have learned it? How will we respond if they haven't learned? And how will we respond if they have? Other districts have instituted similar plan-do-study-act cycles.

Professional associations and networks also develop and diffuse the field's norms and practices, which makes them excellent vehicles for taking continuous improvement and professional learning communities to scale across districts and states. The National Council of Teachers of Mathematics and the California Subject Matter Projects have both changed teaching practices and norms and kept communication lines among professionals from different disciplines open.

In a similar mode, networks of schools or districts—such as California's 10 CORE districts, which share common metrics and activities to implement the Common Core State Standards, increase achievement, and reduce disparities—foster mutual learning and improvement.

Notably, as important as these formal structures are to progress toward excellence and equity, it is the professional learning and relationships within them that drive the work from person to person, school to school, and district to district.

Mobilizing an Engaged Citizenry

Too many equity-promoting reforms have fallen on the sword of partisan politics and public pushback. Often, deep-seated beliefs about meritocracy, the scarcity of educational goods, and the innate abilities of some children get in the way. And the ambient power structure can preserve advantages for wealthier and more privileged communities at the expense of less-well-off communities or the nation as a whole. But this is not the way it has to be.

Working together, broad swaths of educators, higher education institutions, employer associations, parent organizations, advocacy and civil rights groups, health care and community organizations, and others can change this picture. Pioneered by the Strive Together Initiative in Cincinnati, Ohio, new collective impact strategies that zero in on intractable and complex social problems have led to transformative changes. They bring data to bear on decision making and continually weigh the impacts of decisions on its own institutions and the larger educational ecosystem.

The prototypical collective impact approach involves establishing a shared community vision, instituting evidence-based decision making and shared accountability among partners to improve selected outcomes, using continuous improvement to identify and spread promising practices, and aligning financial and other resources to support and sustain improvement. Thanks to ample coordination across sectors and organizations, such strategies can incubate and support major social change better than individual organizations and agencies can. They also can help sustain direction and activity during leadership changes that so often derail the equity and improvement agendas. Collective impact approaches have become more popular for addressing major social problems, including those in education.

Along with collective impact strategies and other *grass-tops* approaches to educational and community change, *grassroots* organizing can keep up the pressure on policymakers, local education leaders, and others to provide full opportunities to students in high-poverty communities and communities of color. And this work isn't always or strictly adversarial. In California, local organizing efforts were instrumental in raising new state monies for education and in passing a new funding system that allocates resources more equitably to districts, based on student need. Combining grass-tops collective impact strategies and grassroots organizing into a new social movement for equal opportunity may be the only way to ensure that the other sources of pressure and support—particularly governmental policy—are mobilized to generate and sustain a more equitable and high-quality system for all students.

Conclusion

Many opportunities are emerging for acting on the theory of change proposed here. One is the current authorization of ESEA, known as ESSA, which reduces the federal constraints of NCLB and at least suggests a stronger focus on support over punitive approaches to accountability. Another is the increasing interest across the country in continuous improvement strategies supported by collaboration and professional networking, along with growing examples of their use and data on the resulting improvements for students. A third opportunity lies in the signs of growing activism among young people focused on social justice, despite the deeply divided and generally paralyzed federal policy environment. Finally, more and more educators, policymakers, and others are realizing the importance of addressing the full range of children's needs and attending to their social and emotional development as the basis for not only school success but also success in career and civil participation. For these reasons, the goals and strategies proposed here (and in the longer work it summarizes) could have broad bipartisan appeal. The challenge will be to make a compelling argument that convinces educators and the public that the changes are necessary, urgent, important, and possible.

Endnotes

1. O'Day, J. A., & Smith, M. S. (2016). Quality and equality in American education: Systemic problems, systemic solutions. In I. Kirsch & H. Braun (Eds.), *The dynamics of opportunity in America: Evidence and perspectives.* New York, NY: Springer International.
2. This figure is for children whose families live below the official poverty line ($24,250 for a family of four in 2015). However, *more than half* of U.S. public school students are eligible for free or reduced-price lunches (often used as a proxy for low income) because they live in households whose income is less than 185% of the poverty threshold.
3. Except where otherwise noted, citations for the information presented throughout this brief are available in the original published version, available at http://link.springer.com/chapter/10.1007/978-3-319-25991-8_9. Citations for updated data are included in endnotes.
4. See http://www.ed.gov/news/press-releases/us-high-school-graduation-rate-hits-new-record-high-0
5. Defined as eligible for free and reduced-price meals.
6. A third observation worth noting is that the gains during the past 2 decades seem to be concentrated between the mid-1990s and the early 2000s, tapering off during the period of punitive accountability under the No Child Left Behind Act (NCLB). This pattern is instructive in discerning lessons for future policy.
7. See Park, S., Hironaka, S., Carver, C., & Lee, N. (2012). *Continuous improvement in education.* Stanford, CA: Carnegie Foundation for the Advancement of Teaching.
8. See Weast, J. D. (2014). Confronting the achievement gap: A district-level perspective. In K. McCartney, H. Yoshikawa, & L. B. Forcier (Eds.), *Improving the odds for America's children: Future directions in policy and practice.* Cambridge, MA: Harvard Education Press.
9. For a more complete discussion of Fresno's equity and access work, see Haxton, C., & O'Day, J. (2015). *Improving equity and access in Fresno: Lessons from a K–12 higher education partnership.* Washington, DC: American Institutes for Research.
10. Allensworth, E. (2013). The use of ninth-grade early warning indicators to improve Chicago schools. *Journal of Education for Students Placed at Risk, 18*(1), 68–83.
11. More recent data from the California Department of Education show even larger gains. Between 2013–14 and 2014–15, Fresno's graduation rate increased by 4.5 percentage points, compared to a 1.3 percentage point gain for the state as a whole. Fresno's rate (83.8%) now exceeds that of the state (82.3%).
12. For a case study of Garden Grove's human capital system, see Knudson, J. (2013). *You'll never be better than your teachers: The Garden Grove approach to human capital development.* San Mateo, CA: The California Collaborative on District Reform.

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Should non-cognitive skills be included in school accountability systems? Preliminary evidence from California's CORE districts

Martin R. West

Executive Summary

Evidence confirms that student skills other than academic achievement and ability predict a broad range of academic and life outcomes. This evidence, along with a new federal requirement that state accountability systems include an indicator of school quality or student success not based on test scores, has sparked interest in incorporating such "non-cognitive" or "social-emotional" skills into school accountability systems.

Yet important questions have been raised about the suitability of extant measures of non-cognitive skills, most of which rely on asking students to assess their own abilities, for accountability purposes. Key concerns include the possibility of misleading information due to reference bias in students' self-reports and that students may simply inflate their self-ratings to improve their school's standing once stakes have been attached.

The most ambitious effort to deploy common measures of non-cognitive skills as part of a performance management system is unfolding in California's CORE Districts, a consortium of nine school districts that collectively serve over one million students. In the 2014-15 school year, CORE conducted a field test of measures of four social-emotional skills involving more than 450,000 students in grades 3-12. Starting this year, information from these measures will be publicly reported and is expected to play a modest role in schools' performance ratings, comprising eight percent of overall scores.

Analysis of data from the CORE field test indicates that the scales used to measure student skills demonstrate strong reliability and are positively correlated with key indicators of academic performance and behavior, both across and within schools. These findings provide a broadly encouraging view of the potential for self-reports of social-emotional skills as an input into its system for evaluating school performance. However, they do not address how self-report measures of social-emotional skills would perform in a high-stakes setting – or even with the modest weight that will be attached to them within CORE. The data currently being gathered by CORE provide a unique opportunity for researchers to study this question and others related to the role of schools in developing student skills and the design of educational accountability systems.

A growing body of evidence confirms that student skills not directly captured by tests of academic achievement and ability predict a broad range of academic and life outcomes, even when taking into account differences in cognitive skills.[i] Both intra-personal skills (such as the ability to regulate one's behavior and persevere toward goals) and inter-personal skills (such as the ability to collaborate with others) are key complements to academic achievement in determining students' success. This evidence, in combination with a new federal requirement that state accountability systems include an additional indicator of school quality or student success not based on test scores, has sparked widespread interest in the possibility of incorporating such "non-cognitive" or "social-emotional" skills into school accountability systems.

At the same time, important questions have been raised about the suitability of extant measures of non-cognitive skills, most of which rely on asking students to assess their own abilities, for accountability purposes. In a 2015 paper in *Educational Researcher*, leading psychologists Angela Duckworth and David Yeager offer what they describe as a "simple scientific recommendation regarding the use of currently available personal quality measures for most forms of accountability: not yet."[ii]

Duckworth and Yeager identify three key concerns with the use of student self-reports of non-cognitive skills into accountability systems. The first stems from the fact that students evaluating their own skills must employ an external frame of reference in order to reach a judgment about their relative standing. As a result, differences in self-reports may reflect variation in normative expectations rather than true differences in skills, a phenomenon known as "reference bias."[iii] To the extent that students attending schools with more demanding expectations for student behavior hold themselves to a higher standard when completing questionnaires, reference bias could make comparisons of their responses across schools misleading. If schools with high expectations are actually more effective in improving students' non-cognitive skills (something not yet known but often assumed), conclusions about school performance based on self-reports could even be precisely backward.

Duckworth and Yeager's second concern is more obvious: that students may simply inflate – or be coached to inflate – their self-ratings to improve their school's standing once stakes have been attached. Finally, they note that we have little evidence on the ability of these measures when aggregated to the school level to distinguish statistically between schools with high and low levels of performance – something that depends on both the reliability of the measures and the extent to which students in the same school tend to respond in similar ways.

These concerns are worth taking seriously, especially when voiced by scholars who have done so much to enrich our understanding of the skills students need to succeed in the classroom and beyond. My own research has suggested the potential importance of reference bias due to differences in school climate, leading me to caution in this series against proposals to incorporate survey-based measures of non-cognitive skills into high-stakes accountability systems.[iv]

In addition to the concerns emphasized by Duckworth and Yeager, I would note the risk that deploying superficial measures of non-cognitive skills might lead to superficial instructional responses. Setting aside intentional faking, there's clearly a difference between thinking of oneself as having strong self-management skills or a high level of social awareness and actually being able to demonstrate those capacities in one's daily life, including in novel situations and environments.

Yet a few school systems are moving forward with using student self-reports to systematically track the development of non-cognitive skills and even with including them as a component of school accountability systems; others may well follow. This is understandable, given the ways in which the importance of these skills has been promoted. One of Duckworth's seminal papers on self-control, for example, is entitled "What No Child Left Behind Leaves Behind: The Roles of IQ and Self-Control in Predicting Standardized Achievement Test Scores and Report Card Grades."[v]

It is also, in my view, a positive development. Above all, it presents an enormous learning opportunity for the field – a chance to study not only the properties of the measures when administered at scale and how, if at all, they change once stakes are attached, but also schools' role in developing non-cognitive skills and effective strategies to improve them. To the extent that there is skepticism about the value of student self-reports for school accountability, it presents an opportunity to subject that skepticism to an empirical test. Educational accountability systems serve many purposes, one of which is to signal to educators what is important in a way that will lead to desired changes

in instructional practice. Are we really so sure that the inclusion of measures of non-cognitive skills in such a system can't play a constructive role? And might not the use of current measures, despite their potential flaws, help drive the development of new and better ones?

Easily the most ambitious effort to deploy common measures of non-cognitive skills as part of a performance management system is unfolding in California's CORE Districts, a consortium of nine school districts that collectively serve over one million students in more than 1,500 schools.[vi] Six of these districts have been operating since 2013 under a waiver from the U.S. Department of Education to implement an accountability system that aims to be both more holistic and more useful for improving practice than they believe is possible based on test scores alone. In addition to student proficiency and growth as measured by state tests, the inputs into CORE's School Quality Improvement Index (SQII) include such indicators as suspension and expulsion rates, chronic absenteeism, and school culture and climate surveys administered to students, teachers, and parents. The most distinctive feature of the SQII, however, is the plan eventually to incorporate self-report measures of what CORE refers to as students' social-emotional skills directly into school performance ratings.

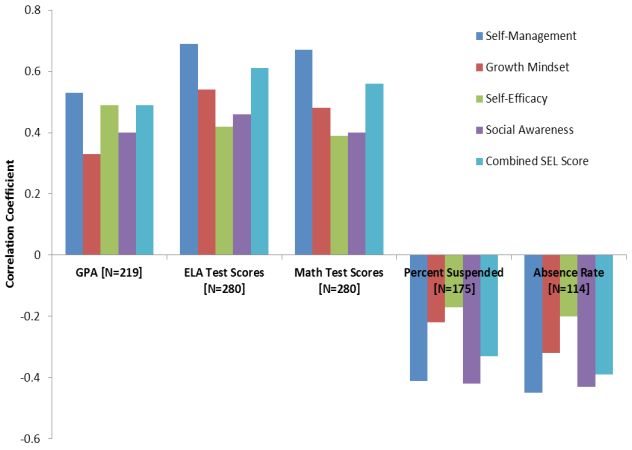
CORE has approached the development of this component of its accountability framework in a cautious, thoughtful manner. Working with a partner organization known as Transforming Education, they selected the specific social-emotional skills on which to focus based on a review of evidence on the extent to which those skills are measurable, meaningfully predictive of important academic and life outcomes, and likely to be malleable through school-based interventions. This process was constrained by a commitment to limit the total assessment burden on students to less than 20 minutes each spring, and ultimately led them to settle on four skills: self-management, social awareness, self-efficacy, and growth mindset (see Appendix Table 1). After piloting the collection of measures of those skills in a small number of schools during the 2013-14 school year, including conducting multiple experiments to compare the performance of alternative survey items, CORE conducted a broader field test involving more than 450,000 students in grades 3-12 the following spring. Starting with the 2015-16 school year, information from these measures will be publicly reported and is expected to factor into school performance ratings – but in a very modest way, comprising just eight percent of the scores schools receive on the SQII. Perhaps most important, CORE has made both the student survey data and district administrative data available to independent researchers at the John W. Gardner Center and Policy Analysis for California Education at Stanford and Harvard's Center for Education Policy Research (CEPR).

My CEPR colleagues and I have used data from the 2014-15 field test to perform preliminary analyses of the reliability of students' survey responses and their validity, when aggregated to the school level, as an indicator of school performance.[vii] With respect to reliability, we first examined the extent to which students' responses to specific items used to measure the same skill were correlated, as would be expected to be the case if they captured a common underlying construct. Across all students in grades 3-12, we found that three of the four of the scales demonstrated strong internal reliability. The exception was the scale used to measure growth mindset, which had an internal reliability coefficient of 0.7, somewhat below the commonly used benchmark for acceptable reliability of 0.8. A closer inspection of the data suggested that the reliability of each scale, and in particular the scale measuring growth mindset, was pulled down by lower inter-item correlations among the youngest students completing the survey – those in the third and fourth grades. This may indicate that students below grade five struggled to understand some survey items or are less well-positioned to assess their own skills, and CORE is currently in the process of deciding which grades it will ultimately include. Overall, however, the scales performed well along this dimension, both overall and for important student subgroups such as English language learners and students with disabilities.

CORE selected its measures of social-emotional learning based on evidence from other settings that they were valid predictors of academic success. Do those same relationships hold when administered at scale in its districts? Figure 2 shows the correlations between school-average social-emotional skills and key indicators of academic performance (GPA and state test scores) and student behavior (the percentage of students receiving suspensions and average absence rates) across CORE district middle schools.[viii] As expected, social-emotional skills are positively related with the academic indicators and negative correlated with the two indicators of student (mis-) behavior, with the correlations for academic indicators ranging from 0.33 to 0.69. The strongest relationships

with academic indicators are observed for self-management, a pattern consistent with other research, while self-management and social awareness are equally important predictors of behavior.

Figure 1. School-level correlations of average student social-emotional skills and indicators of academic performance and behavior for CORE district middle schools



Note: All correlations are statistically significant at the 95 percent confidence level or higher. ELA and math test scores are standardized by grade and subject level. GPAs are standardized within district due to variation in scales. Combined SEL Score is an equally weighted average of the four other scales. Schools with fewer than 25 students with valid survey responses excluded.

Figure 2 illustrates the strong correlation between CORE's summary social-emotional learning measure (the average of the four scales) and English language arts (ELA) achievement, but also reveals ample dispersion of schools around the regression line.[ix]

Figure 2: School-level relationship between combined social-emotional learning (SEL) measure and English language arts (ELA) test scores for CORE district middle schools

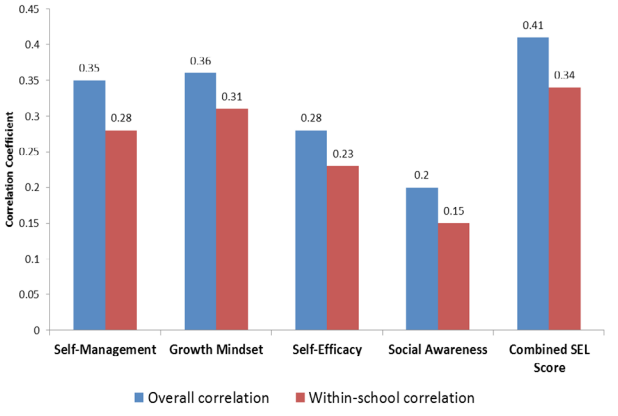
Note: ELA test scores and SEL skills are standardized by grade. Schools with fewer than 25 students with valid survey responses excluded.

In other words, students in some middle schools in which academic performance (as measured by ELA test scores) is high report relatively low social-emotional skills, and vice versa. On one hand, this could reflect authentic variation in performance across academic and social-emotional domains – and therefore the value of a more holistic indicator. On the other, it could be that students in some schools rate their social-emotional skills more critically than in others, perhaps due to variation in norms across schools that leads to reference bias.

To probe for evidence of reference bias, we compared the strength of the student-level correlations between social-emotional skills and academic indicators overall (i.e., across all students attending CORE middle schools) with those obtained when we limit the analysis to comparisons of students attending the same school. The logic of this exercise is straightforward: If students in higher-performing schools rate themselves more critically, then average self-ratings in those schools will be artificially low. This would cause the overall correlation to be biased downward, and lower than that observed among students responding to surveys within the same school environment.

Figure 3 shows the results of this comparison for ELA test scores.[x] It shows that the overall and within-school correlations do differ modestly but that the former are stronger than the latter – precisely the opposite pattern that would result from systematic reference bias due to varying expectations.

Figure 3. Student-level correlations between social-emotional skills and English language arts (ELA) test scores in CORE district middle schools, overall and within schools



Note: N=110,293. All correlations and all differences between overall and within-school correlations are statistically significant at the 99 percent confidence level or higher. ELA test scores are standardized by grade and subject level.

To be sure, this analysis does not rule out the possibility that reference bias may lead to misleading inferences about specific schools with particularly distinctive environments. It does, however, provide some preliminary evidence that the form of reference bias that would be most problematic in the context of a school accountability system may not be an important phenomenon in the CORE districts as a whole.

In sum, our preliminary analysis of the data from CORE's field test provides a broadly encouraging view of the potential for self-reports of social-emotional skills as an input into its system for evaluating school performance. That said, the view it provides is also quite limited. It says nothing about how self-report measures of social-emotional skills would perform in a high-stakes setting – or even with the very modest weight that will be attached to them this year within CORE.[xi] Nor can we say anything about how CORE's focus on social-emotional learning will alter teacher practice and, ultimately, student achievement. The results presented above are best thought of as a baseline for future analysis of these issues – and many more.

One reason researchers don't have much to say about these questions currently is that the No Child Left Behind Act effectively required all fifty states to adopt a common approach to the design of school accountability systems. Fifteen years later, we know a lot about the strengths of this approach and even more about its weaknesses – but next to nothing about those of potential alternatives. The recently enacted Every Student Succeeds Act provides both opportunity and incentive for experimentation. What is important is that we learn from what happens next. We need to let evidence speak.

Appendix Table 1. Social-emotional skills assessed by the CORE Districts

Skill	Definition	Sample item
Self-management	The ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, delaying gratification, motivating oneself, and selecting and working toward personal and academic goals.	Please answer how often you did the following during the last 30 days. During the past 30 days... I remained calm even when criticized or otherwise provoked.
Growth mindset	The belief that one's abilities grow with effort. Students with a growth mindset see effort as necessary for success, embrace challenges, learn from criticism, and persist in the face of setbacks.	Please indicate how true each of the following statements is for you: My intelligence is something that I can't change very much.
Self-efficacy	The belief in one's ability to succeed in achieving an outcome or reaching a goal. Self-efficacy reflects confidence in the ability to exert control over one's motivation, behavior, and environment.	How confident are you about the following at school? I can do well on my tests even when they are difficult.
Social awareness	The ability to take the perspective of and empathize with others from diverse backgrounds and cultures, to understand social and ethical norms for behavior, and to recognize family, school, and community resources and supports.	During the past 30 days... How carefully did you listen to other people's points of view?

Note: Definitions and items are drawn from CORE Districts documents available at http://coredistricts.org/school-quality-improvement-system-waiver/.

[i] Almlund, M., Duckworth, A. L., Heckman, J. J., & Kautz, T. D. (2011). Personality psychology and economics. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), Handbook of the economics of education. (vol. 4) (pp. 1-181). Amsterdam: Elsevier, North-Holland; Duckworth, A. L., Tsukayama, E., & May, H. (2010). Establishing causality using hierarchical linear modeling: An illustration predicting achievement from self-control. Social Psychological and Personality Science 1(4), 311-317.

[ii] Duckworth, A. L., & Yeager, D. S. (2015). Measurement matters assessing personal qualities other than cognitive ability for educational purposes. Educational Researcher, 44(4), 237-251. In a recent New York Times interview, Duckworth was even more emphatic, telling the reporter: "I do not think we should be doing this; it is a bad idea."

[iii] Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective likert scales? The reference-group effect. Journal of Personality and Social Psychology, 82(6), 903-918.

[iv] West, M. R., Kraft, M. A., Finn, A. S., Martin, R. E., Duckworth, A. L., Gabrieli C. F. O., & Gabrieli J. D. E. (2016). Promise and paradox: Measuring non-cognitive traits of students and the impact of schooling. Educational Evaluation and Policy Analysis, 38(1), 148-170.

[v] Duckworth, A. L., Quinn, P. D., & Tsukayama, E. (2012). What No Child Left Behind leaves behind: The roles of IQ and self-control in predicting standardized achievement test scores and report card grades. Journal of educational psychology, 104(2), 439.

[vi] For more information on the CORE Districts, which include Fresno, Garden Grove, Long Beach, Los Angeles, Oakland, Sacramento, San Francisco, Sanger, and Santa Ana Unified School Districts, see http://coredistricts.org/why-is-core-needed/core-districts/.

[vii] West, M. R., Scherer, E., & Dow, A. (2016). Measuring social-emotional skills at scale: Evidence from California's CORE Districts. Paper presented at the American Education Finance and Policy Annual Conference.

[viii] We observe broadly similar relationships for elementary and high schools.

[ix] The fact that the dispersion of school-average test scores in Figure 2 is higher among schools with higher average SEL skills reflects the fact that students in smaller schools tend to report higher SEL skills.

[x] We obtain a comparable pattern of results for GPA and math test scores.

[xi] Due to recent changes in federal policy, the identification of schools for comprehensive support and improvement under the Every Student Succeeds Act is likely to be based on performance metrics available statewide, rather than on the SQII.

FOR RELEASE OCTOBER 6, 2016

The State of American Jobs

How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead

Based on a Pew Research Center survey conducted in association with the Markle Foundation

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Terminology

In data based on the Current Population Survey, “employed” Americans are those who were at work in the week prior to the survey or who were temporarily absent from their job. In data based on the Current Employment Statistics survey, “employed” Americans are those who are on non-farm payrolls who received pay for any part of the pay period that includes the 12th day of the month, including those on paid leave. Persons are counted in each job they hold. In data from the Pew Research Center surveys, “employed” Americans are those who say they work full or part time, unless otherwise noted. “In the labor force” is used to describe those who are either employed or are unemployed but are looking for work.

Employed respondents were asked how many jobs they have. If they said they have more than one, they were asked if they consider one to be their primary job. Respondents who reported having more than one job and don’t consider one to be their primary job were not asked most subsequent questions about their current job. Those who said they have more than one but consider one to be their primary job were asked to think about only their primary job when answering questions about their current job. See topline questionnaire for details on how each question was filtered.

Throughout this report, “four-year degree” and “bachelor’s degree” are used interchangeably. Similarly, “a bachelor’s degree or more” and “at least a bachelor’s degree” convey the same level of educational attainment. Unless otherwise noted, “some college” includes those with a two-year degree or those who have attended college but did not complete a degree. “High school” refers to those who have attained a high school diploma or its equivalent, such as a General Education Development (GED) certificate.

References to whites, blacks and Asians include only those who are non-Hispanic, unless otherwise noted, and identify themselves as only one race. Hispanics are of any race. In Chapters 2 to 5, Asians are not analyzed separately due to small sample size.

The State of American Jobs

How the shifting economic landscape is reshaping work and society and affecting the way people think about the skills and training they need to get ahead

Tectonic changes are reshaping U.S. workplaces as the economy moves deeper into the knowledge-focused age. These changes are affecting the very nature of jobs by rewarding social, communications and analytical skills. They are prodding many workers to think about lifetime commitments to retraining and upgrading their skills. And they may be prompting a society-wide reckoning about where those constantly evolving skills should be learned – and what the role of colleges should be.

A new Pew Research Center survey, conducted in association with the Markle Foundation, finds that these new realities are not lost on the American public: The vast majority of U.S. workers say that new skills and training may hold the key to their future job success.

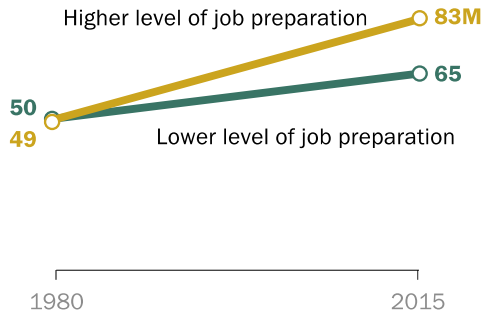
That sentiment is echoed in a new Pew Research Center analysis of government jobs data, which finds that for the past several decades, employment has been rising faster in jobs requiring higher levels of preparation – that is, more education, training and experience.

The number of workers in occupations requiring average to above-average education, training and experience increased from 49 million in 1980 to 83 million in 2015, or by

How economic change is reshaping the workplace

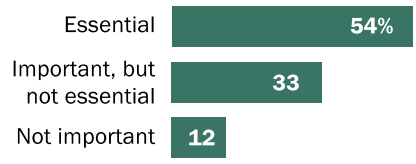
Employment is rising faster in occupations requiring more preparation ...

Number employed, in millions



... and most workers see continuous training as essential or important to career success

% saying training/skills development throughout their work life will be ...



Note: Employment data (top panel) are based on civilians ages 16 and older who are currently employed. "Job preparation" is a combination of education, experience and training. Survey findings (lower panel) are based on adults (ages 18+) who are in the labor force.
Source: Employment data are based on a Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS). Opinion data are from a survey of U.S. adults conducted May 25-June 29, 2016.
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68%. This was more than double the 31% increase over the same period in employment, from 50 million to 65 million, in jobs requiring below-average education, training and experience.[1]

At the same time, the national survey – conducted May 25 to June 29, 2016, among 5,006 U.S. adults (including 3,096 employed adults) – shows how deeply Americans have internalized these trends:

Many see personal upgrading as a constant: More than half (54%) of adults in the labor force say it will be essential for them to get training and develop new skills throughout their work life in order to keep up with changes in the workplace. And 35% of workers, including about three-in-ten (27%) adults with at least a bachelor's degree, say they don't have the education and training they need to get ahead at work. Many are already taking action or being required to do so by their employer or by licensing requirements in their jobs: 45% of employed adults say they got extra training to improve their job skills in the past 12 months.

The public sees threats to jobs coming from several directions: Eight-in-ten adults say increased outsourcing of jobs to other countries hurts American workers, and roughly the same share (77%) say having more foreign-made products sold in the U.S. has been harmful. Significant shares also cite increased use of contract or temporary workers (57%) and declines in union membership (49%) as trends that are hurting, rather than helping, workers. At the same time, global markets for U.S.-made products are seen as helpful for workers by 68% of adults. And seven-in-ten say the rise of the internet and email has been a net positive.

Americans think the responsibility for preparing and succeeding in today's workforce starts with individuals themselves: Roughly seven-in-ten (72%) say "a lot" of responsibility falls on individuals to make sure that they have the right skills and education to be successful in today's economy. And 60% believe public K-12 schools should bear a lot of responsibility for this. After that, views differ on the roles that other entities, such as companies and different levels of government, should play in preparing people for the workforce.

The role of college is being debated: While many college graduates with two- or four-year degrees describe their own experience as having a positive impact on them, just 16% of all Americans think that a four-year degree prepares students very well for a well-paying job in today's economy. And

[1] The level of preparation required by an occupation is based on ratings from the Department of Labor's Occupational Information Network (O*NET). In the O*NET data, the preparation required is rated on a scale of one (little or no preparation needed) to five (extensive preparation needed). This rating depends on a combination of education, experience, and other forms of job training. The mid-level preparation (rating of three) corresponds to an associate degree or a similar level of vocational training, plus some prior job experience and one to two years of either formal or informal on-the-job training (e.g., electricians). Above-average preparation typically calls for a four-year college degree and additional years of experience and training (e.g., lawyers).

there is no consensus regarding the main purpose of college. Roughly a third of adults (35%) say it should be to help individuals grow personally and intellectually, while 50% say it should be to teach job-related skills.

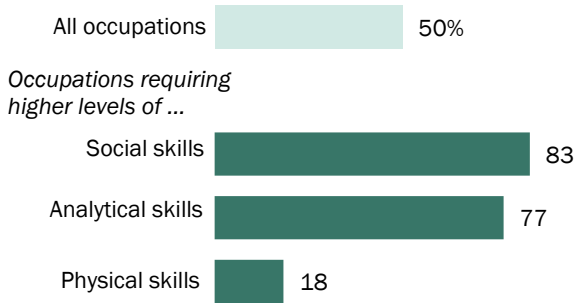
Overall, the survey findings and employment data show how Americans are hustling to adapt to new labor force realities. Some of the key themes in this two-pronged analysis:

The nature of jobs is changing, and women may be beneficiaries

The new analysis of employment data shows that the job categories with the highest growth tend to require higher social skills, analytic savvy and technical prowess. Since 1980, employment in jobs requiring stronger social skills, namely interpersonal, communications or management skills, increased from 49 million to 90 million, or 83%. Further, employment increased 77% (from 49 million to 86 million) in jobs requiring higher levels of analytical skills, including critical thinking and computer use. By comparison, the number of workers in jobs requiring higher levels of manual or physical skills, such as machinery operation and physical labor has changed relatively little.[2]

Employment growth is more rapid in occupations requiring higher social or analytical skills

% change in employment, 1980-2015



Note: Based on employed civilians ages 16 and older. Occupations requiring a higher level of a skill set are those with average to above-average ratings in the importance of the skill set to job performance. Because an individual occupation may require higher levels of more than one skill, the three categories of occupations are not mutually exclusive.
Source: Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS).
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A look at occupations by the combinations of skills suggests that jobs requiring *both* higher social and higher analytical skills, such as managerial or teaching jobs, are generally doing better than other jobs in terms of employment growth. Employment in these hybrid occupations has grown 94% since 1980 (from 39 million to 76 million), representing a higher growth rate than jobs requiring higher social skills or those calling for higher analytical skills.

[2] The importance of a given skill to a job is ascertained from the latest ratings in the Department of Labor's Occupational Information Network (O*NET). See Chapter 1 and Methodology for more details.

How we measured the changing need for skills in the workplace:

The analysis of job skills and preparation in this report is based on the U.S. Department of Labor's Occupational Information Network (O*NET), a database covering more than 950 occupations. Each occupation is rated on a series of dimensions, including the importance of various skills and the level of preparation needed to perform the job.

This report analyzes the changing demand for three major families of job skills – social, analytical and physical. Social skills encompass such things as writing, speaking, managing and negotiating. Examples of analytical skills are critical thinking, mathematics and computer programming. Physical skills include operating vehicles and machinery and repairing electronic equipment. Occupations were rated as requiring either an average to above-average level of each major skill type or a below-average level of each skill. The skill ratings utilize the latest available O*NET data and do not change over time. Changes in employment for occupations grouped by the importance of social, analytical and physical skills reflect the changing need for each skill. (Employment estimates are derived from the Current Population Survey (CPS); see Chapter 1 and Methodology for more details.)

Many occupations have overlapping skill requirements (e.g., it is important for postsecondary teachers to have higher levels of both social and analytical skills).

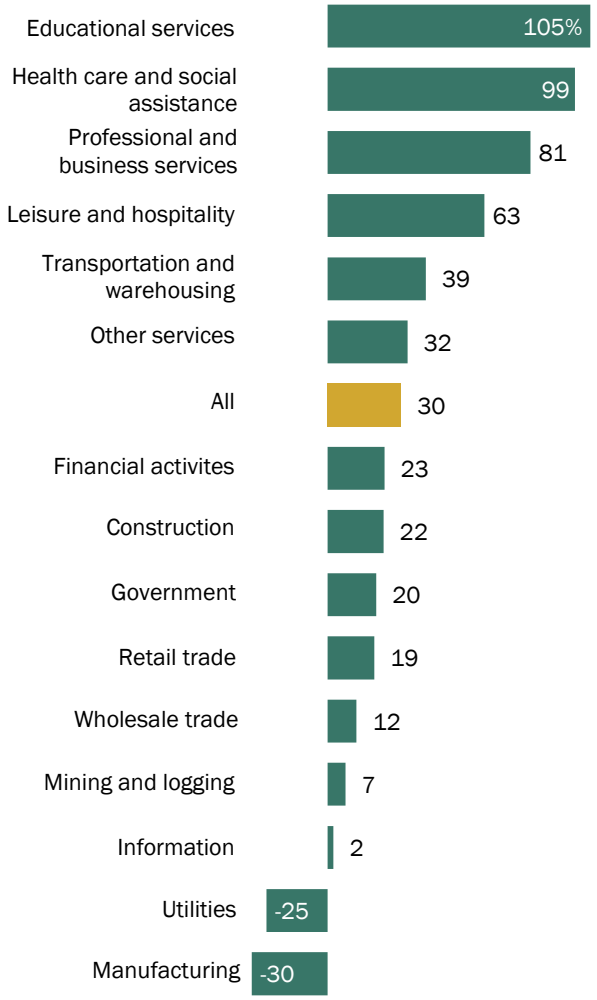
The analysis also uses O*NET data to examine the changing need for job preparation in the workplace. The level of preparation reflects the combination of education, experience and other forms of training needed on the job. Occupations were rated as requiring either an average to above-average level of preparation or a below-average level of preparation. The average level of preparation corresponds to an associate degree or a similar level of vocational training, plus some prior job experience and one or two years of either formal or informal on-the-job training (e.g., electricians).

The shifting demand for skills in the modern workplace may be working to the benefit of women. Women, who represent 47% of the overall workforce, make up the majority of workers in jobs where social or analytical skills are relatively more important, 55% and 52%, respectively. For their part, men are relatively more engaged in jobs calling for more intensive physical and manual skills, making up 70% of workers in those occupations. This is likely to have contributed to the shrinking of the gender pay gap from 1980 to 2015 given that wages are rising much faster in jobs requiring social and analytical skills.

These changes highlight the rise of a service-oriented and knowledge-based economy. From 1990 to 2015, employment growth in the U.S. was led by the educational services and health care and social assistance sectors. Employment has doubled in each of these sectors since 1990 (105% and 99%, respectively). By comparison, overall employment (non-farm) increased 30% during this period.

Over the past 25 years, employment growth has been most rapid in education and health services

% change in industry employment, 1990-2015



Note: "All" does not include farm employment.
Source: Pew Research Center analysis of U.S. Bureau of Labor Statistics Current Employment Statistics survey.
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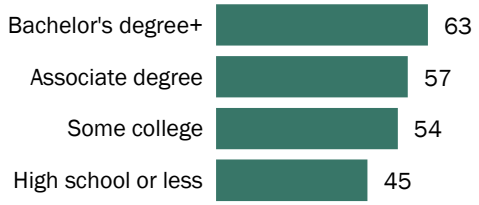
Most workers say they will need continuous training, and many say they don't have the skills they need now to get ahead in their job.

Fully 54% of adults who are currently in the labor force say that it will be essential for them to get training and develop new skills throughout their work life to keep up with changes in the workplace. An additional 33% say this will be important, but not essential. Only 12% of workers say ongoing training will not be important for them.

It's the most highly educated workers who feel this most acutely. Some 63% of adults with a bachelor's degree or higher level of education say they will need to keep advancing their skills throughout their career, compared with 45% of those with no college experience who feel the same sense of urgency. Government data reinforce this finding as workers with higher levels of education are more likely to engage in job training or acquire job certificates or licenses.

Adults with higher levels of education see a greater need for ongoing training

%, among those in the labor force, saying it will be essential for them to get training and develop new skills throughout their work life



Note: "Some college" includes those who have attended college, but have not earned a degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Young adults are more likely than their older counterparts to see skills and training as essential (61% among those ages 18 to 29), perhaps because of the longer trajectory they have ahead of them. Even so, 56% of those ages 30 to 49 say ongoing training will be essential for them, as do roughly four-in-ten workers ages 50 and older.

Adults who are working in certain STEM-related industries of science, technology, engineering and math are among the most likely to say ongoing training and skills development will be essential for them. Two-thirds of employed adults who work in computer programming and information technology say this will be essential for them. And roughly six-in-ten workers who are in the health care industry (62%) say the same. By contrast, about half of adults working in hospitality (47%), manufacturing or farming (46%) or retail or wholesale trade (46%) see training and skills development as an essential part of their future work life.[3]

For some people, acquiring new skills won't just be a necessity in the future: 35% of working adults say they need more education and training *now* in order to get ahead in their job or career. A plurality of those who say they need more training say the best way for them to get that training would be through additional formal education. This is true across levels of educational attainment: Four-year college graduates say they would pursue a graduate degree, two-year college graduates say they would try to get a four-year degree, and high school graduates say they would go to college.

[3] The industries and occupations mentioned are not exhaustive but represent some of the most common responses given in the survey. See Methodology for details on how industries and occupations were classified.

A significant share (about a third) of workers who say they need more training believe on-the-job training would be the best way to gain the skills they need to get ahead, while fewer (17%) point to certificate programs as the most promising pathway.

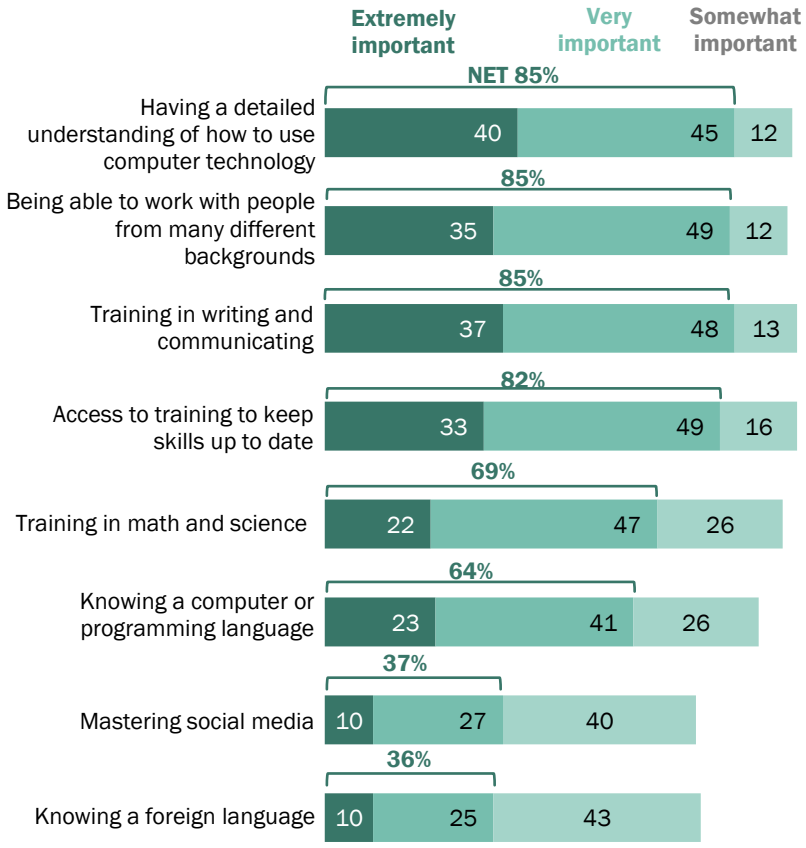
Public sees a mix of soft skills and technical skills as crucial to success in today's economy

When people think about what it takes for workers to be successful these days, large majorities rank a mixture of technical and "soft skills" as critical, including detailed understanding of how to use computers (85% say this is "extremely" or "very" important), ability to work with those from diverse backgrounds (85%), training in writing and communications (85%) and access to training to update skills (82%).

Next on the list are training in science and math – 69% believe that is extremely or very important – and knowing computer programming (64%). A smaller share of Americans believe that mastering social media (37%) and knowing a foreign language (36%) are at least very important for success in the modern workplace.

Americans believe knowledge of computers, social dexterity, communications skills and access to training are keys to success for today's workers

% saying these traits are important for workers to be successful in today's economy



Note: NETs calculated before rounding.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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When workers are asked about the skills they rely on most in their jobs, interpersonal skills, critical thinking, and good written and spoken communications skills top the list.[4] While most Americans say having a detailed understanding of computer technology is very important for success in today's economy, only 28% say computer skills are central to the work they do, and even fewer (14%) say they rely on high-level math, analytical or computer skills at work.

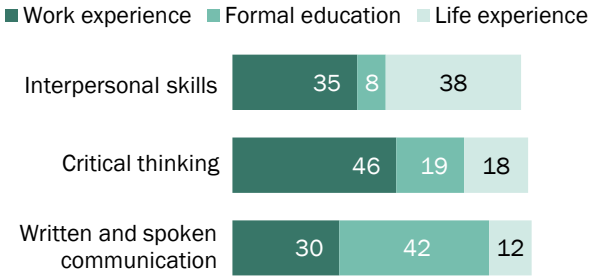
Workers who rely heavily on interpersonal skills, critical thinking and good communications skills report that they acquired these skills in different settings. Among workers who say that having interpersonal skills is extremely or very important for them to do their job, some 35% say they learned those skills on the job, while 8% say they honed those skills through their formal education. But a sizable share – 38% – volunteer that they taught themselves those skills or came by them naturally.[5]

For those who rely on critical thinking skills, the workplace is an important training ground. Among workers who say this skill set is important in their job, 46% say they learned these skills on the job. About one-in-five (19%) say they acquired these skills in their formal education, and a similar share (18%) say they gained these skills through life experience.

Workers are more divided when it comes to where they learned written and spoken communications skills: 42% say they picked up these skills through their formal education, while 30% say they learned these skills through work experience. An additional 12% say they learned these skills through life experience or that they were self-taught.

Workers acquire key job skills in a variety of settings

Among workers who said ____ is important for their job, % saying they learned this skill mainly through ...



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. For respondents who ranked more than one item as "extremely" or "very" important to their job, a random item was selected. "Life experience" is a volunteered response. "Specialized training," "Some other way" and volunteered responses of "Some combination" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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[4] Respondents who reported having more than one job but did not consider any to be their primary job were not asked this question, nor were they asked most subsequent questions about their current job. Those who said they have more than one job but consider one to be their primary job were asked to think about only their primary job when answering questions about their current job.
[5] Respondents were asked how they learned one skill that they listed as extremely or very important for their job. Respondents who ranked only one skill as "extremely important" were asked about that skill. If they ranked more than one skill extremely important, one of those skills was randomly chosen. Respondents who did not rank any skills extremely important but ranked one skill "very important" were asked about that skill. If they ranked no skills extremely important, but ranked more than one skill very important, one of those skills was randomly chosen.

Pay is almost stuck in place and benefits are less plentiful

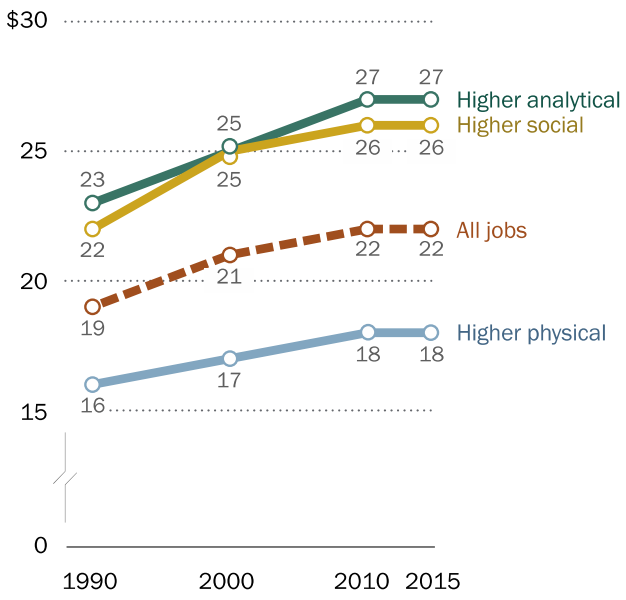
The earnings of American workers have increased modestly in recent decades. According to the Center's analysis of government data, the average hourly wage, adjusted for inflation, increased from $19 in 1990 to $22 in 2015, or 16% in 25 years.[6] Jobs requiring higher levels of social or analytical skills generally pay more than jobs requiring higher physical or manual skills, and the pay gap between manual and analytical jobs has grown over the years.

The average hourly wage of workers in jobs requiring higher levels of analytical skills increased from $23 in 1990 to $27 in 2015, or 19%. And the average wages of workers in jobs requiring higher levels of social skills increased from $22 to $26 over that time period (15%). In the meantime, the average hourly wage of workers in jobs in which physical skills are important increased only 7%, from $16 in 1990 to $18 in 2015.

The survey finds that pluralities of Americans feel that employer benefits are not as generous as they were in the past (49% say that) and that they will continue to worsen in the future (44%). They are right about the direction benefits have been going. According to government data, the share of workers with an employer-sponsored health insurance plan (either through their own employer or through the employer of a family member) fell from 77% in 1980 to 69% in 2013. In addition, the share of workers with access to an employer-sponsored retirement plan has fallen. It most recently peaked at 57% in 2001, up from 50% in 1980.[7] However, the share fell to 45% by 2015.

Wages are higher and increased more in occupations requiring relatively higher levels of social or analytic skills

Average hourly wage, in 2015 dollars



Note: Based on civilian wage and salary workers ages 16 and older. Self-employed workers are not included.
Source: Pew Research Center analysis of O*NET and Current Population Survey outgoing rotation files.
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[6] Percentage changes are computed before numbers are rounded.
[7] This increase occurred entirely in the 1990s, a decade that encompassed the longest economic expansion in modern U.S. history. The share covered by their own employer's health plan held fairly steady in the 1990s, in contrast to declines before and after the decade.

Currently, most Americans do not feel threatened in their jobs, but many say jobs feel less secure than in the past and competitive threats come from several directions

There are somewhat paradoxical findings in the survey when it comes to issues related to job security. On the one hand, American workers' confidence in their own job security is relatively high these days, especially compared with the low point in the early 1980s. On the other hand, people believe there is less job security overall now than in the past, and that more job insecurity awaits tomorrow's workers.

Today, 60% of employed Americans say it is not at all likely that they will lose their job or be laid off in the next 12 months. An additional 28% say it is not too likely. By comparison, in the midst of the 2001 recession, 52% believed it was not at all likely they would be laid off.

Overall, 49% of American workers say they are very satisfied with their current job. Three-in-ten are somewhat satisfied, and the remainder say they are somewhat dissatisfied (9%) or very dissatisfied (6%). The most satisfied workers tend to live in higher-income families and have higher levels of education.

Still, the survey identifies vulnerable workers. Those with lower levels of education are more likely to be temporary workers or out of work altogether. They are also more likely to believe their current skills are insufficient for career advancement and to think there are not enough good jobs locally. Furthermore, less educated workers are also among the most likely to say that their jobs are imperiled. For instance, 39% of those without a high school education say it is very or fairly likely they may be laid off within 12 months. By comparison, 7% of those with a bachelor's degree or more education say the same.

Educational attainment is a clear and consistent marker when it comes to feelings about job security and future prospects. One-in-five (20%) of those with a high school diploma or less believe it would be possible for their boss to use technology to replace them – nearly double the rate of those with a bachelor's degree who say that. Roughly four-in-ten (38%) workers with no college experience say they lack the education and training to get ahead in their jobs, compared with 27% of those with a bachelor's degree who assert that.

More broadly, and despite the views of many that their current jobs are safe, a sizable number view the national job situation as unstable at best. A majority of Americans (63%) believe jobs are less secure now than they were 20 to 30 years ago, and about half (51%) anticipate jobs will become less secure in the future.

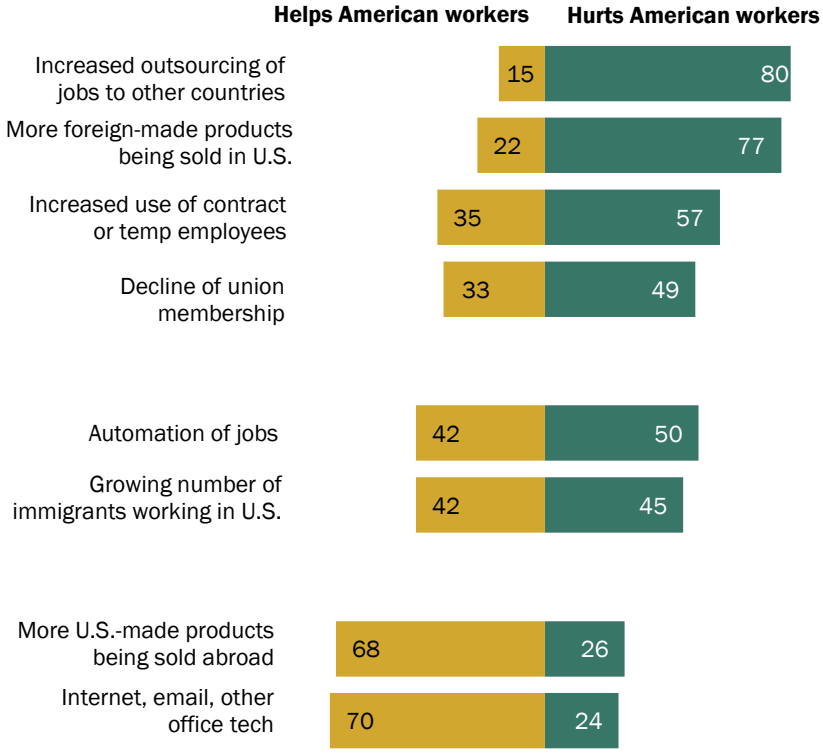
As they assess the factors that may be hurting U.S. workers, people say the greatest harms to American jobs are outsourcing (80% believe outsourcing hurts American workers) and imports (77%). Many also cite the increased use of contract and temporary workers (57%) and the decline of union membership (49%) as harmful factors.

The impact of immigrants and automation draw more evenly divided verdicts. Half of Americans (50%) think automation of jobs has hurt workers, compared with 42% who think it has helped.

Some 45% of Americans believe the growing number of immigrants working in the U.S. has hurt workers overall, and 42% believe the immigrant influx has helped workers. There has been a substantial increase since 2006 in the share of Americans, especially among Democrats, who believe the influx of immigrant workers has helped U.S. workers overall.

People believe outsourcing and imports are the biggest harms to U.S. workers; they are more divided about the impact of immigrants and automation

% of adults who think these factors help or hurt American workers



Source: Survey conducted May 25-June 29, 2016.
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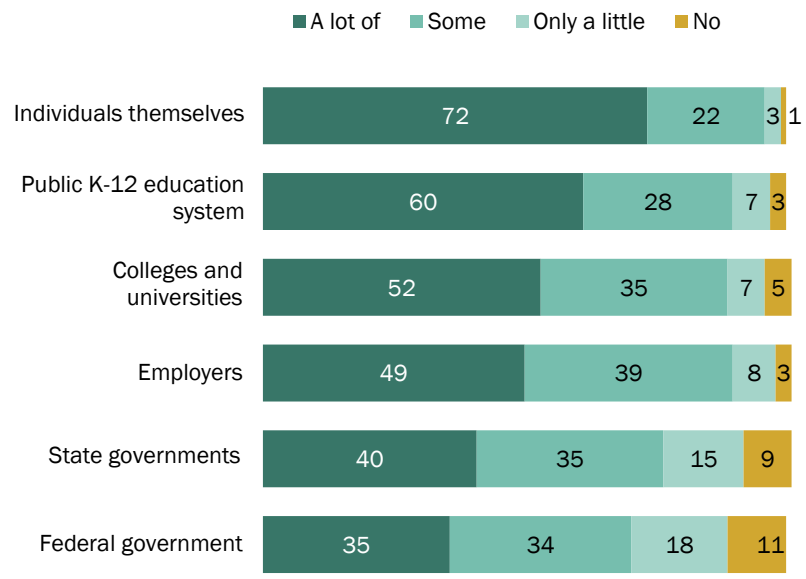
What's mostly helping workers? Big majorities think exports and work-enhancing technology such as the internet and email are aids to workers.

People say workers themselves have the most responsibility for their job readiness and K-12 schools are the next in line; opinions diverge about the role of colleges, employers and governments

Americans think the responsibility for preparing and succeeding in today's workforce starts with individuals themselves: 72% say "a lot" of responsibility should fall on individuals, and 22% say "some" responsibility is theirs. Six-in-ten believe public K-12 schools should have a lot of responsibility, while 28% believe schools should bear some responsibility.

Americans think individuals and public schools should have the most responsibility to make sure workers have the right skills

% saying these groups should have ____ responsibility in making sure that the American workforce has the right skills and education to be successful in today's economy



Note: "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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After that, views differ on the roles other entities should play, including some ambivalence about the purpose of colleges and universities. Among all adults, 52% say colleges should have a lot of responsibility in making sure that the American workforce has the right skills and education to be successful, and 49% believe employers should have a lot of responsibility. After that, 40% assign a lot of responsibility to state governments, and 35% say the federal government should assume a lot of responsibility.

Notably, people's views are linked to their partisan allegiances. Democrats and independents who lean Democratic are more likely than Republicans and Republican leaners to say public schools, colleges, and the federal and state governments should have a lot of responsibility for making sure

U.S. workers are prepared for today's jobs. Republicans and Republican leaners place more emphasis on individual responsibility.

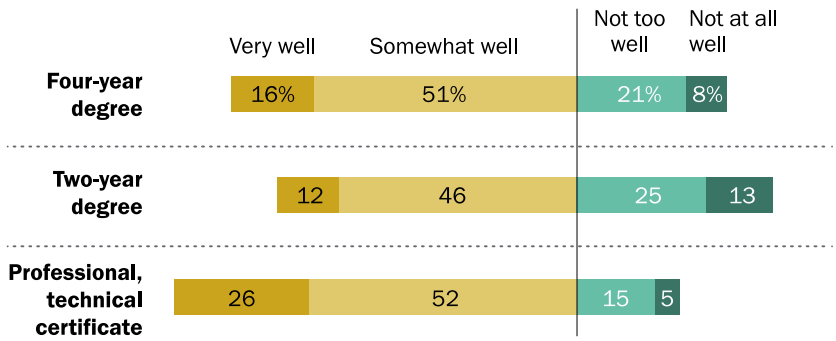
Even as college graduates salute their experiences as positive, many do not think colleges do a great job preparing students for the workplace

Americans have somewhat mixed attitudes about the effectiveness of traditional four-year colleges and other higher education institutions. On a personal level, many college graduates describe their own educational experience as having a generally positive impact on their personal and professional development. Around six-in-ten (62%) college graduates with a two-year or four-year degree think their degree was very useful for helping them grow personally and intellectually, while roughly half think it was very useful for opening up job opportunities (53%), or for providing them with specific job-related skills and knowledge (49%).

Yet even as many college graduates view their own educational experience in positive terms, the public as a whole – including a substantial share of college graduates – expresses reservations about the ability of higher education institutions to prepare students for the workforce more generally.

Americans have mixed views about how well post-high school education prepares students for the workforce

In general, how well do you think a _____ prepares someone for a well-paying job in today's economy?



Note: "Four-year degree," "Two-year degree" and "Professional, technical certificate" were asked of different samples. Volunteered responses of "Depends on the person/job" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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Just 16% of Americans think that a four-year degree prepares students very well for a well-paying job in today's economy. An additional 51% say colleges prepare students somewhat well for the workplace. The verdict on two-year colleges is similar: 12% think that a two-year associate degree prepares students very well, and 46% say this type of degree prepares students somewhat well. When it comes to professional or technical certificates, 26% of adults say these prepare students very well for well-paying jobs and 52% say somewhat well. These findings tie to previous Pew

Research work showing that noteworthy majorities of adults think colleges fail to provide students with good value for the money and that college is too expensive.

Relatively positive assessments of certificate programs as a way to prepare workers for jobs in today's economy are particularly widespread among those who did not complete high school; 44% in this group say these types of programs prepare people very well, compared with about a quarter (27%) of those with a high school diploma and a similar share of those with some college (22%), a two-year degree (28%), or a four-year degree or more (22%).

Workers have mixed views on the extent to which their own credentials and qualifications match up with the requirements of their job. Some 41% say they have more qualifications than their job requires, compared with 50% who think they have the right amount of qualifications and 9% who say they are underqualified.

In addition, working Americans were asked if they thought someone with less education than they had could develop the skills and knowledge needed to do their job. A solid majority (73%) say "yes." Among those with a bachelor's degree, 65% say someone with less education could learn to do their job, and the shares are significantly higher among those with some college (82%) and those with a high school diploma (80%). Even so, job seekers take minimum requirements seriously. A third of those who do not have a four-year college degree have elected not to apply for a job they felt they were qualified for because it required a four-year degree, suggesting that employers may be missing out on a pool of potential workers.

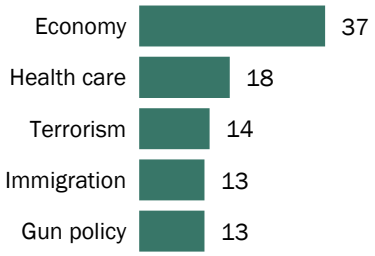
The economy is at the top of voters' minds

These findings about the state of work in America emerge in the midst of a national political campaign where voters think the economy is a top concern. A separate Pew Research Center survey, conducted Sept. 1 to 4, 2016, among 1,004 adults nationwide, focused on major issues in the campaign. Offered a list of five key issues and asked which one is the most important to their vote for president, 37% of registered voters cite the economy, 18% choose health care, 14% say terrorism, 13% name immigration and 13% name gun policy.

Asked further about a series of economic concerns, 43% of voters say the job situation is either the most important

Economy tops other key issues in importance for presidential vote

% of registered voters saying ____ is the most important issue in their vote for president



Source: Survey of U.S. adults conducted Sept. 1-4, 2016.
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economic issue in determining their vote for president this year or the second most important. The same share say the federal budget deficit is either first or second among the factors driving their vote for president. An additional 38% of voters point to tax reform as the most or second-most important economic issue influencing their vote for president, 32% cite income inequality, 22% say rising prices and 16% cite global trade.

Among registered voters, Republicans (43%) and Democrats (48%) are roughly equally likely to cite jobs as the first or second key economic issue driving their vote for president. They differ, however, in the importance of the budget deficit – Republicans are three times as likely as Democrats to rank this as a top issue (62% vs. 20%). Among independents, 50% place high importance on the deficit. Republican voters also place more importance on tax reform than do Democrats (44% vs. 31% say it's the most or second-most important issue).

Democratic voters place much more importance on income inequality than do Republicans: 54% vs. 12%, respectively, rank this issue as the most or second-most important economic issue for them. Democrats are also more likely than Republicans to say rising prices are an important voting issue (26% vs. 16%). There is no significant gap between Democrats and Republicans when it comes to the importance of global trade.

The remainder of this report examines in greater detail key trends in the labor market and how they are playing out in the lives of American workers. Chapter 1 includes an analysis of trends in job and wage growth by occupations with an emphasis on skills and preparation. It also looks at trends in employer-provided benefits, job tenure, hiring practices and alternative work arrangements. Chapter 2 looks at public assessments of the job situation – including how key characteristics of work have changed from a generation ago and what the future may look like, the extent to which megatrends in the economy are helping or hurting today's workers, who bears the greatest responsibility for worker readiness these days, and which skills are most important in today's economy. Chapter 3 explores the views of workers themselves including job satisfaction and fulfillment and feelings about job security. Chapter 4 looks at the skills workers use in their own jobs, whether they feel properly equipped to do their jobs well, and where they would turn to increase their skills and gain additional training. And finally, Chapter 5 explores public views about the value of a college education.

Other key findings:

- In 2015, one-in-four workers (25%) in the U.S. had a job-related certificate or license, such as an information technology certificate or a teacher's license, according to new data from the U.S. Bureau of Labor Statistics. The share is higher among better educated workers,

running at 52% among workers with a postgraduate degree. Women (28%) are more likely than men (23%) to have a certificate or license.

- Young workers are earning significantly less than they did in 1980, but the opposite is happening with older workers. Among full-time, year-round workers, the median earnings of 16- to 24-year-olds in 1980 were $28,131. By 2015 the median had fallen 11%, to only $25,000. Meanwhile, the median pay of workers 65 and older rose 37%, from $36,483 in 1980 to $50,000 in 2015. And workers ages 55 to 64 also earned 10% more in 2015 than they did in 1980. (Earnings data are in 2014 dollars.)

- Americans are putting in more time at work. The average length of a workweek was 38.7 hours in 2015, slightly up from 38.1 hours in 1980.[8] Meanwhile, Americans are working more weeks per year. The average weeks worked per year increased from 43 in 1980 to 46.8 in 2015. Combined, this adds up to an additional one month's worth of work in a year.

- Job tenure has ticked upwards. In 2014, about half of workers (51%) had worked for their current employer five years or more, compared with 46% of workers who were in that position in 1996.

- Workers are increasingly taking on a variety of nontraditional jobs: Some work as independent contractors, some are employed through a contract firm and others are on-call workers or serve as temporary help through an agency. According to experts,[9] the share of U.S. workers with these alternative employment arrangements has gone up significantly in this century. It's estimated that in 2015, 15.8% of the U.S. workforce, or 24 million workers, is in these types of jobs.

[8] The trend in hours worked depends on the data source (Frazis and Stewart, 2010). The figures presented are based on the Current Population Survey and use household respondent reports of work hours.
[9] All references for alternative work arrangements are from Katz, Lawrence F. and Alan B. Krueger, "The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015" Published September, 2016, NBER.

1. Changes in the American workplace

A shifting economic landscape is driving significant changes in the American workplace. Employment opportunities increasingly lie in jobs requiring higher-level social or analytical skills, or both. Physical or manual skills, as much in demand as social or analytical skills some three decades ago, are fading in importance. Not coincidentally, employment is rising faster in jobs calling for greater preparation, whether through education, experience or other forms of training.

These changes have played out surely and steadily in recent decades. A key factor is the decline in manufacturing employment, by about a third just since 1990. Meanwhile, employment in knowledge-intensive and service-oriented sectors, such as education, health, and professional and business services, has about doubled. Underlying factors such as globalization, outsourcing of jobs and technological change are among the key forces contributing to the transformation.

Americans are taking note of these trends. Respondents to the accompanying Pew Research Center survey report that interpersonal skills, critical thinking, and good writing and communications skills are the most important skills for doing their jobs. And the share of adults ages 25 and older with a bachelor's degree or higher level of education increased from 17% in 1980 to 33% in 2015. Most of these workers are engaged in jobs requiring higher-level social or analytical skills.

The changes at the workplace have benefited some workers more than others. The earnings of workers in jobs requiring higher levels of social and analytical skills have risen proportionately more than the earnings of those in jobs requiring higher levels of physical skills. The growing inequity in earnings by skill type is also reflected in the rising inequality in earnings between workers with or without a college education.

The shifting need for skills may have worked to the benefit of women, since they are more likely than men to be employed in occupations needing higher levels of social and analytical skills, whereas men are relatively more engaged in jobs calling for greater physical and manual skills. Because wages have risen faster in jobs requiring higher levels of social and analytical skills, this is likely to have contributed to the shrinking of the gender pay gap from 1980 to 2015.

Determining job skills and preparation

This report analyzes the changing demand for three core families of job skills – social, analytical and physical. Generally speaking, social skills encompass interpersonal skills, written and spoken communications skills, and management or leadership skills. Analytical skills refer to computer and mathematical skills and the importance of critical thinking. Physical skills pertain to the ability to work with machinery or equipment, manipulate tools, and do physical or manual labor.

The source data for the analysis is the Department of Labor's Occupational Information Network (O*NET), a database covering more than 950 occupations. For each occupation, O*NET contains ratings of detailed skills on a scale measuring their importance to job performance, from one (not important) to five (extremely important). From the scores of skills listed in O*NET, ratings for a representative handful of skills were selected to represent the broader families of social, analytical and physical skills. For example, negotiating and instructing skills are among those chosen to represent social skills. The O*NET ratings for these and related skills are averaged to estimate an overall social skill rating for an occupation. A similar process is repeated to determine the analytical and physical skill rating for a job. Examples of skills chosen to represent analytical abilities are critical thinking and judgment/decision making. Physical abilities are rated based on such skills as handling and moving objects and equipment maintenance.

Ratings for individual occupations are further averaged to obtain an overall rating of the importance of each skill in the American workplace. For example, the average rating of social skills in 2015 was estimated to be 2.96, "important" on the O*NET scale. Thus, occupations with a social skill rating of 2.96 or higher, corresponding to "important," "very important" or "extremely important," are classified as requiring higher levels of social skills. Examples of such occupations are chief executives and registered nurses. A similar process is used to separate jobs requiring average or above-average analytical skills (e.g., tax preparers) or physical skills (e.g., welding, soldering and brazing workers) from other jobs. (See a table available for download online for a complete list of occupations and their skill ratings.)

It is important to note that a single job may require high levels of more than one skill. For example, most managers and teachers are typically expected to possess higher levels of both social and analytical skills. Among the 430 occupations analyzed in detail, 206 require average or above-average levels of social skills. Moreover, 180 of these 206 occupations also require a higher level of analytical skills. Thus, there is considerable overlap in the counts of workers in jobs requiring higher levels of social or analytical skills. The overlap is limited between jobs requiring higher levels of physical skills and those requiring higher levels of social or analytical skills.

The preparation required for the performance of a job is also rated on a scale of one to five in O*NET, from little or no preparation needed to extensive preparation needed. The level of preparation depends on a combination of education, experience and other forms of training. The mid-level preparation (rating of three) corresponds to an associate degree or a similar level of vocational training, plus some prior job experience and one to two years of either formal or informal on-the-job training (e.g., electricians). Above-average preparation typically calls for a four-year college degree and additional years of experience and training (e.g., lawyers).

In the midst of a changing workplace, the implicit contract between workers and employers appears to be loosening. The earnings of workers overall have lagged behind gains in labor productivity since the 1970s.[10] Moreover, smaller shares of workers receive health or pension benefits in 2015 than they did in 1980. More recently, alternative employment arrangements, such as contract work, on-call work and temporary help agencies, appear to be on the rise.

This chapter focuses on how work has changed for American workers in recent decades. The key issue is the shift in employment opportunities, from jobs requiring physical or manual skills to those requiring social or analytical skills. Related to this is the need for higher levels of education, experience and job training. At the same time, workers must adapt to changes in the broader economic climate. Thus, this section also reports on other key trends in the labor market relating to employment and earnings opportunities, provision of benefits, hours worked, job tenure and work arrangements.

The importance of a given skill to a job is ascertained from the latest ratings in the Department of Labor's Occupational Information Network (O*NET), a comprehensive database whose ratings are based on surveys of workers combined with information received from job analysts. The ratings information from O*NET is matched to occupations listed in the Current Population Survey (CPS), a monthly survey of approximately 55,000 households conducted jointly by the U.S. Census Bureau and the Bureau of Labor Statistics. The CPS data are then used for the analysis of employment and wage trends in occupations grouped by skill types (see the text box and Methodology for details). The CPS is also the source of the data for most of the remaining analysis.

The changing demand for job skills and preparation

The types of skills needed in the workplace and the level of preparation required to fulfill a job may change over time for two reasons. One possibility is that occupations themselves transform in some fashion, perhaps calling for more computer skills and training over time or using technology to substitute for manual demands. Another possibility is that employment may shift across occupations in response to larger economic and demographic changes. For example, globalization has led to a reduction in the need for manufacturing workers in the U.S., but the aging of the population has increased the need for doctors and nurses.

This chapter focuses on the changing need for job skills and preparation driven by the shift in employment across occupations from 1980 to 2015. Occupations are sorted by importance of a skill type and the level of preparation using the most updated skill ratings in O*NET, principally from within the past decade. These ratings do not change over time. However, employment

[10] See a recent note posted by Erica L. Groshen, commissioner, Bureau of Labor Statistics.

changes over time and across occupations, driving the overall change in skills and job preparation in the workplace.

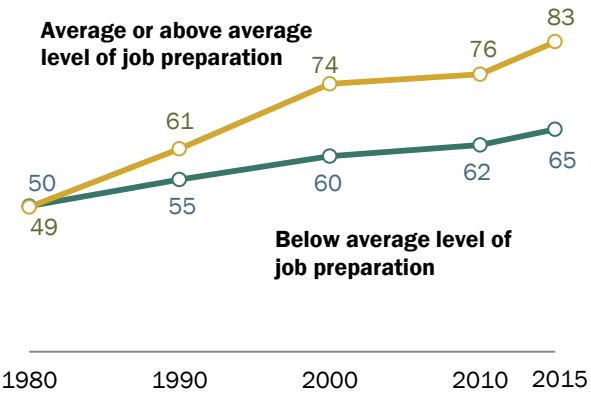
The need for job preparation

More workers today are in jobs where a higher level of preparation is needed. The number of workers in occupations requiring average to above-average education, training and experience increased from 49 million in 1980 to 83 million in 2015, or by 68%. This was more than double the 31% increase in employment, from 50 to 65 million, in jobs requiring below-average education, training and experience.

As a result, roughly equally divided in 1980, the clear majority of workers in today's workforce are in jobs calling for significant preparation. At a minimum, these jobs require an associate degree or a similar level of vocational training, plus some prior job experience and one to two years of either formal or informal on-the-job training. (Examples of these occupations range from electricians to lawyers. See the text box for details.)

Employment is rising faster in occupations requiring higher levels of preparation

Number employed, in millions



Note: Based on employed civilians ages 16 and older. The job preparation level is based on a scale of one (little or no education/ experience/training) to five (extensive education /experience/ training).
Source: Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS).
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Within the group of occupations requiring an average to above-average level of preparation, the fastest growth in employment is in jobs that typically require at least a four-year college degree and considerable to extensive training and experience. Employment in these high-skill occupations, including accountants, teachers, surgeons and the like, increased from 22 million in 1980 to 39 million in 2015, or by 80%.

The growing demand for higher-skilled jobs is associated with the overall improvement of the education level of the U.S. population. The share of adults 25 and older with a bachelor's degree or higher level of education has nearly doubled in the past 35 years, from 17% in 1980 to 33% in 2015.

The rise of social and analytical skills in the labor market

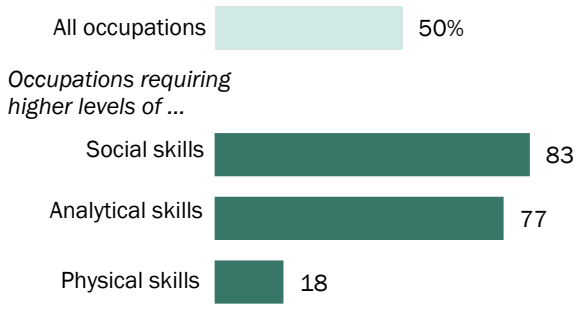
In addition to the level of preparation needed for jobs, the types of skills called for at work are changing. Employment in occupations needing higher levels of social or analytical skills increased significantly from 1980 to 2015, but the demand for higher levels of physical skills has increased only slightly.

Employment in jobs requiring average or above-average levels of social skills, such as interpersonal, communications or management skills, increased 83% from 1980 to 2015. Meanwhile, employment in jobs requiring higher levels of analytical skills, such as critical thinking and computer use, increased 77%. Examples of jobs needing higher-level social or analytical skills include chief executives, civil engineers, postsecondary teachers and nurses.

In sharp contrast, employment in jobs requiring higher levels of physical skills, machinery operation or tool manipulation, barely budged, increasing only 18%. Jobs calling for higher levels of physical skills include carpenters, welders, and the like. By comparison, overall employment in the economy increased 50% from 1980 to 2015.

Employment growth is more rapid in occupations requiring higher social or analytical skills

% change in employment, 1980-2015



Note: Based on employed civilians ages 16 and older. Occupations requiring a higher level of a skill set are those with average to above-average ratings in the importance of the skill set to job performance. Because an individual occupation may require higher levels of more than one skill, the three categories of occupations are not mutually exclusive.
Source: Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS).
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In terms of numbers, 90 million workers of a total of 148 million were engaged in jobs requiring higher levels of social skills in 2015. At the same time, 86 million workers were in jobs needing average to above-average analytical skills in 2015. Employment in jobs requiring higher levels of physical skills added up to 57 million.

As noted in more detail in the accompanying text box, there is an overlap in these counts of workers because many jobs call for higher levels of more than one type of skill. For example, managerial or teaching jobs require higher levels of both social and analytical skills. This group of jobs – needing higher levels of both of these skills – is boosting employment by the most in the

labor market. More specifically, employment in this select group of jobs increased from 39 million in 1980 to 76 million in 2015, an increase of 94%.

While there is considerable overlap between social and analytical skills, the need for physical skills in combination with social or analytical skills is limited. Most jobs that require higher levels of physical skills, such as carpenters; laundry and dry-cleaning workers; and welding, soldering and brazing workers, do not call for higher levels of social and analytical skills. In 2015, there were 38 million workers employed in jobs requiring only higher levels of physical skills. This number was up only 12% from 1980, when it stood at 34 million.

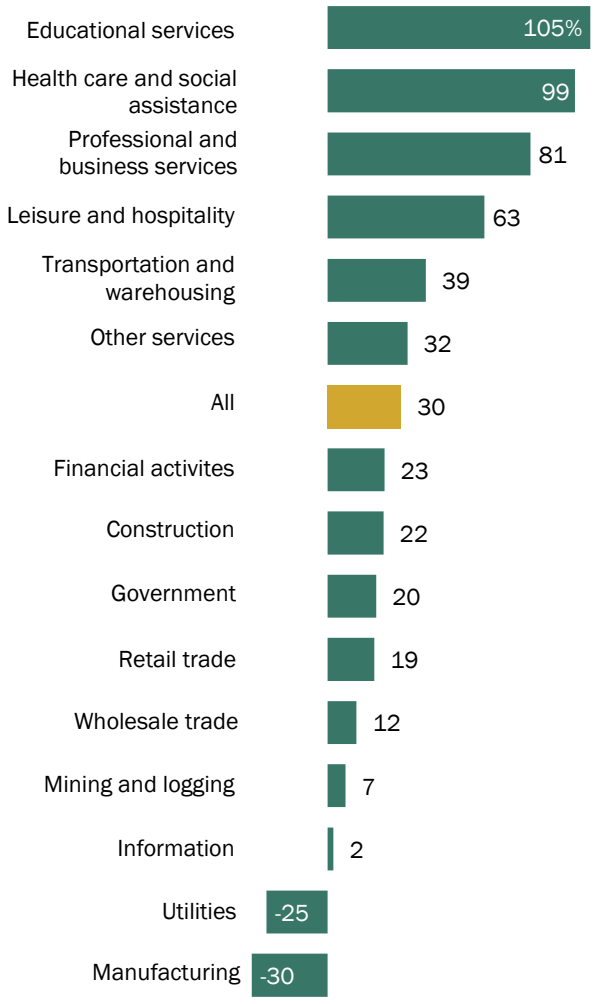
Employment in jobs requiring higher levels of social or analytical skills is concentrated in more rapidly growing sectors of the economy

Although each sector in the economy creates a diverse array of jobs, some occupations are more likely than others to be found in certain sectors. For example, doctors and nurses are principally in the health care and social assistance sector, while teachers are concentrated in the educational services sector. Similarly, many production workers, such as machinists or tool and die makers, are in manufacturing. For this reason, changes in the economic fortunes of individual sectors are likely to have an influence on the changing needs for skills in the labor market.

In the past quarter century, there was a sharp divergence in employment growth across

Employment growth is strongest in education and health services, but manufacturing is shedding workers

% change in industry employment, 1990-2015



Note: "All" does not include farm employment.
Source: Pew Research Center analysis of U.S. Bureau of Labor Statistics Current Employment Statistics survey.
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industries. From 1990 to 2015, employment doubled in educational services and in health care and social assistance, increasing 105% and 99%, respectively. Employment growth was almost as strong in professional and business services (81%).

Overall, these three rapidly growing sectors combined to hire 20 million more workers from 1990 to 2015, more than half of the total increase of 32 million. More importantly, in 2015, 45% of workers in jobs where social skills are in use at a higher level were employed in these three sectors, as were 44% of workers in occupations requiring higher analytical skills. Thus, the growing importance of social or analytical skills may be linked to the expansion in education, health, and professional and business services.

At the same time, the diminishing importance of physical skills in the economy is partly tied to the

Fast-growing industries are more likely to employ people in occupations requiring higher levels of skills

% distribution of employment, by industry, 2015

Industry	Overall employment distribution	Distribution of employment in occupations requiring higher levels of a given skill		
		Social skills	Analytical skills	Physical skills
Educational services	9%	13%	13%	3%
Health care and social assistance	14	19	16	13
Professional and business services	12	13	15	9
Leisure and hospitality	9	5	4	11
Transportation and warehousing	4	2	2	9
Other services	5	4	4	5
Financial activities	7	9	11	1
Construction	7	3	4	13
Government	5	6	6	4
Retail trade	11	11	8	8
Wholesale trade	3	3	3	2
Mining and logging	1	1	1	1
Information	2	2	3	1
Utilities	1	1	1	1
Manufacturing	10	7	8	16
Total	100	100	100	100

Note: Industries are listed in order of percentage growth in employment from 1990 to 2015. Employment growth was highest in educational services (105%), health care and social assistance (99%) and professional and business services (81%). Employment fell in utilities (-25%) and manufacturing (-30%).
Source: Pew Research Center analysis of O*NET data and Current Population Survey outgoing rotation files.
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decline of employment in manufacturing. In 2015, 16% of workers in jobs calling for higher levels of physical skills were in the manufacturing sector, compared with 10% of workers overall. But the manufacturing sector shed nearly one-third of its workforce from 1990 to 2015. Meanwhile, jobs requiring higher levels of physical skills are underrepresented in educational services, health care and social assistance, and professional and business services.[11]

Wages are increasing faster in jobs that require higher levels of social or analytical skills and higher levels of preparation

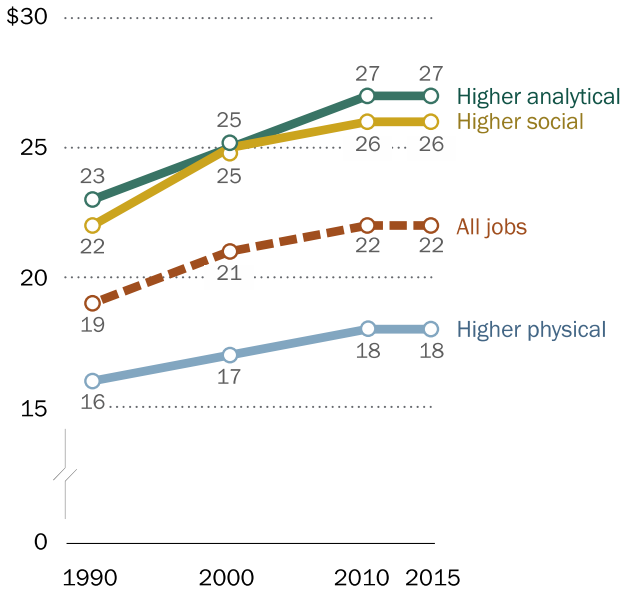
Jobs requiring higher levels of social or analytical skills generally pay more than jobs requiring higher physical skills. From 1990 to 2015, the average earnings in jobs more reliant on social or analytical skills have also increased more than the average earnings in jobs requiring more intensive physical skills. As a result, the earnings gap between jobs requiring higher levels of social or analytical skills on the one hand and physical skills on the other has widened over this period.

In 1990, the average hourly wage of workers in jobs requiring higher analytical skills was $23. This was followed closely by workers in social skill-intensive jobs, who earned $22 per hour. Lagging well behind were workers in physically intensive jobs, who earned $16 per hour, 72% as much as workers in higher analytical skill jobs. (All wages expressed in 2015 dollars.)

From 1990 to 2015, the average hourly wage in jobs requiring higher analytical skills increased the most, rising 19% to $27.[12] The average hourly wage in higher social skill jobs increased 15%, to $26. However, wages for workers in higher physical skill jobs were nearly

Wages are higher and increased more in occupations requiring relatively higher levels of social or analytic skills

Average hourly wage, in 2015 dollars



Note: Based on civilian wage and salary workers ages 16 and older. Self-employed workers are not included.
Source: Pew Research Center analysis of O*NET and Current Population Survey outgoing rotation files.
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[11] Some 25% of workers in occupations requiring higher levels of physical skills are employed in educational services, health care and social assistance, and professional and business services, compared with 35% of workers overall.
[12] Percentage changes are computed before numbers are rounded.

stagnant, increasing only 7% to $18 per hour. Consequently, workers in physically intensive jobs earned only 65% as much as workers in higher analytical skill jobs in 2015.

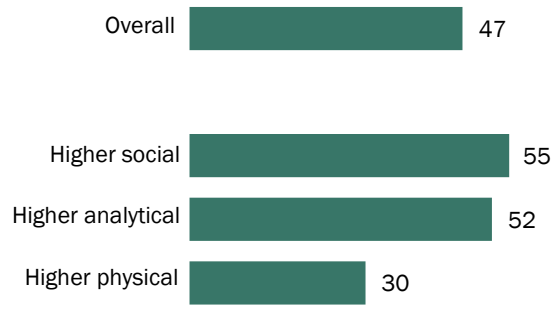
Women may have benefited more than men from the changing demand for skills

Women are more likely than men to be employed in occupations where social or analytical skills are relatively more important. In light of the wage trends described above, this may have helped narrow the gender wage gap in recent decades.

Overall, women made up 47% of the workforce in 2015. But they were the majority of workers in occupations requiring average or above-average levels of social skills (55%) and workers in jobs requiring higher analytical skills (52%). By contrast, women's employment share in occupations requiring higher levels of physical skills was significantly lower (30%).

Women make up the majority of workers in occupations requiring higher social or analytical skills

% of workers who are women, 2015



Note: Based on employed civilians ages 16 and older. Occupations requiring a higher level of a skill set are those with average to above-average ratings in the importance of the skill set to job performance. Because an individual occupation may require higher levels of more than one skill, the three categories of occupations are not mutually exclusive.
Source: Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS).
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Because of the relatively higher wage associated with jobs requiring higher social or analytical skills, women's overrepresentation in these jobs may have helped narrow the gender wage gap. As shown in a later section in this report, the median annual earnings of full-time, year-round working women increased from $30,402 in 1980 to $40,000 in 2015, a gain of 32%. However, full-time, year-round working men experienced a 3% loss in earnings as their median annual earnings fell from $51,684 in 1980 to $50,000 in 2015. As a result, the wage gap between women and men narrowed from about 60 cents on the dollar in 1980 to 80 cents on the dollar in 2015. (Annual earnings expressed in 2014 dollars.)

A higher level of education is related to the use of social and analytical skills and other forms of job preparation

There is a strong link between workers' level of education and the odds of their working in jobs that require higher levels of social or analytical skills. Moreover, workers with higher levels of education are more likely to acquire other types of job trainings, acquiring certificates or licenses along the way.

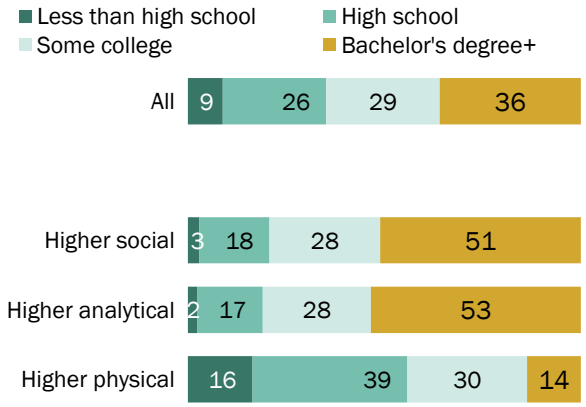
In 2015, among employed workers overall, more than one-third (36%) had completed at least a four-year college degree program. But college-educated workers accounted for about half of employment in occupations requiring higher social skills (51%) or higher analytical skills (53%). Meanwhile, only 14% of workers in jobs requiring higher physical skills were college educated. The education level of a majority of workers in physical-skill jobs was high school or less.

The relationship between college education and skills suggests that the need for college-educated workers may continue to grow in the future. At the same time, new government data reveal that workers with higher levels of education also have higher levels of job preparation in the form of job-related certificates or licenses.

In 2015, one-in-four workers (25%) in the U.S. had a job-related certificate or license, according to new data from the Bureau of Labor Statistics (BLS). The share was highest among the most educated. More than half (52%) of workers with a postgraduate degree had a job certificate or license.[13] Similarly,

Half of workers in occupations requiring higher social or analytical skills are college educated

% of employed civilians ages 16 and older, 2015



Note: Occupations requiring a higher level of a skill set are those with average to above-average ratings in the importance of the skill set to job performance. Because an individual occupation may require higher levels of more than one skill, the three categories of occupations are not mutually exclusive. "Some college" includes those with a two-year associate degree.
Source: Pew Research Center analysis of O*NET and monthly Current Population Survey data (IPUMS).
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[13] Certificates and licenses are both job-related, but they are not the same. Certificates are often issued by nongovernment organizations (e.g., an information technology certificate), but licenses are issued by government agencies and convey a legal authority to work in an occupation (e.g., cosmetology, teaching, medical practice). Only job-performance related certificates/licenses are included in the estimates. So commercial driver's licenses are included, but regular driver's licenses are not. General purpose certificates (e.g., educational certificates from community colleges) are excluded.

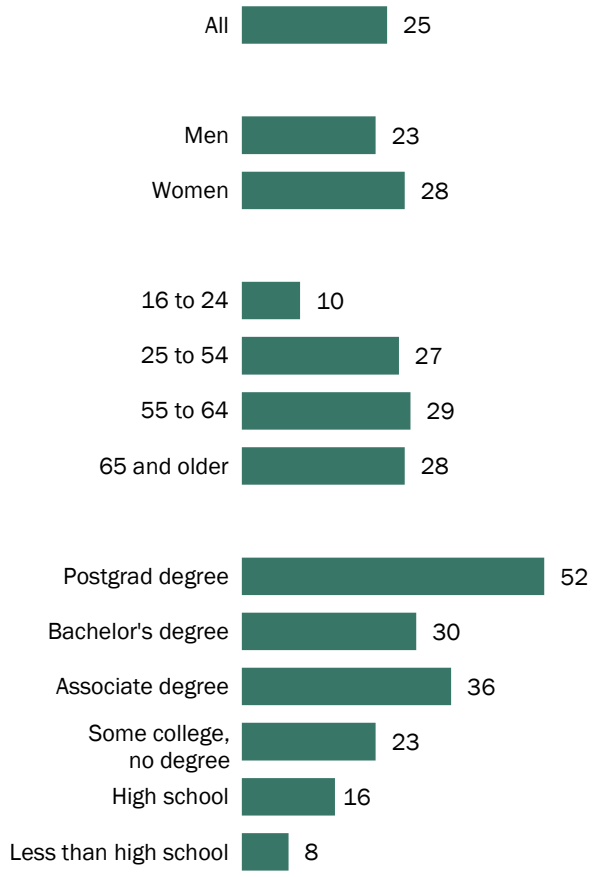
workers with a bachelor's degree alone (30%) and workers with an associate degree (36%) were more likely than average to have a job-related certificate or license.

There is also a gender gap in the acquisition of certificates and licenses, but in favor of women. In 2015, women (28%) were more likely than men (23%) to have certificates or licenses. However, there is virtually no difference by age in the likelihood of having a job certificate or license among workers 25 and older.

The relationship among education, gender and job training may be the result of which industries and occupations require certificates and licenses. Indeed, industries and occupations vary greatly on this account. Nearly half the workers (47%) in education and health services have a certificate or license. But only about 10% of workers in retail trade, information, and leisure and hospitality have a certificate or license. By occupation, certification or license rates are highest in health care occupations (77%), legal occupations (68%) and education occupations (56%).

Workers with higher levels of education are more likely to have a job-related certificate or license

% of employed civilians ages 16 and older with a job-related certificate or license, 2015



Note: Shares by the level of education are based on employed civilians ages 25 and older.
Source: U.S. Bureau of Labor Statistics. "The State of American Jobs"

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More educated workers and women fared better than others, but employment and earnings prospects overall are little improved

Acquiring new skills and seeking higher levels of job preparation are not the only challenges facing workers today. Two recessions this century, in 2001 and the Great Recession of 2007-09, have set back the employment and earnings potential of many workers by years. Meanwhile, employers have also cut back on the provision of health and pension benefits. Traditional employment arrangements, while still the norm, are showing signs of waning. Alternative work arrangements in the form of contract work, on-call work and temporary help agencies appear to be on the rise. But in the midst of this, women have raised their engagement with the labor market and the gender wage gap has narrowed in recent decades.

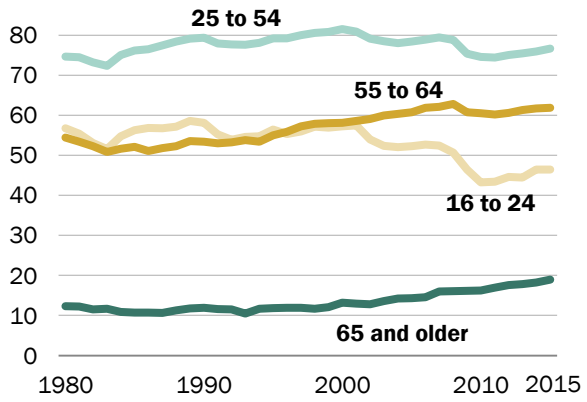
Trends in employment

The employment rate in the U.S. – the share of the population 16 and older that is employed – has been relatively steady since 1980. It peaked most recently at 64% in 2000 but returned to its 1980 level (59%) by 2015. The decline in the employment rate since 2000 is linked in part to the aging of the workforce as older workers are less likely to remain in the labor force. Another important factor is the Great Recession (2007-09), which resulted in a sharp contraction in the employment rate, from 63% in 2007 to 58% in 2011.

Even though the overall employment rate is currently the same as in 1980, there are some sharp differences across age groups. Younger workers are much less likely to be working today than they were in 1980, and older workers are laboring on more. Most of this turnaround has happened this century.

A rising share of the population ages 55 and older is working

% of civilian population that is employed, by age



Source: Pew Research Center analysis of Current Population Survey Annual Social and Economic Supplements (IPUMS).
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Among 16- to 24-year-olds, less than half (46%) were employed in 2015, compared with 57% in 2000. This trend is driven partly by the fact that a larger share of young adults are enrolled in college, which delays their entry into the workforce. Among 18- to 24-year-olds, 40% were enrolled in college in 2014, compared with 26% in 1980.

At the other end of the age spectrum, older adults are staying in the workforce longer than they used to and their employment rate is climbing as a result. The share of adults 65 and older who are employed has risen steadily in recent decades, climbing from 12% in 1980 to 19% in 2015. The increase was uninterrupted by the Great Recession. The employment rate for adults ages 55 to 64 has also risen since 1980, but its level in 2015 (62%) was less than its peak in 2008 (63%).[14]

Women, too, have greatly increased their presence in the workforce in the past several decades. Some 48% of women 16 and older were employed in 1980, and this share increased to 58% by 2000. During the same period, the employment rate for men held steady at about 70%. Since 2000, the employment rate has fallen for both men and women, although men have experienced a slightly steeper decline. For men, the employment rate fell from 71% in 2000 to 65% in 2015, or 6 percentage points. During the same period, the employment rate for women decreased from 58% to 54%, a drop of 4 percentage points.

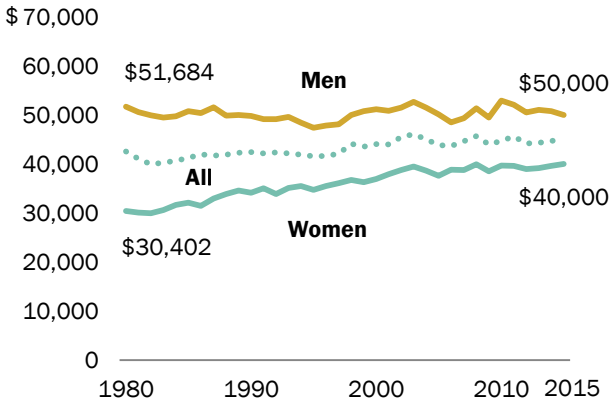
Earnings of full-time, year-round workers are fairly flat since 1980[15]

American workers overall have not received much of a pay raise from 1980 to 2015. But there is a sharp difference in the outcomes for men and women during this time – the earnings of men have fallen, and the earnings of women have risen. Workers with a four-year college degree and older workers have also fared better than others.

After adjusting for inflation, the median earnings for all full-time, year-round workers increased only 6% from 1980 to 2015, from $42,563 to $45,000 (in 2014 dollars).[16] Women, however, experienced a 32% gain in median earnings from 1980 to 2015. In sharp contrast, men experienced a 3% loss in

The typical earnings of employed women have increased

Median annual earnings of full-time, year-round workers, in 2014 dollars



Note: Based on civilians ages 16 and older with positive earnings who worked 35 hours per week or more and at least 50 weeks last year. Respondents were asked to report earnings from the previous calendar year.
Source: Pew Research Center analysis of Current Population Survey Annual Social and Economic Supplements (IPUMS).
"The State of American Jobs"

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[14] For an earlier Pew Research Center report on recession and the changing American workforce, see "Recession Turns a Graying Office Grayer."
[15] Respondents were asked to report earnings during the calendar year prior to the survey year. All earnings data in this section are expressed in 2014 dollars.
[16] "Full-time, year-round" workers refer to those who worked 35 hours per week or more and at least 50 weeks in the past year. The median divides workers into two groups, with half earning more than the median and half earning less.

earnings. As a result, the wage gap between women and men has narrowed from about 60 cents on the dollar in 1980 to 80 cents on the dollar in 2015.

Along education lines, workers with a four-year college or higher level of education are the only group to experience a gain in median earnings since 1980. The median earning of a college-educated worker increased 11% from 1980 to 2015 ($57,764 to $64,000). Meanwhile, the median earnings of workers with lesser education decreased, with the greatest loss experienced by workers who did not complete high school. The median for these workers fell from $33,442 in 1980 to $25,000 in 2015, a loss of 25%.

Younger workers are earning significantly less than they did in 1980, but the earnings of older workers have risen. Among full-time, year-round workers, the median earnings of 16- to 24-year-olds decreased from $28,131 in 1980 to $25,000 in 2015, a drop of 11%. Meanwhile, the median earnings of workers 65 and older rose 37%, from $36,483 in 1980 to $50,000 in 2015. Workers ages 55 to 64 earned 10% more in 2015 than they did in 1980. The median earnings of workers ages 25 to 54 have remained flat at around $45,000. Full-time, year-round workers ages 65 and older used to earn less than their prime-age peers (ages 25 to 54), but now their earnings match those of workers ages 55 to 64 and they are among the ranks of the nation's highest paid workers.

A smaller share of workers are covered by employer-provided benefits[17]

As earnings overall barely inched up, employee benefits – judged by the share of workers covered by employer-sponsored health insurance or retirement plans – have eroded since 1980. Only older workers, 55 and older, and, to some extent, workers with a four-year college degree or higher level of education have bucked this trend. But even as the coverage of workers has slipped, benefit costs have assumed a larger share of employee compensation due, in part, to the rising cost of health insurance plans.

Health insurance benefits

As of 2013, employer-sponsored health insurance plans cover a smaller share of workers than they did in 1980. Most workers get health insurance coverage either through their own employer or the employer of a family member, such as a spouse or parent. The share of workers with any employer-sponsored health insurance plan (either through their own employers or through the employer of a family member) fell from 77% in 1980 to 69% in 2013. The share of workers covered by a health insurance plan through their own employer dropped from 62% in 1980 to 51% in 2013.

[17] Respondents were asked to report coverage during the calendar year prior to the survey year. Estimates of health insurance coverage for 2014 and 2015 are not shown because they are not yet available in the source data (CPS-IPUMS). Also, there were major changes in the CPS questionnaire on health insurance coverage in 2014.

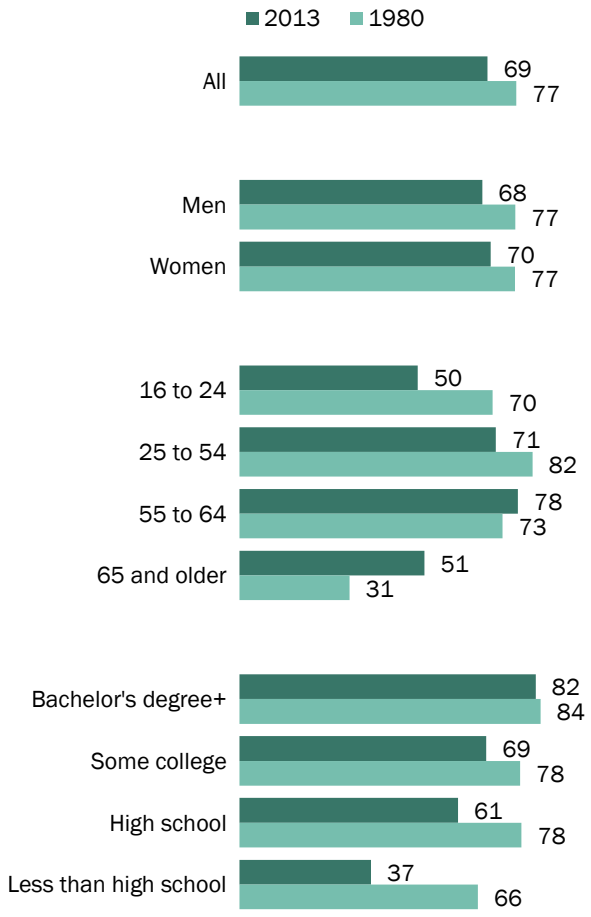
Among demographic groups, participation in an employer-sponsored health plan diminished similarly among men and women, from 77% for both in 1980 to 68% for men in 2013 and 70% for women.

The youngest workers (ages 16 to 24) experienced the sharpest decline in employer-sponsored health insurance coverage. Seven-in-ten young workers in 1980 had health insurance either though their own employer or through the employer of a family member, but only half of today's young workers do. The coverage for workers ages 25 to 54 dropped from 82% to 71%. However, older workers, especially those ages 65 and older, are much more likely to get insurance through an employer than they were several decades ago. The share of workers ages 65 and older with employer-sponsored health insurance increased from 31% to 51%.

Across education groups, workers with a bachelor's degree or higher level of education are the only group that did not experience much of a decline in health insurance coverage received through employers. Coverage fell among all other education groups. The sharpest drop was among workers with less than a high school education, as the share of these workers with an employer-sponsored health plan fell from 66% in 1980 to 37% in 2013.

Participation in employer-sponsored health insurance plans fell most among young adults and the lesser educated

% of employed civilians ages 16 and older who participated in an employer-sponsored health insurance plan



Note: Figures represent health insurance coverage either through own employer or through the employer of a family member. Respondents were asked to report participation during the previous calendar year. "Some college" includes those with a two-year associate degree.
Source: Pew Research Center analysis of Current Population Survey Annual Social and Economic Supplements (IPUMS).
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Retirement benefits

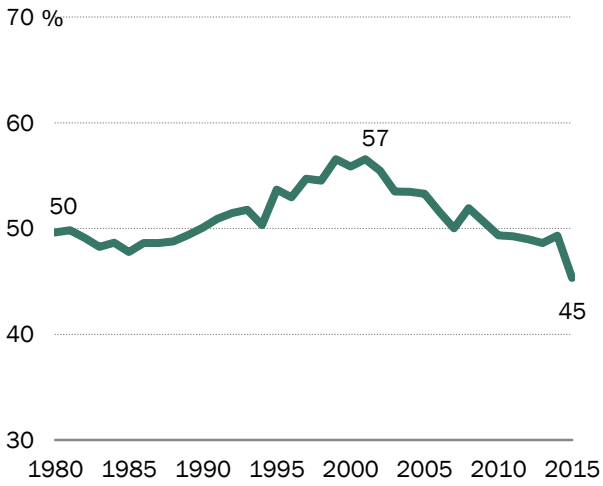
In contrast to the long-run decline in health insurance benefits, the decrease in retirement benefits is of more recent origin. The share of workers with access to an employer-sponsored retirement plan, whether a traditional pension or a 401(k)-type plan, peaked most recently at 57% in 2001, up from 50% in 1980.[18] However, the share fell to 45% by 2015.

Changes in retirement plan access also vary across demographic groups, with older workers and women faring better than other groups. In 1980, only 25% of workers 65 and older had access to an employer-sponsored retirement plan, but the share increased to 40% in 2015. Overall, retirement benefits are most commonly available to workers in their prime working years. In 2015, the share of workers in a retirement plan or with access to one ranged from 51% among 55- to 64-year-olds to 30% among 16- to 24-year-olds.

The share of employed men with access to a retirement plan decreased from 53% in 1980 to 44% in 2015. At the same time, the share among employed women edged up from 45% to 46%. Thus, women now are more likely than men to have access to a retirement plan.[19]

Share of workers who participate in a retirement plan or have access to one has fallen since 2000

% of civilians ages 16 and older with a job in the preceding year, who had access to an employer-provided retirement plan



Note: Respondents were asked to report access during the previous calendar year. Data labels shown are for 1980, 2001 and 2015.
Source: Pew Research Center analysis of Current Population Survey Annual Social and Economic Supplements (IPUMS).
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Although a smaller share of workers today are covered in employer-sponsored health or retirement plans, the employers' cost of providing these benefits has risen over time. This is reflected in the share of benefits in a worker's total compensation. The average hourly compensation of employees in June 2016 was $34.05, according to the U.S. Bureau of Labor Statistics. Of this, $23.35, or 69%, went to wages and $10.70, or 31%, went to benefits. A quarter

[18] This increase occurred entirely in the 1990s, a decade that encompassed the longest economic expansion in modern U.S. history. The share covered by their own employer's health plan started to fall in the 1980s, held fairly steady in the 1990s, and then continued to decrease in this century.
[19] This gap turned in favor of women in 2001.

century earlier, in 1991, 72% of compensation went to wages and 28% to benefits. The increase in benefit costs derives principally from an increase in insurance benefits (including health insurance). The insurance share in employee compensation is up from 7% in 1991 to 9% in 2016. There is also an increase in the share of retirement benefits, from 4% to 5%.

Workers today stay longer with their employer

Job tenure, measured by how long workers have been with their current employer, has increased in the past three decades. Most of this increase occurred since 2000. In part, this is due to the rising share of older workers in the labor force. These workers tend to have a much longer tenure with their employer. But the economic downturns this century, such as the Great Recession, may also have been a factor, making it harder for workers to switch jobs.

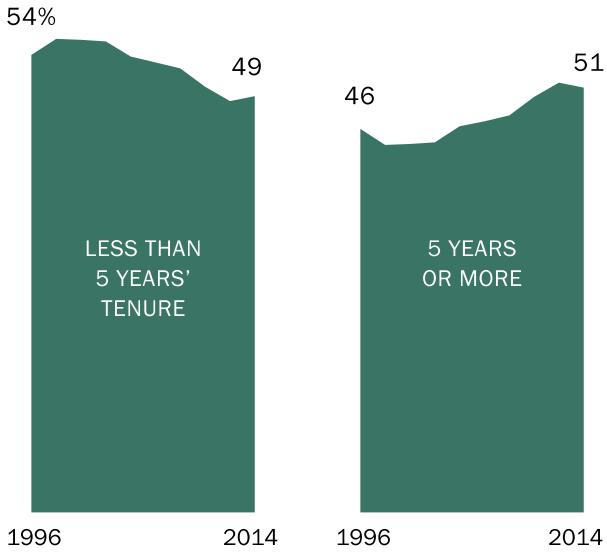
The median job tenure for all workers was 4.6 years in 2014, up from 3.5 years in 1983. The increase was greater among women (from 3.1 years in 1983 to 4.5 years in 2014) than among men (from 4.1 years to 4.7 years over the same period). Thus, working women now stay with their employer almost as long as their male counterparts do.

Looked at another way, about half of workers (51%) had worked for their current employer five years or longer in 2014, compared with 46% of workers in 1996. Meanwhile, the share of workers who stay with their current employer for one year or less dropped from 26% to 21%.

Older workers tend to have been with their current employer longer than younger workers. In 2012, workers 55 and older had a median tenure greater than 10 years, compared with about 3 years for 25 to 34-year-old workers. The job tenure of specific age groups has not changed much since 1996, with the exception of older workers. The share of workers 65 and older who were with the same

The share of workers with at least 5 years on the job has risen since 1996

% of wage and salary workers ages 16 and older



Note: The self-employed are not included.
Source: Pew Research Center analysis of Current Population Survey Displaced Worker Supplements (IPUMS).
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employer for five years or more went up from 67% in 1996 to 76% in 2014, and the share among workers ages 55 to 64 increased from 71% to 75%.

Workers with higher education do not have more job tenure than their lesser-educated counterparts. Among workers 25 and older, those with at least a bachelor's degree had a median job tenure of 5.6 years in 2014, compared with 5.8 years for those with only a high school diploma. Workers with less than a high school education have the shortest tenure among all education groups (4.4 years in 2014), and their median tenure has been flat since 1996.

Americans are working more overall[20]

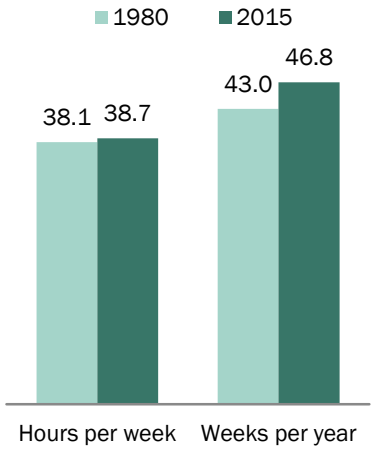
Americans may not be employed in greater shares and their earnings may have risen only modestly, but they are putting in more time at work today than they did in 1980. Most notably, workers are putting in an average of nearly four more weeks of work annually, with the average climbing from 43 weeks in 1980 to 46.8 weeks in 2015 (weeks at work include paid vacation and sick leave). The average length of a typical workweek is also up, increasing to 38.7 hours in 2015 from 38.1 hours in 1980.[21] Overall, this adds up to an additional one month's worth of work.

This change is largely driven by the increasing hours and weeks that women devote to the labor market. With respect to hours at work, the average amount of time per week by employed women increased from 34.1 hours in 1980 to 36.2 hours in 2015, while the average for men was unchanged at about 41 hours.

Employed women also significantly increased the weeks they worked on a yearly basis. The average number of weeks worked by working women was 46.2 in 2015, compared with 40.2 in 1980. Weeks worked increased by less among employed men, rising from 45.2 in 1980 to 47.4 in 2015. As a result, employed women now work nearly as many weeks annually on average as men.

People are working more weeks and hours

Average usual hours worked per week and the number of weeks worked, in previous calendar year



Note: Based on civilians ages 16 and older who worked last year. Paid vacation and sick leave are counted as weeks worked.
Source: Pew Research Center analysis of Current Population Survey Annual Social and Economic Supplements (IPUMS).
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[20] Respondents were asked to report hours and weeks worked during the calendar year prior to the survey year.
[21] The trend in hours worked depends on the data source, according to Frazis and Stewart, 2010. The figures presented are based on the Current Population Survey and use household respondent reports of work hours.

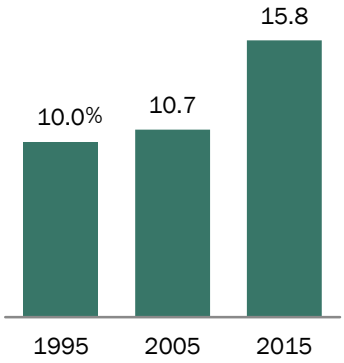
Another factor contributing to the growing trend is the sharp increase of work hours among workers 65 and older. The average for workers in this age group increased from 29.3 hours per week in 1980 to 33.7 in 2015. Over the same period, workers 65 and older also raised the annual number of weeks worked from 38.3 to 44.6.

Alternative employment arrangements may be on the rise, but fewer workers are self-employed or working multiple jobs

The emergence of services sourced through Uber, Mechanical Turk, Airbnb and other online platforms has given rise to debates about whether the workers providing those services are employees or contractors and whether they receive the basic workplace protections and benefits as under conventional work arrangements. Similar concerns surround companies' use of contract or temporary workers in lieu of adding workers directly to their payrolls. Although there is evidence that alternative work arrangements are becoming more prevalent, principally driven by the rise of contract work and independent contractors, the emergence of a sizable online economy where many workers rely on employment and compensation from "gigs" seems to be some distance away.

More workers are in alternative employment arrangements

% of workers who have alternative work arrangements



Note: Alternative work arrangements include independent contractors, on-call workers, temp agency workers, and workers provided by contract firms.
Source: Katz and Krueger (2016). "The State of American Jobs"

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"Alternative employment arrangements" refers to the hiring of workers who are independent contractors or sourced through contract firms, on-call workers, or temporary-help agency workers. The Bureau of Labor Statistics first estimated the share of these workers in overall employment in 1995. At that time 10.0% of employed workers were in alternative employment arrangements. This share held steady in the following decade, edging up to 10.7% in 2005. More recently, independent researchers who replicated the government's survey found that the share of workers in alternative work arrangements had risen to 15.8% in 2015. Thus, about 24 million workers currently work in these arrangements.

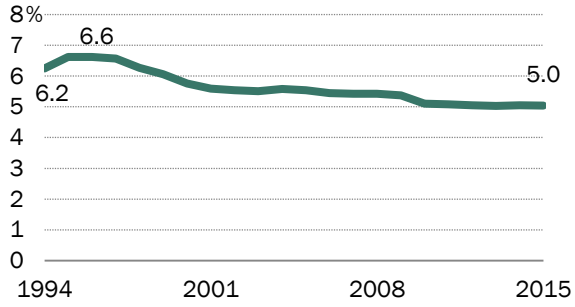
The majority of workers with alternative employment arrangements are independent contractors, and their share of the workforce rose from 6.3% in 1995 to 8.4% in 2015. The share of contract

workers – those hired by a contract company and sent to the customer's worksite – jumped from 1.3% in 1995 to 3.1% in 2015. They are now the second-largest group of workers with alternative work arrangements.

The online, or gig, economy appears still to be in its infancy, at least as measured by its engagement of workers. According to Katz and Krueger (2016), only 0.5% of all workers provided services through online intermediaries such as Uber in 2015. Another estimate from JPMorgan Chase Institute finds that 1% of adults earned income from work provided through online platforms in any given month from 2012 to 2015.

A smaller share of workers moonlight

% of employed civilians ages 16 and older who hold more than one job



Note: Data labels for 1994, 1996 and 2015 are shown.
Source: Pew Research Center analysis of monthly Current Population Survey data (IPUMS).
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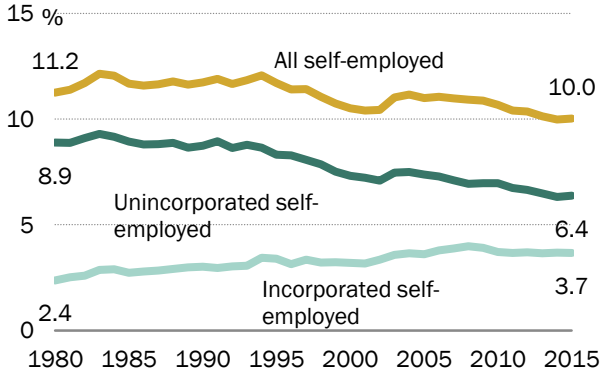
The emergence of the gig worker also fails to materialize in other labor market indicators. The share of workers who moonlight by working more than one job is on the way down, falling from more than 6% in the mid-1990s to 5% in 2015. Almost all of this decrease had transpired by 2000, perhaps driven by the economic boom in the 1990s, which may have reduced the need to moonlight. But the rate has shown no signs of inching up in recent years.

An increase in self-employment is another potential indicator of engagement in the gig economy. But the self-employment rate is also on the decline, falling from 11.2% in 1980 to 10.0% in 2015. The decrease is entirely due to the falling share of self-employed workers who have not incorporated their businesses, those more likely to be out on their own. [22]

The self-employment rate is falling

% of employed workers who are self-employed



Note: Self-employed people work for profit or fees in their own business, which may or may not be incorporated.
Source: Pew Research Center analysis of Current Population Survey outgoing rotation files.
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[22] The trend in self-employment depends on the data source. Internal Revenue Service data on tax returns for income related to self-employment activities suggest a rising trend for self-employed individuals, according to Katz and Krueger, 2016.

2. How Americans assess the job situation today and prospects for the future

People think that jobs in this country are being reshaped. They see many forces at play: the nature of employment itself is changing; benefits and compensation are being restructured; competition is coming from multiple directions, including outsourcing, imports, and the infusion of technology in workplaces; demands are growing for higher levels of performance and retooled worker competencies, including soft skills like social intelligence; and there is no clear consensus on which entities should be responsible for helping workers meet these challenges. Americans see increased emphasis on workers to continually improve their skills to keep up with job-related developments. Fully 71% believe demands to improve work skills will increase in the years to come.

At the same time, things do not feel relentlessly pressured. People also see a generational march that feels more positive than negative. More than half (56%) believe their standard of living is better than their parents' standard of living when their parents were their age. And more think their children's standard of living will be better than their own (46% believe this) than think things will get worse for their kids (24% think that).

As they assess jobs in the knowledge economy, large majorities say workers need a mix of technical skills (understanding computers is a must), comfort with diversity, and writing and communications training to succeed. Fully 72% of Americans subscribe to the bootstrap notion that individuals themselves have "a lot" of responsibility in getting the skills and education necessary to succeed in the modern workforce. Still, partisan political differences emerge as people try to apportion responsibility for who else or what else should assume the burden of worker preparation. Democrats are more likely than Republicans to say public schools, colleges, and the federal and state governments have a lot of responsibility for making sure U.S. workers are prepared for today's jobs.

This chapter examines people's answers about what they consider to be the present state of jobs in America, how the nature of work is changing, what skills people think are necessary for modern workplaces, and where responsibility lies when it comes to providing workers with the skills and education they need to succeed.

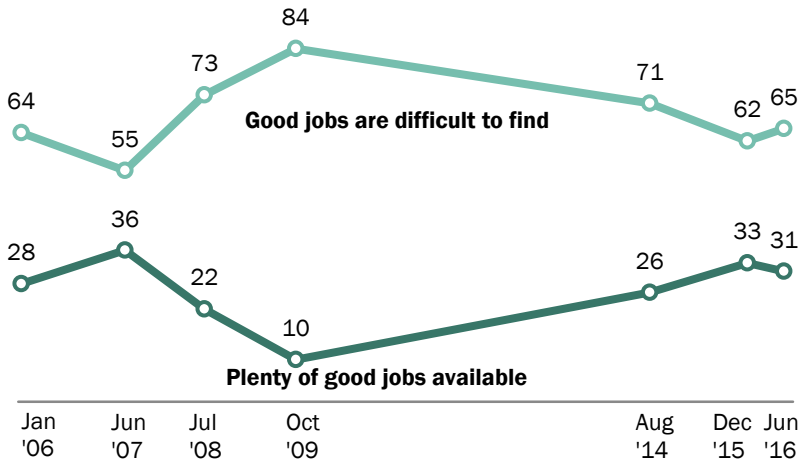
A majority of Americans do not think good jobs are available in their communities, but views of the situation have improved since the height of the Great Recession

By a two-to-one ratio, people think *good jobs* are difficult to find where they live. Some 65% of adults say this, compared with 31% who believe there are plenty of good jobs where they live. When the issue is simply the availability of jobs – whether good jobs or not – views remain negative, on balance: 56% of Americans assert that jobs are hard to find in their communities, while 37% say plenty of jobs are available.

A broad pattern of pessimism pervades people's views when they think about the prospects of good jobs in their areas. Even those with full-time jobs, those who live in high-income households and have high levels of education, those in every job sector, those in small companies and those in larger corporations, hourly workers and salaried workers, and those in every region of the country and every type of community are more downcast than upbeat about the availability of good jobs. Still, things were considerably worse in a 2009 survey by Pew Research, when 84% of Americans reported good jobs were hard to find and only 10% said plenty of good jobs were available.

More than six-in-ten Americans say good jobs are hard to find where they live

% saying ___ where they live



Note: Volunteered responses of "Lots of some jobs, few of others" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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While at least half of adults across all of these groups think good jobs are hard to find where they live, some groups are particularly pessimistic. For example, 72% of those with annual family incomes of less than $30,000 say good jobs are hard to find, compared with 56% of those with

incomes of $75,000 or more. And about three-quarters (76%) of adults living in rural communities say good jobs are hard to come by where they live, compared with 62% of those living in urban or suburban communities. Younger adults ages 18 to 29 are more bullish about jobs than their older counterparts – 40% say plenty of good jobs are available locally, compared with 30% or less among older age groups.

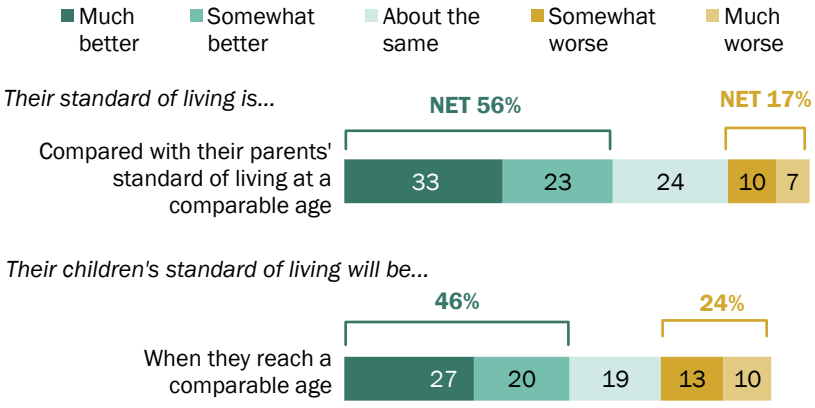
Most think they have it as good as or better than their parents had it, and most think their children will reach or exceed their own standard of living

Over the years, Americans' views about their standard of living have held relatively steady and have registered relatively optimistic when they compare their lives to their parents' lives and when they ponder the circumstances they believe their children's generation will face.

In this survey, 56% of adults say their standard of living is "much better" (33%) or "somewhat better" (23%) than their parents enjoyed at the same age. Some 24% report their standard of living is about the same as their parents. And 17% describe it as "somewhat worse" (10%) or "much worse" (7%) than their parents at a similar age. These are not very different readings from previous survey findings during strong economic times in the mid-2000s and during tougher circumstances when the effects of the Great Recession were still being felt in 2010.

Americans are more upbeat than downcast about how their standard of living has evolved – and will continue onward

% saying ...



Note: Figures may not add to 100% or sum to net due to rounding. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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Looking ahead, people are a bit less sanguine about their children's prospects, but they are more upbeat than despairing. Some 46% believe their children will enjoy a "much better" (27%) or "somewhat better" (20%) standard of living when they are their parents' age. Roughly a fifth (19%)

believe their kids will enjoy about the same standard of living, while only 13% believe it will be "somewhat worse" and 10% believe it will be "much worse" for their children when they are the same age their parents are today. Again, these views have not varied to any great degree in Pew Research Center surveys since the Great Recession began in 2007.

To some extent, people's current job satisfaction is tied to their views about how things have changed from their parents' circumstances to now. Among employed adults who are very satisfied with their job, 64% say their standard of living is better than their parents' was; among those who are somewhat satisfied, 55% say things are better for them than they were for their parents; among those who are somewhat or very dissatisfied, 39% say they are better off than their parents were.

Feelings about mobility linked to job satisfaction

% saying …

	Satisfaction with current job		
	Very satisfied	Somewhat satisfied	Somewhat/ Very dis-satisfied
Compared with parents at the same age, standard of living is …			
Better	64	55	39
Same	23	23	24
Worse	11	21	37

Note: Respondents were asked to compare their current standard of living with their parents when they were a similar age. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Yet, people's satisfaction with their jobs does not necessarily translate into hopes for their children's standard of living. As people think about where their children will be, those who are very satisfied with their current job are no more likely to be hopeful for their kids' lives than those who are very dissatisfied with their jobs.

In the past generation, people think work life has become less rewarding and more demanding

Despite their relatively upbeat assessments about their standard of living and prospects for the future, many Americans think jobs in the U.S. are less secure, more pressured, less rewarding in terms of benefits, and less built on worker loyalty to employers than in the past.

Two-thirds of all adults (66%) believe today's workers have to improve their work skills more often than workers of the previous generation did in order to keep up with developments tied to jobs. Some 63% say there is less job security for workers now than there was 20 to 30 years ago. About half (49%) think employee benefits such as health insurance, paid vacation and retirement plans are not as good as before. This compares with 25% who say benefits are better now and 23% who say they are about the same.

When it comes to employee loyalty to employers, 56% of adults believe today's workers show less loyalty to their employer, while 15% say there is more loyalty from workers now and 27% rank the loyalty level about the same as a generation ago.

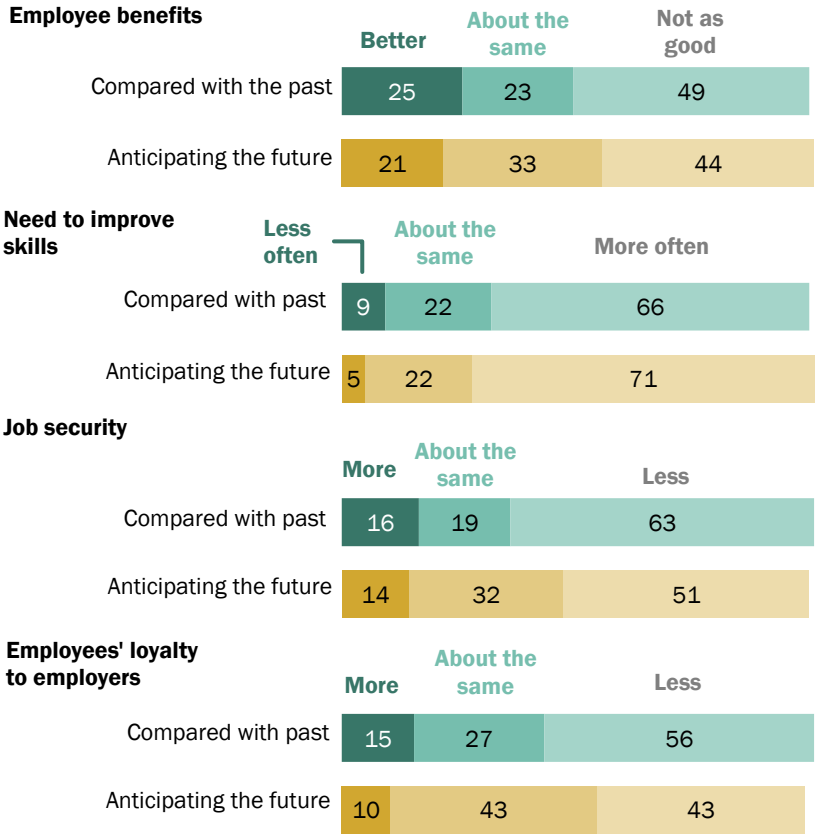
A 2006 Pew Research Center survey found a similar level of angst about workplace trends and conditions. About six-in-ten (64%) said the average working person had less job security in 2006 than 20 to 30 years earlier, and 70% said workers were required to update their skills more often than in the past to keep up with changes in the workplace. Roughly half (51%) said workers showed less loyalty to their employer than they had in the past.

As they look at the future, large numbers of Americans think things will intensify in the coming 20 to 30 years. Roughly seven-in-ten (71%) believe that workers will have to improve their skills more often in the future in order to keep up with job-related developments. About half (51%) think there will be less job security in 20 to 30 years, while only 14% predict more job security for workers, and 32% say this will stay about the same.

A plurality (44%) believe employee benefits will not be

Many think job conditions have become more challenging than a generation ago and that more stressful change is coming

% saying each aspect of work is ____ compared with 20 to 30 years ago and will be ____ 20 to 30 years from now



Note: Questions about the past and the future were asked of different samples. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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as good in the future, while 33% think benefits will be about the same and 21% believe they will be better.

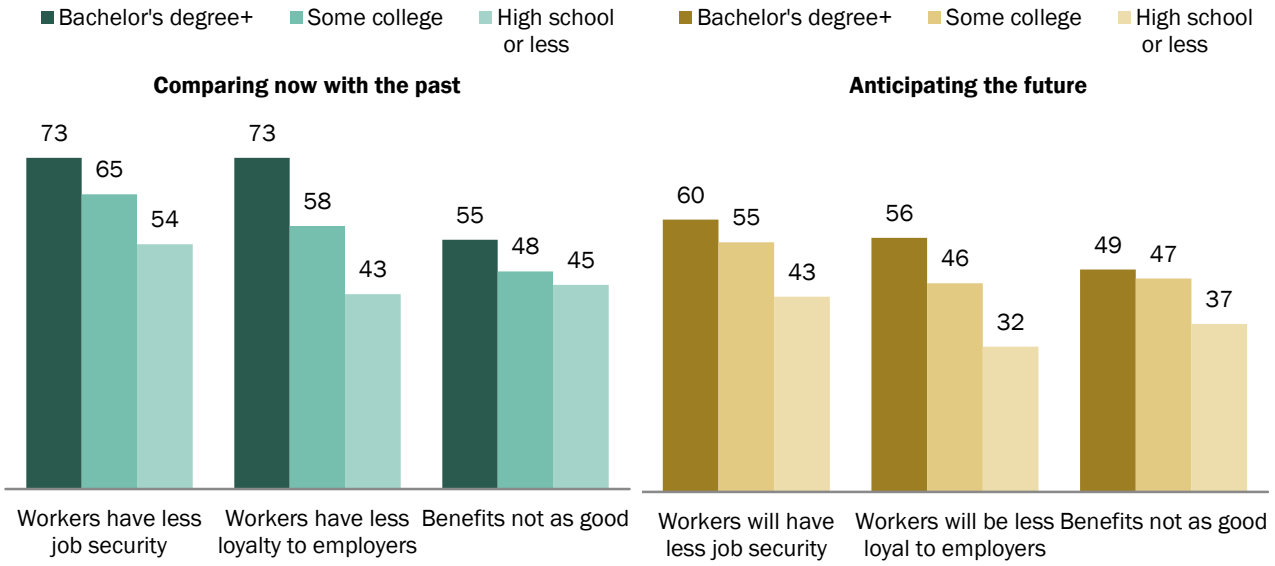
When it comes to worker loyalty, 43% say employees will show less loyalty to their employers in the future, while an identical share believe the current levels of loyalty will prevail. Only 10% believe that workers will have more loyalty to their firms 20 to 30 years from now.

There are clear socioeconomic class differences as people look at the changing nature of jobs

There are clear patterns by income and education in views about the present and future of work. Those in households with higher income and people with higher levels of education tend to be more discouraged about workplace trends than those with lower incomes and lower levels of education. For example, 73% of those with college degrees or more believe that there is less job security now for workers than there was 20 to 30 years ago, compared with 65% of those with

College-educated Americans are more likely to think job stresses have grown since a generation ago and to anticipate more strains in the future

% saying they see negative changes in jobs from a generation ago and believe they are coming in the generation ahead



Note: Questions about the past and the future were asked of different samples. “Some college” includes those with a two-year associate degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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some college education and 54% of those with a high school diploma or less. Moreover, 75% of those in households earning $75,000 or more say job security has worsened in the past generation, while 63% of those in households earning $30,000 to $74,999 and 53% of those in households earning under $30,000 agree.

Interestingly, those who have management jobs and those who are members of unions are equally likely to believe that job security has worsened in the past generation: 73% of adults in those job categories say job security has worsened. The same dynamic holds when it comes to employee benefits: 63% of both managers and union members say employee benefits are not as good now as 20 to 30 years ago. Some 57% of union members and 68% of managers believe employee loyalty to employers has lessened in the past generation.

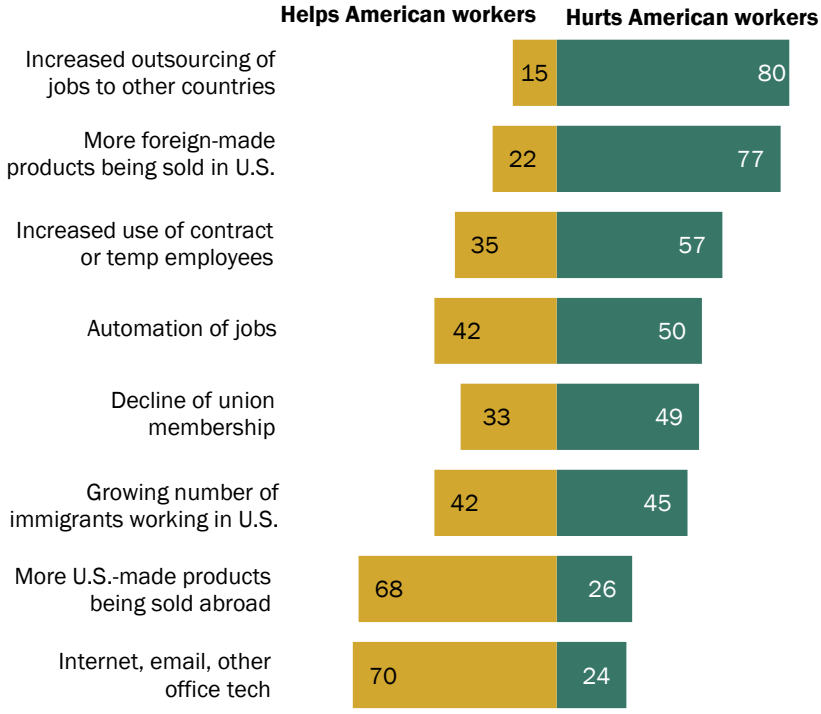
On the issue of how things will look in the next 20 to 30 years, the other noteworthy pattern relates to age. Americans ages 50 and older are more likely than those who are younger to think that worker benefits will not be as good for those working 20 to 30 years from now (50% vs. 39%) and that there will be less job security in the future (54% vs. 49%).

People think the greatest harms to U.S. workers are outsourcing and imports, but they are less worried about immigrants' impact on jobs than they were a decade ago

The survey measured public reactions to several key economic and workplace

People believe outsourcing and imports are the biggest harms to U.S. workers; they are more divided about the impact of immigrants and automation

% of adults who think these factors help or hurt American workers



Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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trends. The public ranks outsourcing of jobs and a rise in imports as the biggest threats to American workers. Fully 80% think outsourcing has done more to hurt than help workers, and 77% believe imports have taken their toll. At the other end of the spectrum, 70% of Americans say the internet, email and other office technology have helped workers and 68% think exports have helped.

The increased use of contract or temporary employees is viewed as a net-negative by the public: 57% say this trend hurts American workers, while 35% say it helps. Half of adults say automation has hurt U.S. workers vs. 42% who see it as a helpful trend, and 49% say the decline in union membership has hurt workers, while 33% say it has helped.

There is a divided verdict when it comes to Americans' assessment of the impact of immigrants: 45% of adults now believe that the growing number of immigrants working in the U.S. hurts workers and 42% say having more immigrants helps workers. This is a noteworthy change from Pew Research Center findings from 2006, when there was a nearly two-to-one view in the public that the growing number of immigrants hurt U.S. workers. Some 55% of Americans said a decade ago that immigration hurt workers, compared with 28% who thought immigration helped workers.

Views about the impact of immigrants on U.S. workers have shifted significantly in the past decade

% saying the growing number of immigrants working in this country ____ American workers

	Help			Hurt		
	2006	2016	Diff	2006	2016	Diff
All adults	28	42	+14	55	45	-10
Men	31	42	11	53	46	-7
Women	26	41	15	58	44	-14
Whites	22	32	10	61	54	-7
Blacks	25	42	17	64	44	-20
Hispanics	63	74	11	25	18	-7
18-29	43	56	13	46	33	-13
30-49	28	48	20	55	40	-15
50-64	23	32	9	60	53	-7
65+	17	28	11	64	57	-7
Bachelor's degree+	34	52	18	44	33	-11
Some college	28	34	6	56	53	-3
High school	22	35	13	63	53	-10
Less than high school	31	56	25	60	33	-27
$75,000+	30	43	13	49	44	-5
$30,000-74,999	25	38	13	59	49	-10
<$30,000	27	45	18	61	43	-18
Republicans	24	22	-2	61	67	6
Democrats	30	58	28	54	30	-24
Independents	25	40	15	57	45	-12

Note: Volunteered responses of "Not much effect" and "Don't know/Refused" not shown. Whites and blacks include only non-Hispanics. Hispanics are of any race. Cannot display data for Asians due to small sample size. "Some college" includes those with a two-year associate degree.
Source: Surveys of U.S. adults conducted May 25-June 29, 2016, and June 20-July 16, 2006.
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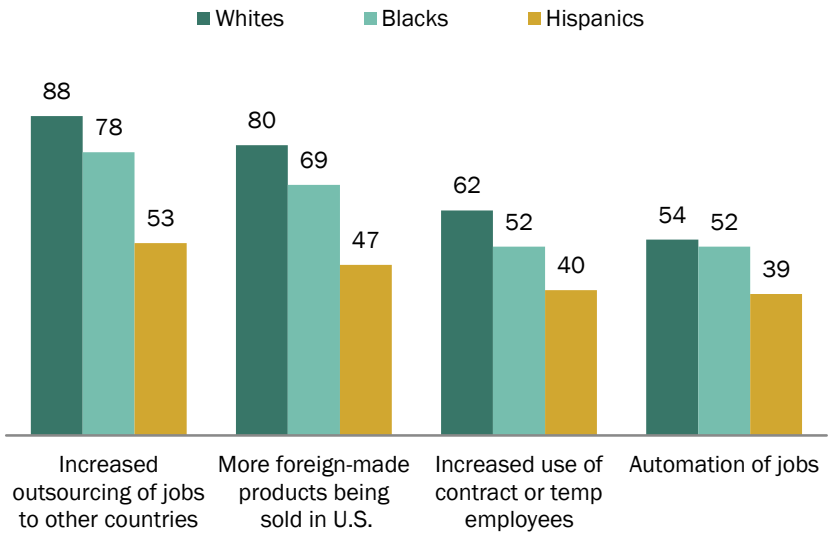
Some of the biggest increases in positive views about the impact of immigrants have come among Democrats, blacks, and those with less than a high school diploma. These groups are all notably more likely now than in 2006 to think the growing number of immigrants helps workers.

There are major political divisions over whether more immigrants help or hurt U.S. workers

In the current survey, there are sharp political divides on the impact of immigrants on the job situation. Two-thirds (67%) of Republicans say the growing number of immigrants working in this country *hurts* American workers, while only 30% of Democrats agree with this assessment. Roughly six-in-ten (58%) Democrats say this trend *helps* workers. Independents are split: 45% say immigrants hurt, while 40% say they help. The views of Democrats have substantially shifted and softened towards immigrants in the past decade. In 2006, fully 54% of Democrats said that the growing number of immigrants was hurting workers, while only 30% said it helped workers. Over this same period, Republicans' views have hardened somewhat, as a larger share now say having more immigrants in the U.S. hurts workers (67% today, up from 61% in 2006).

Whites are more likely than others to think several forces have hurt U.S. workers

% saying these factors hurt American workers



Note: Whites and blacks include only non-Hispanics. Hispanics are of any race. Cannot display data for Asians due to small sample size.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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There are also differences tied to race and ethnicity. In 2016, whites are more likely than Hispanics and blacks to think that growing numbers of immigrants hurt workers: 54% of whites say that, compared with 44% of blacks and 18% of Hispanics. A decade ago, 64% of blacks felt that more immigrants hurt U.S. workers. Thus, in the past 10 years there has been a 20-point drop among blacks in their view that immigrants hurt American workers. At the same time, there has been a

17-point increase in the share of blacks who believe that greater numbers of immigrants help workers.

In addition, age is tied to people's views about how the automation of jobs, the growing number of immigrants, the increased use of contract workers and the increase of imports are affecting American workers. Younger adults ages 18 to 29 are more likely than their elders to think these economic forces help American workers.

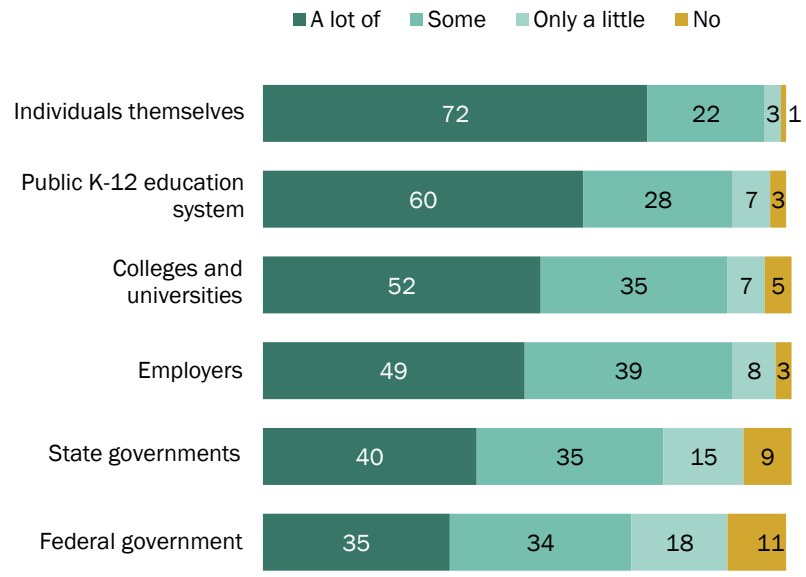
With the exception of the automation of jobs, whites are generally more likely than blacks or Hispanics to see harm in those instances. In addition, 88% of whites believe that increased outsourcing hurts American workers, compared with 78% of blacks and 53% of Hispanics.

People think workers themselves and public schools have the most responsibility to make sure the U.S. workforce has the right skills and schooling to be successful

Majorities of Americans assert that the main responsibility for preparing and keeping workers up to speed on their job requirements falls on individual workers themselves and the elementary and secondary public school systems. Roughly seven-in-ten (72%) believe that individuals have "a lot" of responsibility to

Americans think individuals and public schools should have the most responsibility to make sure workers have the right skills

% saying these groups should have ____ responsibility in making sure that the American workforce has the right skills and education to be successful in today's economy



Note: "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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make sure workers have the right skills and education to be successful. These views are strongly consistent throughout different groups. Majorities of every major demographic cohort believe that individuals have a lot of responsibility for their job preparedness.

Additionally, 60% say that public K-12 schools bear a lot of responsibility in preparing and training the workforce. For some groups this ranks nearly as high a factor in job preparedness as the role of individuals themselves. This is especially true among racial and ethnic minorities, those in poorer households, those with lower levels of education, and those who are Democrats.

After that, the public assigns responsibility this way: 52% believe colleges and universities have a lot of responsibility, 49% think employers have a lot of responsibility, 40% say state governments have a lot of responsibility, and 35% say the federal government has a lot of responsibility. It is useful to note that in the broadest terms there is the least support among people for the federal government holding a great deal of responsibility for preparing American workers to be successful.

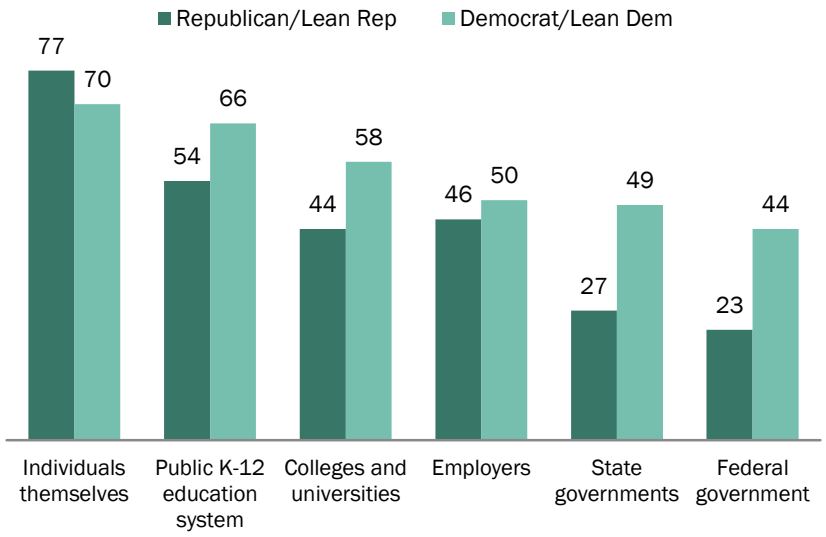
Beyond those broader patterns lie some other noteworthy demographic differences in people's assignment of responsibility for worker preparedness and skills acquisition.

A more detailed breakdown looks like this:

Individuals themselves: As noted, 72% of Americans say that people have a lot of responsibility to make sure they have the right skills and education to be successful in today's economy. Among those who are more likely than their demographic

Most say individuals are very responsible for job readiness; Democrats, more than Republicans, see a strong role for government, educational system

% saying these groups have a lot of responsibility in making sure that the American workforce has the right skills and education to be successful in today's economy



Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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counterparts to believe that are those living in households earning more than$75,000 (79%), those with a bachelor's degree or higher level of education (79%) or some college (75%), Republicans and independents who lean to the Republican Party (77%) and whites (74%).

The K-12 education system: Some 60% of all adults say that public elementary and secondary schools have a lot of responsibility in making sure workers are educated and have the right skills for today's economy. Among those more likely to support this idea than their counterparts: Democrats and Democratic leaners (66%), Hispanics (66%) and blacks (65%).

Colleges and universities: About half of Americans (52%) say that colleges have a lot of responsibility to make sure that U.S. workers have the rights skills and education to be successful in today's economy. Among the groups that are more likely than their counterparts to back that: Hispanics (63%), those who did not complete high school (62%) and Democrats and Democratic leaners (58%).

Employers: About half (49%) subscribe to the idea that employers have a lot of responsibility to make sure workers have the right skills and education to be successful in today's economy. Among those more likely than their counterparts to say this: Hispanics (61%) and blacks (54%), those with a high school diploma or less (55%), and those in households earning less than $30,000 (55%).

The federal government: About a third (35%) of adults say that the federal government has a lot of responsibility in making sure the American workforce has the right skills and education to be successful. Those more likely than their counterparts to believe this include Hispanics (56%), blacks (52%), those in households earning less than $30,000 (49%), Democrats and independents who lean Democratic (44%) and those with high school diploma or less (43%).

The same pattern of responses largely applies to those who say that state governments have a lot of responsibility in making sure that the American workforce has the right skills and education to be successful in today's economy. Overall, 40% of Americans believe that.

Americans think workers need a mix of technical, social and communications skills to succeed today

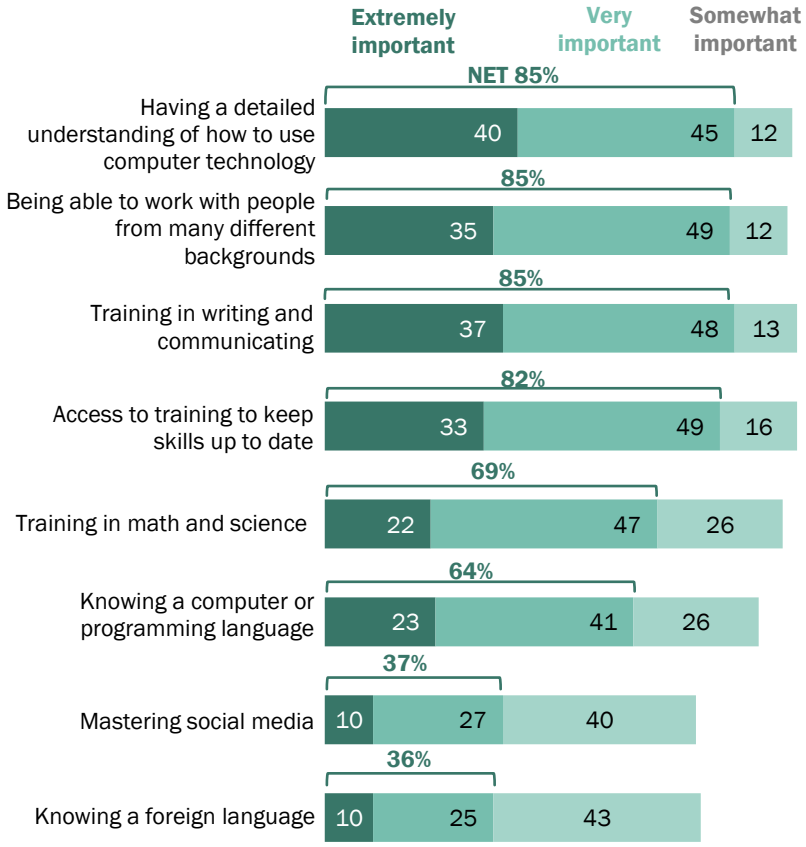
When people think about what it takes for workers to be successful these days, they rank several traits as highly important: knowledge of computers (85% say this is "extremely" or "very" important), ability to work with those from diverse backgrounds (85%), training in writing and communication (85%) and access to training to update skills (82%).

Next on the list comes training in math and science – 69% believe that is extremely or very important – and knowing computer programming (64%). A smaller share of Americans also believe that mastering social media (37%) and knowing a foreign language (36%) are at least very important for success in the modern workplace.

The traits most frequently cited as important by Americans are anchors of the skill set of workers in the knowledge economy. It is not surprising, then, that some of the starkest differences in people's answers are linked to their level of education. Those with higher educational attainment are more likely than others to think that knowledge of computers, writing and communications training, facility in working with people from many different backgrounds and access to more training on skills are extremely important for workers to be successful now. For instance, 46% of those with college degrees or higher and 44% of those with some college consider knowledge of computers to be extremely important, compared with 34% of those with a high school diploma or less.

Americans believe knowledge of computers, social dexterity, communications skills and access to training are keys to success for today's workers

% saying these traits are important for workers to be successful in today's economy



Note: NETs calculated before rounding.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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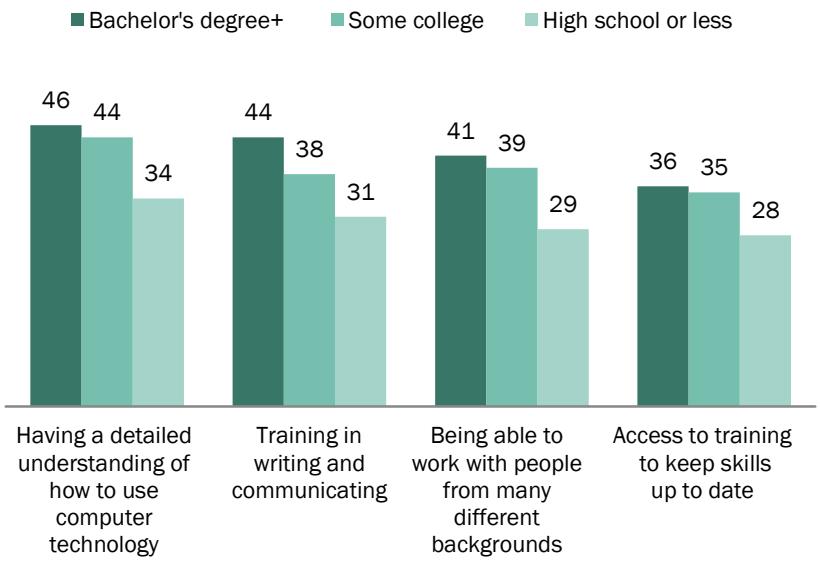
Those who work in the manufacturing and farm sectors and those who work in the hospitality industry are less likely than those who work in the education, trade or health care sectors to believe that mastering computer technology and having training in writing and communications

are extremely important traits to bring to the job.[23] Moreover, those who do manual labor are less likely than others to think that computer mastery and communications skills are essential for workers. Manual laborers are also less likely than others to believe workers should be able to work with people from many different backgrounds.

Women are more likely than men to cite some traits as extremely important for being a successful job holder in today's economy. Some 46% of women believe that having detailed understanding of computers is extremely important for successful workers compared with 34% of men who believe that. There is a similar-sized gender gap when it comes to training in writing and communication: 42% of women, vs. 32% of men, say this is an extremely important trait for today's workers to have.

Views on key skills for workers vary by education

% saying these traits are extremely important for workers to be successful in today's economy



Note: "Some college" includes those with a two-year associate degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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Additionally, there are some differences in people's views tied to race and ethnicity. Hispanics are less likely than blacks or whites to think that it is extremely important for worker success to know computer technology, be trained in writing and communications, and be able to work with others from diverse background. At the same time Hispanics are more likely than whites to think that knowing a foreign language and mastering social media are extremely important.

[23] The industries and occupations mentioned are not exhaustive but represent some of the most common responses given in the survey. See Methodology for details on how industries and occupations were classified.

3. How Americans view their jobs

On the whole, American workers are generally satisfied with their jobs. Even so, a significant share (30%) view the work they do as "just a job to get them by," rather than a career or a steppingstone to a career. Views about work are sharply divided along socio-economic lines, and the sense of vulnerability is most acute among workers with no college education and lower-than-average household incomes.

There are also significant differences across industries and occupations. For example, people who work in management are more likely to be satisfied with their current job, to be in salaried positions and to have a more robust set of employer-provided benefits. By contrast, workers who are in retail, service or manual occupations have fewer benefits and lower levels of satisfaction.

About half of U.S. workers describe their job as a career, while 18% say it is a steppingstone to a career. Three-in-ten workers say their job is "just a job to get them by." Those who describe their job as a career tend to be at least 30 years old and well educated, with higher incomes and holding full-time, salaried jobs.

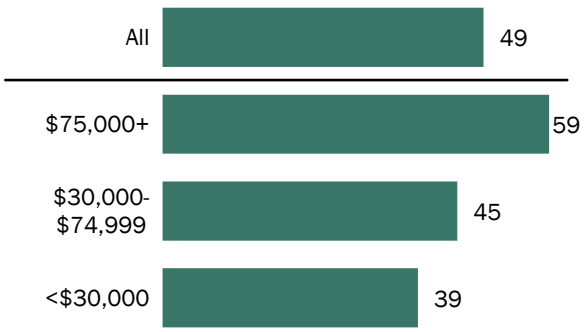
Highly educated workers among the most satisfied with their jobs

About half (49%) of American workers say they are very satisfied with their current job. Three-in-ten are somewhat satisfied, and the remainder say they are somewhat dissatisfied (9%) or very dissatisfied (6%). Job satisfaction varies by household income, education and key job characteristics. And the way people feel about their job spills over into their views of other aspects of their lives and their overall sense of happiness.

About six-in-ten (59%) of those with an annual family income of $75,000 or more say they're very satisfied with their current job, compared with 45% of those making $30,000 to $74,999 and 39% of those making less than $30,000.

Job satisfaction varies by family income

% of employed adults saying they are very satisfied with their current job



Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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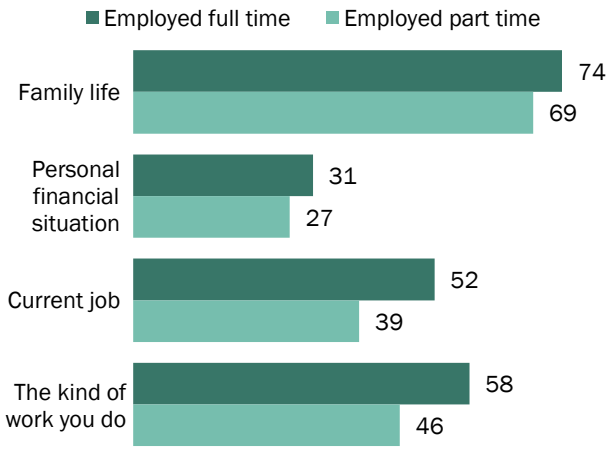
Certain types of employees are more likely to express satisfaction with their current job. People who work in management are particularly likely to say they are very satisfied (62%), compared with, for example, those who work in manual or physical labor (48%). In addition, those who work in full-time jobs (52%), salaried positions (58%) and permanent positions (53%) are particularly likely to say they are very satisfied with their current job.

When asked about their satisfaction with the kind of work they do, employed Americans with high family incomes again say they are the most satisfied (65% of those making $75,000 or more say they are very satisfied, compared with 49% of those making $30,000 to $74,999 and 51% of those making less than $30,000). Permanent, full-time and salaried employees are also more likely than their counterparts to say they are very satisfied in this area.

Full-time workers report being more satisfied than part-time workers with various aspects of life

% saying they are very satisfied with each aspect of their life



Note: "Current job" and "The kind of work you do" were asked of different samples.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Similar patterns are reflected when Americans are asked about satisfaction with their family life and personal financial situation, as well as their overall happiness.

For example, about six-in-ten adults (61%) with a family income of less than $30,000 per year say they are very satisfied with their family lives, compared with eight-in-ten adults whose family income is $75,000 per year or more.

There is also a difference by education. Though 71% of Americans overall describe themselves as very satisfied with their family lives, that figure is lower among those with less than a high school education (64%) than those with at least a bachelor's degree (75%).

About a third of Americans (32%) say they are very happy with how things are going these days in their lives, while 51% describe themselves as pretty happy and 14% say they are not too happy.

Large differences in happiness emerge when comparing those with high levels of education and income and those with low levels. For example, adults with less than a high school education are more than twice as likely as those with a bachelor's degree or more education to say they are not too happy with their lives (23% vs. 9%).[24] And those with low family incomes, of less than $30,000 annually, are three times as likely as those with family incomes of $75,000 or more to say they are not too happy (21% vs. 7%).

Those who are unemployed and looking for work are less happy with their lives, even when controlling for family income. Unemployed Americans who are looking for work and report a family income of less than $30,000 are about twice as likely as those who are employed and report the same family income to say they are not too happy with how things are going in their lives (26% compared with 14%).

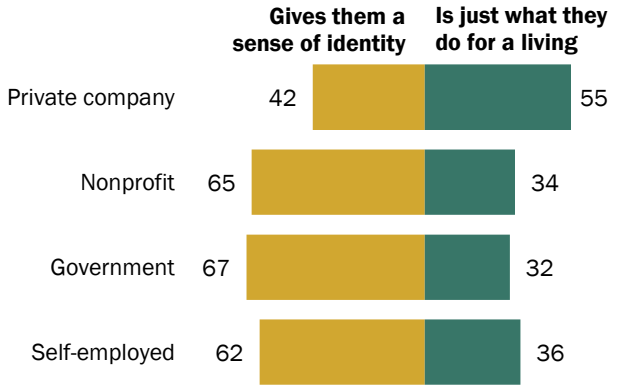
Americans are divided over whether their jobs give them a sense of identity or just provide a living

In addition to job satisfaction, the survey explored what American workers' jobs mean to them – are their jobs central to who they are, or are they mainly just a source of income? About half (51%) of employed Americans say they get a sense of identity from their job, while the other half (47%) say their job is just what they do for a living.[25] And about half (51%) of all U.S. workers say they view their job as a career, while 18% see it as a steppingstone to a career and 30% say it's just a job to get them by.

The same factors that underlie job satisfaction are linked to deeper attitudes about work. Workers with a postgraduate degree are the

Private sector employees less likely to say their job gives them a sense of identity

% saying their job ...



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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[24] Although there is a significant difference by education when looking at individuals who describe themselves as "not too happy," there is not a consistent difference when looking at those who say they are "very happy." For example, those with less than a high school education are just as likely (37%) as those with at least a bachelor's degree (38%) to say they are very happy.
[25] Respondents who reported that they have multiple jobs and do not consider one job to be their primary job were not asked this question, nor were they asked most of the survey questions about their current job. Those who said they have more than one job but consider one to be their primary job were asked to think about only their primary job when answering questions about their current job.

most likely to say their job gives them a sense of identity (77%), while 60% with a bachelor's degree, 48% of those with some college education and about four-in-ten (38%) of those with a high school diploma or less say the same. Similarly, employed adults with a bachelor's degree or more education are nearly twice as likely as those with less education to say their job is a career (70%, compared with 44% of those with some college experience and 39% of those with no college education).

Those at the top of the income scale are the most likely to see their job as part of their identity and as a career. Some 60% of those with an annual family income of $75,000 or more say they get a sense of identity from their job, compared with 37% of those with a family income of less than $30,000. And 75% of employed adults in the top income category ($75,000 or more) see their job as a career, compared with 49% of those in the middle ($30,000 to $74,999) and only 17% of those in the lowest income category (less than $30,000).

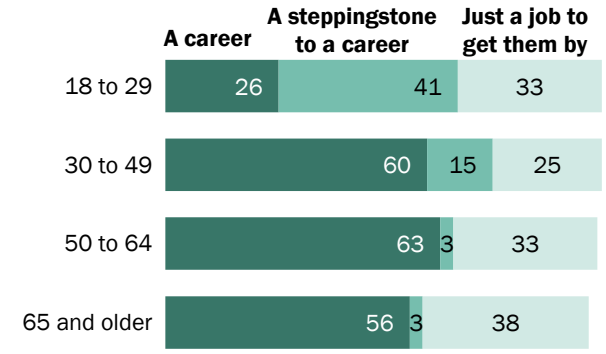
Roughly six-in-ten or more of those who are self-employed (63%) or who work for a nonprofit organization (65%) or the government (67%) say they get a sense of identity from their job, while only 42% of those who work for a private company say the same. Salaried and full-time employees are also more likely to say their job gives them a sense of identity than hourly and part-time employees, respectively.

At the same time, half or more of Americans who are self-employed (63%) or who work for a nonprofit organization (56%) or the government (66%) see their job as a career, while 44% of those who work for a private company say the same.

There are also some significant differences by industry. For example, 62% of adults working in the health care industry and 70% of those working in education say they get a sense of identity from their job, compared with 42% of people working in hospitality and 36% in retail or wholesale trade. And 66% of those working in a STEM profession or teaching say their job gives them a sense of identity, while 43% of those working in manual/physical occupations and 37% of those working in retail or service

Youngest adults most likely to see their jobs as steppingstones to a career

% of employed adults saying they think of their job as ...



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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jobs say the same.[26] Employees of the same industries and occupations that are most likely to report that their job provides them with a sense of identity (health care, education and STEM/teaching) are more likely than others to say their jobs are careers.

Job characteristics are also linked to these attitudes about work. A quarter of part-time employees see their job as a career, while 22% consider it a steppingstone and 52% say it's just a job to get them by. But among full-time workers, 58% view their job as a career, 17% say it's a steppingstone to a career and 24% say it's just a job to get them by.

Younger workers are significantly less likely than middle-aged and older workers to view their job as a career (26% of those ages 18 to 29) and more likely to describe it is a steppingstone to a career (41%). If this age group follows the path of older adults, many of those "steppingstone" jobs will indeed lead to careers.

Among young adults, though, there is a sharp divide by education. Those with at least a bachelor's degree are about twice as likely as those with less education to say their job is a career (41%, compared with 21% of those with some college experience and 22% of those with a high school diploma or less). These groups with lower education are more likely to say their job is just to get them by.

The share of U.S. workers saying their job gives them a sense of identity has dropped somewhat since the question was first asked by Gallup in 1989. Then, 57% of employed adults said their job gave them a sense of identity, compared with 51% today.

Most Americans overall feel their jobs are secure

Americans' confidence in their job security remains high after reaching a low in the early 1980s. Today, 60% of employed Americans say it is not at all likely that they will lose their job or be laid off in the next 12 months. An additional 28% say it is not too likely, 7% say it is fairly likely and 5% say it is very likely.

Even so, a segment of the U.S. workforce expresses a high level of vulnerability. Among workers with less than a high school diploma, about four-in-ten (39%) say it's very or fairly likely they may be laid off within 12 months. By comparison, only 11% of those with a high school diploma, 10% of those with some college education and 7% of those with at least a bachelor's degree say the same.

[26] The industries and occupations mentioned are not exhaustive but represent some of the most common responses given in the survey. See Methodology for details on how industries and occupations were classified.

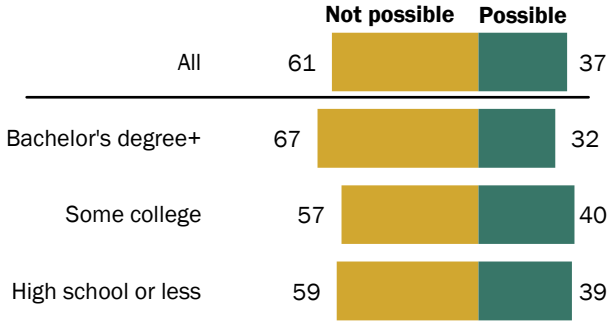
Similarly, those in the lowest family income bracket of less than $30,000 annually are four times as likely as those with family incomes of at least $75,000 and three times as likely as those with incomes between $30,000 and $74,999 to say they're very or fairly likely to lose their job in the next year (24% vs. 6% and 8%, respectively).

Certain types of workers are more likely to feel their jobs are insecure. For example, 23% of temporary workers say they are very or fairly likely to lose their job in the next 12 months, compared with 8% of those who describe their jobs as permanent positions.

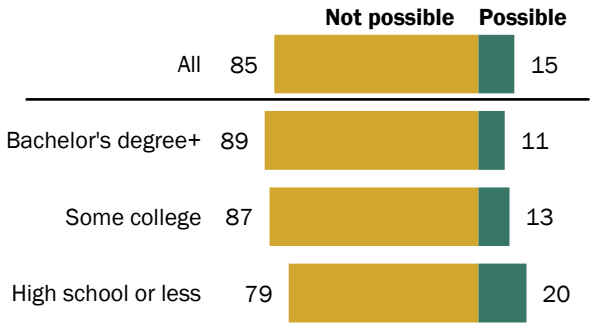
People who work in manual or physical occupations such as maintenance workers, farmers and construction workers are more likely than those in other popular occupations to say they may be laid off in the next year (for example, 16% of these workers say they're very or fairly likely to lose their job, compared with 8% of those working in management). Those who work in small companies of less than 50 employees (16%) are more likely than those working in larger workplaces to say they are very or fairly likely to lose their job.

Most feel their jobs are secure from outsourcing and automation

% of employed adults who are not self-employed saying it would be ... for their employer to hire someone outside of the country to do the job they are doing now



% of employed adults who are not self-employed saying it would be ... for their employer to use technology to replace the job they are doing now



Note: "Don't know/Refused" responses not shown. "Some college" includes those with a two-year associate degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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While relatively few workers say it's likely that they will lose their job in the next 12 months, a sizable minority (37%) of those who are not self-employed say it would be possible for their employer to outsource their job to a worker outside of the U.S. This is up somewhat from 2006, when 31% believed this would be possible.

Those without a college degree and those with low family incomes are more likely to say their jobs could be outsourced. About four-in-ten workers with a high school education or less (39%) or with some college experience (40%) say this, compared with 32% of those with at least a bachelor's degree. Workers with a low level of family income (less than $30,000) are more likely than those

with family incomes of $75,000 or more to say it would be possible for their employer to replace them by hiring someone outside of the country (41% vs. 33%).

Relatively few U.S. workers believe that their jobs could be replaced with technology. Some 15% of workers who are not self-employed say their employer could use technology to replace the job they are currently doing; 85% say this wouldn't be possible.

This is in line with previous research that found that, while 65% of adults predict that robots and computers will do much of the work currently done by humans within 50 years, 80% of workers expect that their own jobs will still exist in their current forms in the same time period.

Workers with a high school diploma or less education are more likely than those with higher levels of education to say it is possible that their jobs could be replaced with technology (20%, compared with 13% of those with some college experience and 11% of those with at least a bachelor's degree). And those with a family income of less than $30,000 annually are more likely than those with an income of $75,000 or greater (23% vs. 9%) to say their job could potentially be replaced.

Though workers who are paid by the hour (19%) are more likely than salaried employees (9%) to say their jobs could be replaced by technology, there are no statistically significant differences between full- and part-time workers.

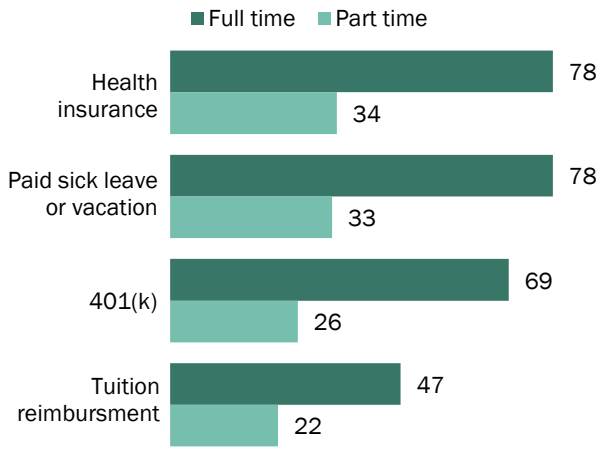
People who work in management professions (5%) are less likely than those in other popular occupations to say it's possible that their job could be replaced by technology

Full-time workers much more likely than part-timers to have job benefits

According to the Pew Research survey, a majority of workers report that they have access to health insurance (68%), paid sick leave or vacation (67%) and a 401(k) or other retirement program (59%) through their employer. Census data show that the share of workers with employer-provided health

Wide gap in benefits offered to full- and part-time workers

% saying their employer offers ... to them



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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insurance and access to employer-sponsored retirement plans have fallen in recent decades. (See Chapter 1 for more details.)

Across the board, these benefits are more common among workers with at least a bachelor's degree, but around half or more of workers with less education still report access to these employer-provided benefits. The youngest and oldest segments of the workforce – those who are 18 to 29 or 65 and older – are less likely to be offered each benefit.

Full-time workers are at least twice as likely as part-time workers to say that their employer offers each of these benefits to them. For example, 69% of full-time employees can access a 401(k) or other retirement program through their employer, compared with only 26% of part-time workers.

In general, those who work for the government (including federal, state and local) are the most likely to say they have access to these benefits (for example, 87% say they have access to health insurance). Private company and nonprofit employees are somewhat less likely to say their employer offers health insurance coverage (74% and 72%, respectively) and self-employed workers report a much lower rate (25%).

About four-in-ten (41%) American workers also say their employer provides tuition reimbursement for skills training or additional education. While those who are highly educated, those with high incomes, and full-time and government workers are more likely to have access to tuition reimbursement than their counterparts, 18- to 29-year-olds are just as likely to say they are offered this benefit as middle-aged workers.

These estimates of workers' access to employer-provided benefits are similar to those found by the Bureau of Labor Statistics.

Majority of full-time and part-time workers are satisfied with their work schedules

Full-time and part-time workers were asked about their work schedule preferences. Full-time workers were asked if they would prefer to be working part time, and part-time workers were asked if they would prefer full-time work. For the most part, both groups are satisfied with their current schedules.

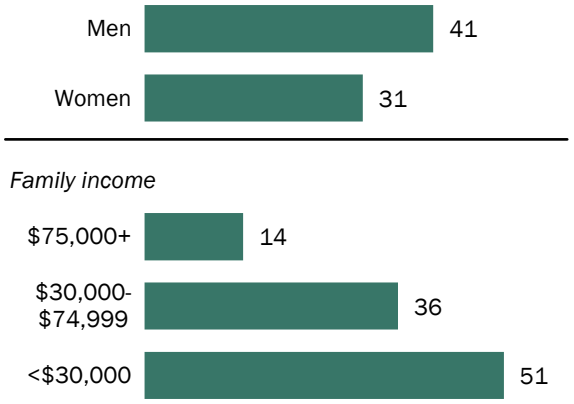
About a third of part-time workers (36%) say they would prefer to be working full time, while 64% say they would not. Men who work part time are more likely than women to say they would prefer to work full time (41% vs. 31%). Similarly, part-time working parents of children under the age of

18 living in their household are more likely than non-parents to say they would prefer to work full time (44% vs. 32%).

Among part-time workers, those with family incomes of less than $30,000 (51%) are more likely than those with higher incomes to say they would prefer to be working full time, with about half falling into this underemployed group. By contrast, 36% of part-time workers with a family income between $30,000 to $74,999 and an even smaller share (14%) among those with a family income of $75,000 or more say they would prefer a full-time job.

Men more likely than women to feel underemployed

% of those working part time who say they would prefer to be working full time



Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Most full-time workers report that they prefer that schedule (80%, compared with 20% who say they would rather work part time). There are relatively few demographic differences in this group. Women who work full time are more likely than men to say they would rather work part time (25% vs. 16%), but parents with children under the age 18 living in their household are just as likely as non-parents to say they prefer their full-time work. While those with lower family incomes are somewhat more likely to prefer part-time work than those with high incomes, there are few differences by education.

One-in-five adults who are not currently working say they are actively looking for a job. Men (23%) are more likely than women (18%) to fall into this category. And the youngest Americans are much more likely than the oldest segment of the population to be job hunting. About half (49%) of 18- to 29-year-old adults who are not employed say they're looking for work, compared with 38% of those ages 30 to 49, 17% of those ages 50 to 64, and only 2% of those ages 65 and older. Adults who are not employed and have at least a bachelor's degree (13%) are less likely than those with less education to be looking for work.

4. Skills and training needed to compete in today's economy

There is a widespread feeling among U.S. adults that the workplace is evolving and they will have to continually update their skills and training in order to succeed in a career. A narrow majority (54%) of adults who are currently in the labor force say that it will be essential for them to get training and develop news skills throughout their work life in order to keep up with changes in the workplace. An additional 33% say this will be important, but not essential. Only 12% of workers say ongoing training will not be important for them. Even among employed adults who say they have the skills and education they need to get ahead in their job, roughly half (47%) say they will need ongoing training throughout their career.

For some people, acquiring new skills won't be a necessity just in the future: 35% of working adults say they need more education and training now in order to get ahead in their job or career. A plurality of those who say they need more training say the best way for them to get that training would be through additional higher education. This is true across levels of educational attainment: Pluralities of four-year college graduates say they would pursue a graduate degree, two-year college graduates say they would try to get a four-year degree, and high school graduates say they would go to college. About a third of workers who say they need more training believe receiving on-the-job training would be the best way to gain the skills they need to get ahead, while fewer point to certificate programs as the most promising pathway.

Roughly four-in-ten employed adults (45%) say they have taken a class in the past year or have gotten extra training to learn, maintain or improve their jobs skills. About half of these workers report that they did this at the behest of their employer, but significant shares also report that they sought out additional training in order to earn more money, get a new job or get a promotion.

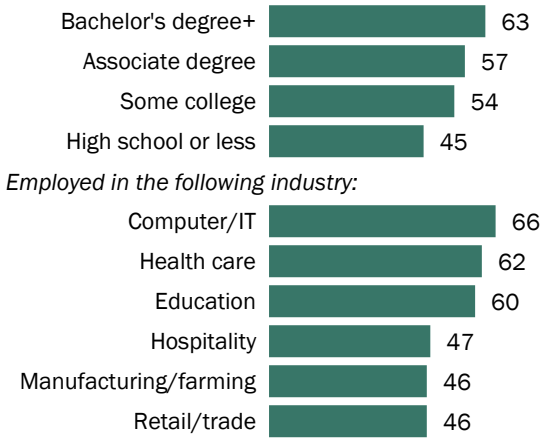
While the skills American workers rely on to do their jobs vary widely by education and industry, interpersonal, communications and analytical skills are the most dominant across fields. And the skills that U.S. workers are using in their jobs these days don't necessarily coincide with what most Americans view as the cutting-edge job skills of today. While an overwhelming majority of adults (85%) say having a detailed understanding of how to use computer technology is extremely or very important for a worker to be successful in today's economy, far fewer employed adults say they need this skill set in their current job.

Many say ongoing training and skills acquisition are essential in today's workplace

Overall, 54% of U.S. adults in the labor force say that, in order to keep up with changes in the workplace, it will be essential for them to get training and develop new skills throughout their work life. A third say, while not essential, it will be important for them to continually update their skills. Young adults are more likely than their older counterparts to see skills and training as essential (61%), perhaps because of the longer trajectory they have ahead of them. Even so, 56% of those ages 30 to 49 say ongoing training will be essential for them, as do roughly four-in-ten workers ages 50 and older.

More educated workers see greater need for ongoing training and skills development

% of adults in the labor force saying it will be essential for them to get training/develop new skills throughout their work life in order to keep up with changes in the workplace



Note: "In the labor force" includes those who are employed and those who are unemployed but looking for work. "Some college" includes those who have attended college, but have not earned a degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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There is a significant education gap in perceptions about the need for ongoing training and skills development. Fully 63% of those with a bachelor's or graduate degree say it will be essential for them to update their skills in order to keep up with the pace of change in the workplace. Some 57% of those with a two-year college degree say this will be essential for them, as does a similar share of those with some college education but no degree (54%). Among those with a high school diploma or less, 45% say it will be essential for them to get training and develop new skills throughout their career.

Adults who are working in certain STEM-related industries are among the most likely to say ongoing training and skills development will be essential for them. Two-thirds of employed adults (66%) who work in computer programming and information technology say this will be essential for them. And roughly six-in-ten workers who are in the health care industry (62%) say the same. By contrast, about half of adults working in hospitality (47%), manufacturing or farming (46%) or

retail or wholesale trade (46%) see training and skills development as an essential part of their future work life.[27]

Significant share of workers have taken a class or gotten extra training in the past year

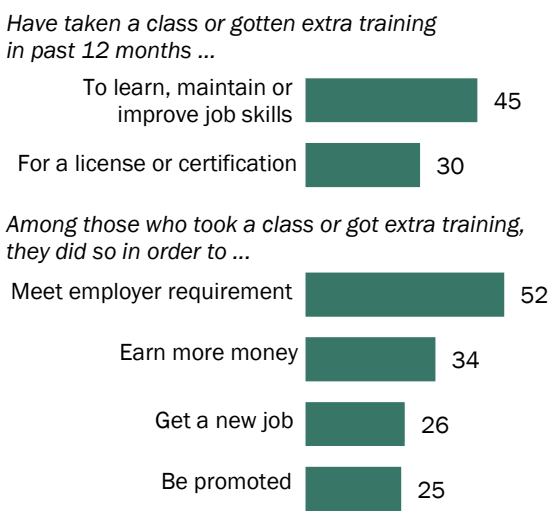
To be sure, many workers are already engaged in an ongoing effort to improve their skills or learn new ones. Fully 45% of employed adults say that, in the past 12 months, they have taken a class or gotten extra training to learn, maintain or improve job skills. Workers younger than 50 are somewhat more likely than those ages 50 and older to say they have sought out this type of training (47% vs. 39%).

In keeping with the finding that more highly educated Americans are among the most likely to say they will need to keep their skills up to date throughout their work life, 56% of working adults with a bachelor's degree or more education say they have taken a class or gotten training in the past 12 months, as do 54% of those with a two-year college degree. Among those with some college education, 43% say they have taken a class or received training in the past 12 months. By comparison, 30% of workers with a high school diploma or less education say they have done this.

Roughly six-in-ten workers in the health care (58%) and education (62%) fields say they have gotten training or taken a class in the past year.[28] Workers in the hospitality (28%), retail and trade (32%) and manufacturing and farming (34%) sectors are significantly less likely to report the same.

Many workers have taken a class or gotten training in past year, often because employer required it

% of employed adults



Note: Findings on reasons for taking a class/getting extra training are based on those who did so to either (1) learn, maintain or improve skills or (2) for a license or certification.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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[27] The industries and occupations mentioned are not exhaustive but represent some of the most common responses given in the survey. See Methodology for details on how industries and occupations were classified.
[28] Due to small sample size, there are too few cases to analyze this question by adults who work in computer programming or information technology.

Workers are somewhat less likely to report having taken a class or gotten extra training for a license or certification – 30% of all workers say they have done this over the past year. Once again college graduates are among the most likely to have taken these steps, while those who never attended college are among the least likely.

Adults who work in the health care industry are among the most likely to say they have had training or taken a class related to licensing or certification – fully half (49%) say they have done this in the past year. About a third of workers in the education sector (32%) say they have taken a class related to licensing or certification in the past year, as do roughly a quarter of those working in manufacturing and farming and in hospitality.

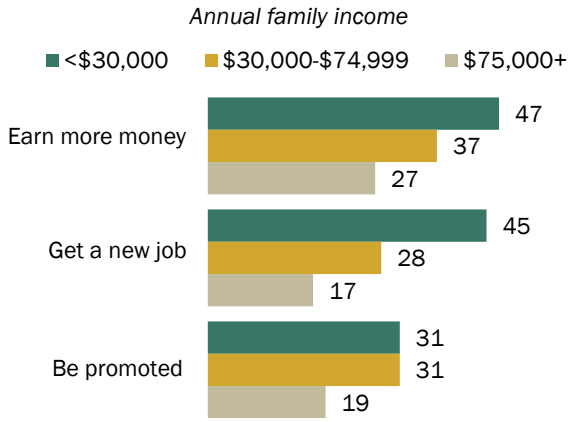
Employers often provide the impetus for workers to get additional training, but desire for job advancement is also a motivator

Overall, 37% of employed adults report that they have taken a class or gotten extra training – either to improve their job skills or work toward a license or certification. Among this group, about half (52%) say they did this because their employer required it. Roughly a third (34%) say they needed the extra training in order to earn more money. And about a quarter say they needed the extra training in order to get a new job (26%) or to be promoted in their current job (25%).

Younger workers who took a class or got extra training in the past year are much more likely than their older counterparts to say they needed to do this in order to get a new job – 38% of workers younger than 30 say this is a reason that they got extra training, compared with roughly one-in-five (21%) workers age 30 or older.

Lower-income workers who seek additional training are motivated by wages, new job opportunities

% of employed adults who took a class or got extra training in the past year in order to ...



Note: Based on those who took a class/got additional training either to (1) learn, maintain or improve skills or (2) for a license or certification.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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The motivations for seeking additional training are highly correlated with workers' income. Among those who say they took a class or got additional training in the past year, 47% of workers with annual household incomes less than $30,000 say they did this in order to earn more money.

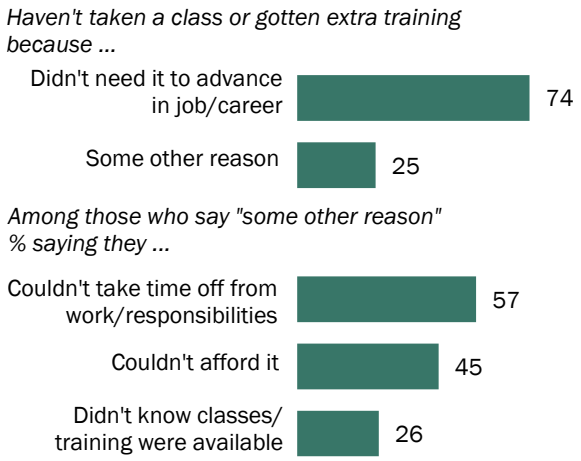
Some 37% of middle-income workers (those earning between $30,000 and $74,999) say the same. And for those with incomes of $75,000 or more, only 27% say earning more money was a reason why they sought additional training.

Similarly, while 45% of lower-income workers say they took a class or got more training in order to get a new job, fewer middle-income (28%) and higher-income (17%) workers say the same.

Among workers who have *not* taken a class or gotten extra training in the past year, the vast majority (74%) say they didn't need to take these steps in order to advance in their job or career. For the remaining 25% of this group, having the time and resources to seek out additional training can be significant barriers.

Limitations on time and resources can hold some workers back from getting additional skills training

Among workers who did not take a class or get extra training in the past 12 months, % saying



Note: "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Among those who may have needed training in order to advance in their job but did not get it, some 57% say that the inability to take time off from work or from other responsibilities was a contributing factor. (This translates into 14% of all workers who did not take a class or get extra training in the past 12 months.) And 45% of these workers say they couldn't afford to take a class or get additional training. Relatively few (26%) say that they didn't know this type of training was available.

Roughly one-in-four job seekers took a class or got skills training in the past year

Among adults who are unemployed but looking for work, 26% say they took a class or got extra training in the past year to help them get a job. Those with at least some college education are significantly more likely than those who never attended college to say they took this step (34% vs. 18%).

Among those who did not take a class or get additional training in order to help them get a job, 64% say they couldn't afford to do so. Some 55% say they couldn't take time away from other responsibilities, and 35% say they didn't know this type of training was available.

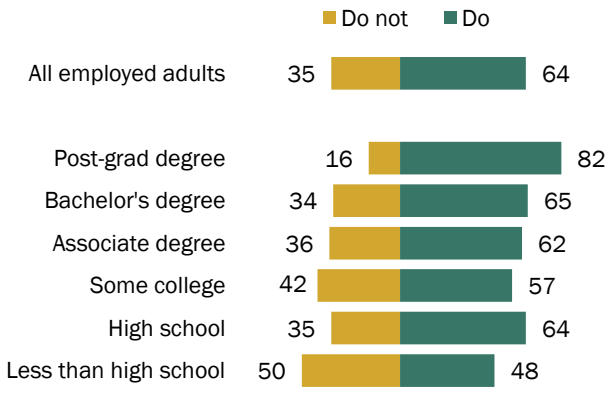
About a third of today's workers say they don't have the education and training they need to get ahead at work

While most workers expect training and skills development to be an integral part of their work life in the future, and many are taking classes and getting certifications in real time, about a third (35%) of workers say they lack the education and training necessary to get ahead in their current job; 64% of employed adults say they have the education and training needed to get ahead.

Not surprisingly, younger workers are among the most likely to say they do not have the necessary training to get ahead in their current job. Some 46% of workers younger than 30 say they don't have the education and training they need to get ahead in their job. About a third (34%) of workers age 30 to 49 say the same, as do 26% of workers ages 50 and older.

Roughly a third of bachelor's degree holders – with no postgrad degree – say they need more education and training to get ahead in current job

% of employed adults saying they ___ have the necessary education/training to get ahead in their current job



Note: "Some college" includes those who have attended college, but have not earned a degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Educational attainment is linked to workers' feelings of job preparedness, but mainly at the extremes. Workers with a postgraduate degree are by far the most likely to say they have the necessary education and training to get ahead in their job or career. Among this group, 82% say they have what they need to get ahead; only 16% say they need more education and training.

Among workers with a bachelor's degree, a two-year college degree, some college or a high school diploma, roughly equal shares say they need more education and training in order to get ahead in their current job. Workers who lack a high school diploma are among the most likely to say they need more education and training (50%); only about half (48%) say they have the training they need to get ahead.

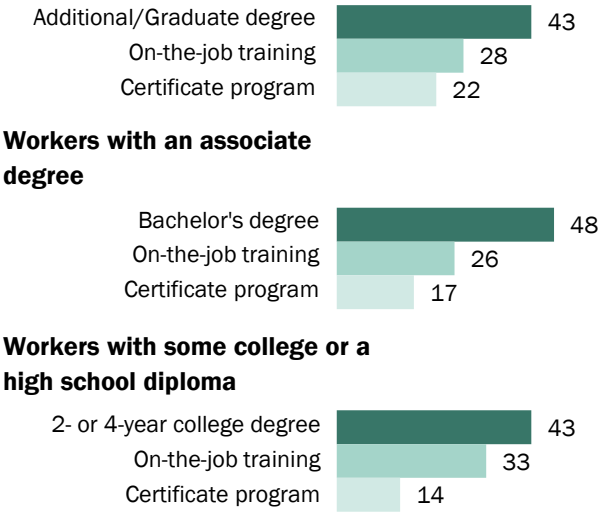
Higher education and on-the-job training are seen as best avenues for further skills development

For workers who feel ill-equipped to get ahead in their current job, there is no clear-cut solution for obtaining more education and training. Pluralities say going back to school to obtain a higher degree would be the best way to get the training they need. But a significant share say on-the-job training aimed at learning or improving a specific skill would be the best approach for them to take. A smaller share say pursuing a certificate program in a professional, technical or vocational field would be the best way for them to get the training they need.

Among workers with a bachelor's or graduate degree who say they need more education or training to get ahead in their career, 43% say the best way for them to get the training they need would be to pursue postgraduate education (a graduate degree for those with a bachelor's, and an additional graduate or professional degree for those who've already completed graduate schooling). About three-in-ten (28%) of these workers say on-the-job training would be the best avenue to pursue, and 22% say they would complete a certificate program.

For workers who need more training to get ahead in their job, pluralities point to formal education as the answer

Among those who need more education/training to get ahead in their current job, % saying ____ would be the best way to get it



Note: Workers with a graduate degree were asked if they would get an additional graduate/professional degree; those with a bachelor's degree were asked if they would get a graduate/professional degree; those with some college or a high school diploma were given the option of choosing a two-year associate's degree or a four-year college degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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The pattern is similar for workers with less formal education who say they need more training to get ahead in their job. Among those with a two-year college degree, 48% say they would get a four-year degree, while 26% say on-the-job training would be the best approach to take and 17% say they would complete a certificate program.

And for those who haven't completed college, a plurality (43%) say they would pursue a two-year or four-year college degree in order to gain the training they need to get ahead at work, a third would turn to on-the-job training and 14% say they would complete a certificate program.

Across levels of educational attainment, women are more likely than men to say that pursuing formal education would be the best way to get the training they need to get ahead in their current job. Among those who say they need more education and training, 52% of women and 35% of men say getting a higher degree would be the best approach. Men are more likely than women to say that on-the-job training would be best (36% vs. 25%) or to say they would pursue a certificate program in order to get the training they need (20% vs. 13%).

Workers who say they would opt for on-the-job training are mostly positive about their prospects for getting it. A majority (65%) say their employer offers this type of training. An additional 14% say that while the training may not be offered in their workplace, their employer would help them get the training they need. Some 16% say their employer would not assist them in getting training.

Among adults who are unemployed and looking for work, only about half (46%) feel they have the education and training needed to get the kind of job they want; 52% say they need more education or training. These job seekers are divided over the best approach to getting the qualifications they need. About four-in-ten (42%) say getting additional formal education would be the best way. Roughly the same share (37%) say completing a certificate program in a professional, technical or vocational field would be a better strategy. An additional 16% point to some other approach.

Half of all workers say interpersonal skills are crucial to their job

In today's high-tech, information economy, most American workers rely more on soft skills than on technical skills to do their jobs. Fully half of employed adults say interpersonal skills such as patience, compassion and getting along with people are extremely important in their job. An additional 40% say these skills are very important. This skill set is especially important for workers who are in the health care and education sectors – 64% of health care workers and 67% of education workers say it's extremely important for them to have interpersonal skills in order to do their job.

A similar share of workers say they rely heavily on critical thinking skills such as evaluating facts and making decisions in doing their jobs. Some 46% of all workers say these skills are extremely important in doing their job, and 40% say they are very important. Again, these skills are more

important to workers in the health care and education fields than they are for workers in the hospitality, manufacturing and farming, and retail sectors.

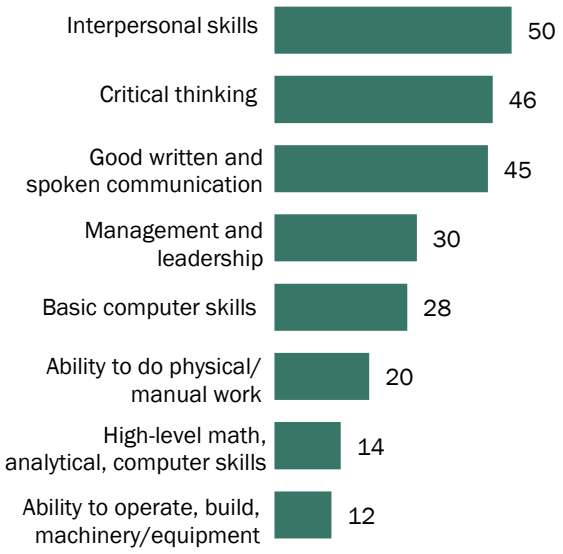
Good written and spoken communications skills are highly important as well. Some 45% of workers say it is extremely important that they have good communications skills in order to do their job, and 44% say this is very important. These skills are most important for people working in education.

Management and leadership skills are extremely important for three-in-ten of today's workers, and an additional 40% say these skills are very important. These skills cut across industries, with roughly equal shares of workers saying they rely on them to do their job.

About three-in-ten workers (28%) say computer skills such as word processing or creating spreadsheets are extremely important for their job.

Amid demand for high-skilled jobs, people skills still matter a lot

% of employed adults saying it is extremely important that they have ____ in order to do their job



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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A third tier of job skills includes a mix of analytical and manual skills. Some 14% of workers say it's extremely important for them to have high-level math, analytical or computer skills in order to do their job, and an additional 25% say these skills are very important.

One-in-five workers say the ability to do physical or manual work or use hand tools is extremely important in their job, and 12% say it's extremely important for them to be able to operate, build or repair machinery or equipment. As would be expected, these skills are particularly important for workers in the manufacturing and farming industries, and they are also relied upon by those who work in the hospitality or service industries.

The skills that American workers use in their jobs differ considerably by educational attainment. Even among college graduates, there are significant differences in the skills

Soft skills trump technical skills for most workers, but level of importance varies widely by educational attainment

% of employed adults saying it is extremely important that they have _____ in order to do their job

	Total	Postgrad degree	Bachelor's degree	Some College	High school or less
Interpersonal skills	50	59	56	50	42
Critical thinking	46	67	54	44	35
Good written and spoken communication	45	64	51	42	35
Management and leadership	30	37	35	30	25
Basic computer skills	28	48	40	24	17
Ability to do physical/manual work	20	5	13	22	28
High-level math, analytical, computer skills	14	17	17	12	11
Ability to operate, build, machinery/equipment	12	2	7	13	18

Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. "Some college" includes those with a two-year associate degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
"The State of American Jobs"

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used by workers with a graduate or professional degree compared with those with a bachelor's degree. For example, on critical thinking, 67% of workers with a postgraduate degree say it's extremely important for them to have these skills in order to do their job. Some 54% of workers with a bachelor's degree but no graduate degree say the same. A similar gap exists between these two groups of workers when it comes to having good written and communications skills.

There are also large gaps between those with a bachelor's degree and those with an associate's degree or some college experience but no degree. For example, 40% of workers with a bachelor's degree say basic computer skills are very important in their job; 24% of those with some college but no bachelor's degree say the same.

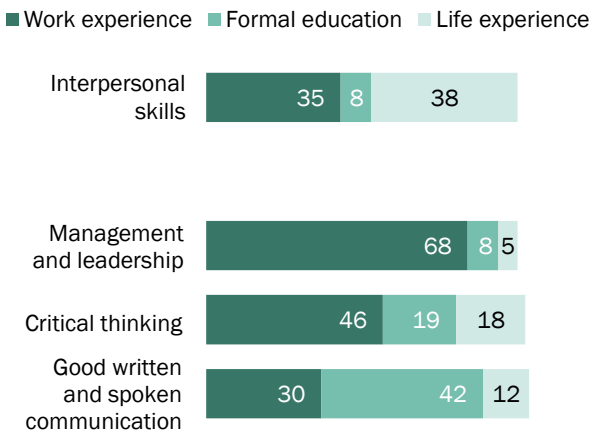
In addition, there are significant skills gaps between those with some college experience and those who never attended college when it comes to using interpersonal skills, critical thinking, communications skills, management and basic computer skills at work. Workers who never attended college are more likely than those with higher levels of education to say they rely heavily on their ability to perform manual and physical work and to operate machinery or equipment in doing their job.

Workers learn many key skills on the job

The skills that workers rely on are acquired in a variety of venues. The survey finds that on-the-job experience is an important training ground for many of today's workers. Still, when it comes to interpersonal skills, such as patience, compassion and the ability to get along with others, many also point to life experience or self-teaching. Among workers who say that having interpersonal skills is extremely or very important in order for them to do their job, some 35% say they learned those skills on the job, while 8% say they honed those skills through their formal education. But a sizable share – 38% – volunteer that they taught themselves those skills or came by them naturally. (The remaining share say they learned these skills in some other way or in some combination of work, school and training.)[29]

In acquiring soft skills, workers rely on a mix of schooling, on-the-job training and natural ability

Among workers who said ____ is important for their job, % saying they learned this skill mainly through ...



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. For respondents who ranked more than one item as "extremely" or "very" important to their job, a random item was selected. "Life experience" is a volunteered response. "Specialized training," "Some other way" and volunteered responses of "Some combination" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Other soft skills such as management, critical thinking and communications skills are acquired in different ways, according to the workers who rely on those skills to do their jobs. Among workers who said management or leadership skills are extremely or very important for their job, a majority (68%) say they learned those skills through work experience. Only 8% say they learned those skills in their formal education, and 5% say they taught themselves those skills.

Work experience is also a valuable source of learning for workers who say it's important for them to have critical thinking skills in their job. Some 46% of this group says they learned these skills on

[29] Respondents were asked how they learned one skill that they listed as extremely or very important for their job. Respondents who ranked only one skill as "extremely important" were asked about that skill. If they ranked more than one skill extremely important, one of those skills was randomly chosen. Respondents who did not rank any skills extremely important but ranked one skill "very important" were asked about that skill. If they ranked no skills extremely important but ranked more than one skill very important, one of those skills was randomly chosen.

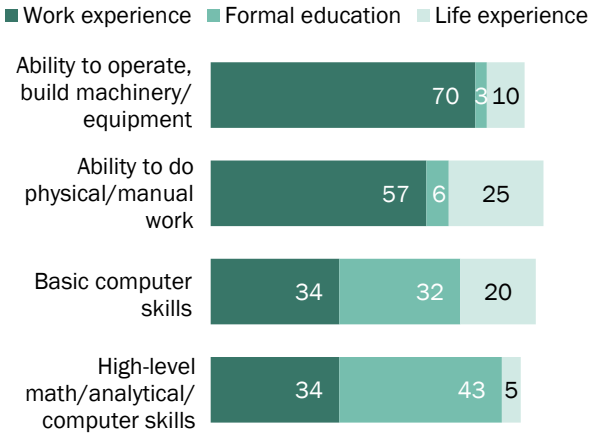
the job. About one-in-five (19%) say they acquired these skills in their formal education, and a similar share (18%) say they gained these skills through life experience.

Workers are more divided when it comes to where they learned written and spoken communications skills: 42% say they picked up these skills through their formal education, while 30% say they learned these skills through work experience. An additional 12% say they learned these skills through life experience or self-teaching. Those with at least a bachelor's degree are more likely than those with less education to say they learned communications skills and critical thinking through their formal education.

For some other job skills that are less widely relied upon, on-the-job training is also crucial to learning. Among workers who say being able to operate, build or repair machinery or equipment is extremely or very important for their job, 70% say they learned these skills through work experience, while only 3% say they acquired these skills through formal education. One-in-ten say they learned those them through life experience.

Formal education is relied upon more for math, analytical and computer skills

Among workers who said ____ is important for their job, % saying they learned this skill mainly through ...



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. For respondents who ranked more than one item as "extremely" or "very" important to their job, a random item was selected. "Life experience" is a volunteered response. "Specialized training," "Some other way" and volunteered responses of "Some combination" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Similarly, many workers who say it's very important for them to be able to do physical or manual work or use hand tools say they learned those skills on the job rather than through formal education (57% vs. 6%). One-in-four volunteer that those skills came through life experience.

Workers who rely on basic computer skills and high-level analytical skills say they picked those skills largely through a combination of work experience and formal education. Among those workers who say basic computer skills such as word processing and creating spreadsheets are important skills for them to have, 34% say they learned these skills on the job, while a similar share (32%) say they learned these skills through their formal education (20% volunteer life experience).

When it comes to high-level math, analytical or computer skills, 43% of workers who say these are central to their jobs say they learned these skills in their formal education. Some 34% say they learned them through work experience. Relatively few (5%) say they picked these skills up on their own.

Roughly seven-in-ten workers say they may not need their level of formal education in order to do their job

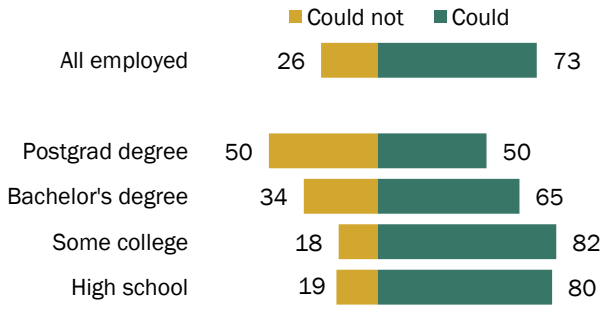
Another finding from the survey echoes the notion that, for many workers, the most important job skills they have are developed in the workplace rather than in the classroom. A solid majority (73%) of employed adults say that someone with less education than them could develop the skills and knowledge needed to do their job.

Workers with a graduate or professional degree stand out in this regard. This is the only group of workers in which a majority does not say others with less education could be trained to do their job. Even so, 50% of working adults with a postgraduate degree say someone without a similar degree could develop the skills and knowledge to do their job; 50% say they don't think someone with less education could do it.

Among those with a bachelor's degree, 65% say someone with less education could learn to do their job, and the shares are significantly higher among those with some college (82%) and those with a high school diploma (80%).

Most college graduates say someone with less education could learn to do their job

% of workers saying someone with less education ____ develop the skills and knowledge to do their job



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. Respondents were asked specifically about their level of education (e.g., Could someone without a "four-year college degree" develop the skills and knowledge to do your job?). Those without a high school diploma were not asked this question. "Some college" includes those with a two-year associate degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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The relatively small share of workers (14%) who say they rely heavily on high-level math, analytical or computer skills to do their job are among the most likely to say someone with less education than them could *not* develop the skills to do their job (39% say so). By comparison, among those who say they rely on their ability to do physical or manual work or on their ability to operate or repair machinery, about half as many (20%) say someone with less education than them could not learn how to do their job.

Many workers see a mismatch between their job and their qualifications

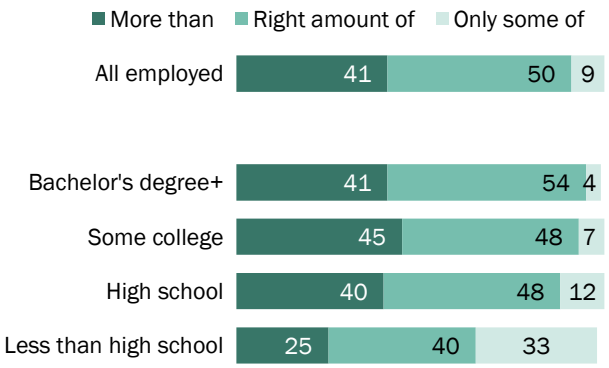
Half of all working adults say they have about the right qualifications for their job, but a significant minority (41%) say they have more qualifications than their job requires. Relatively few (9%) say they have only some of the qualifications needed to do their job.

These perceptions differ by educational attainment. Employed adults with a bachelor's degree or more education are among the most likely to say that they are well-suited for their job: 54% say they have the right amount of qualifications, 41% say they have more qualifications than are required, and 4% say they are underqualified for their current job.

Workers with some college education or a high school diploma are more evenly split over whether they have the right qualifications or more qualifications for their current job. Those who did not complete high school have a much different view. A quarter of these workers say they have more qualifications than their job requires, while fully a third say they have only some of the needed qualifications.

Roughly four-in-ten workers with a bachelor's degree say they are overqualified for their job

% of workers saying they have ____ the qualifications needed for their job



Note: Based on employed adults who have one job or those who have more than one job but consider one to be their primary job. "Some college" includes those with a two-year associate degree. "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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5. The value of a college education

An extensive body of research has argued that obtaining a college diploma is a good deal for graduates on almost any measure – from higher earnings to lower unemployment rates. By the same token, those without a college degree can find their upward mobility in the job market limited by a lack of educational credentials: This survey finds that one-third of Americans who lack a four-year college degree report that they have declined to apply for a job they felt they were qualified for, because that job required a bachelor's degree.

But despite the potential benefits and opportunities available to college graduates – and the potential challenges faced by those who lack a college diploma – Americans have somewhat mixed attitudes about the effectiveness of traditional four-year colleges and other higher education institutions. On a personal level, many college graduates describe their own educational experience as having a generally positive impact on their personal and professional development. Roughly six-in-ten (62%) college graduates with two- or four-year degrees think their degree was very useful for helping them grow personally and intellectually, while roughly half think it was very useful for opening up job opportunities (53%) or for providing them with useful job-related skills and knowledge (49%).

Yet even as many college graduates view their own educational experience in positive terms, the public as a whole – including a substantial share of college graduates – expresses reservations about the extent to which various higher education institutions to prepare students for the workforce more generally. Just 16% of Americans think that a four-year degree prepares students very well for a well-paying job in today's economy, and 51% say this type of degree prepares students "somewhat well" for the workplace. Some 12% think that a two-year associate degree prepares students very well (46% say somewhat well), and 26% feel that certification programs in a professional, technical, or vocational field prepare students very well (52% say somewhat well).

The purpose of college: Americans view workforce-relevant skills and knowledge as more important than personal and intellectual growth

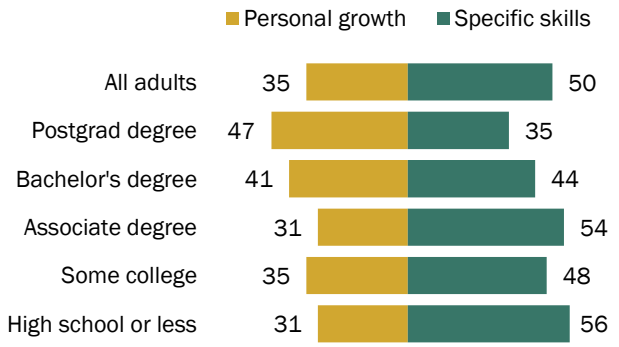
Americans' views of what a college education should be tend to prioritize specific, workplace-related skills and knowledge rather than general intellectual development and personal growth. Half of Americans say that the main purpose of college should be to teach specific skills and knowledge that can be used in the workplace, while 35% think its main purpose should be to help students grow and develop personally and intellectually and 13% volunteer that these objectives

are equally important. The public's views on this issue have shifted slightly in favor of skills development since the last time Pew Research Center asked this question in 2011. At that point, 47% said main purpose of college should be to teach specific skills and knowledge and 39% said it should be to promote personal and intellectual growth.

Americans who have engaged in additional schooling beyond a bachelor's degree are especially likely to say that the main purpose of college should be personal and intellectual growth, rather than the acquisition of specific skills and knowledge. Some 47% of those with a postgraduate or professional degree think the main purpose of college should be personal and intellectual growth, while 35% think it should be teaching workplace-relevant skills.

Those with postgraduate or professional degree more likely to see college as a place for personal growth

% saying the main purpose of college should be...



Note: "Some college" includes those who have attended college, but have not earned a degree. Volunteered responses of "Both equally" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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In contrast, those with limited college experience (or no college experience at all) are more likely to prioritize the development of specific skills over general intellectual improvement. For instance, 56% of Americans with a high school diploma or less say college should be primarily a place to develop specific work-oriented knowledge and skills, while just 31% see it primarily as a place for personal and intellectual growth.

There is also a partisan element to these views, with Republicans and Democrats expressing highly differing opinions on the purpose of college. Democrats (including Democratic-leaning independents) are about evenly split on which of these objectives is more important: 42% say colleges should prioritize personal and intellectual growth, while 43% say they should prioritize the development of workforce-relevant skills. But among Republicans and Republican leaners, 58% say that the main purpose of college should be teach specific skills – while just 28% feel that the main purpose should be general personal and intellectual growth.

These partisan differences hold true even after accounting for differences in educational attainment. Democrats and Democratic leaners with high levels of educational attainment are more likely to prioritize personal and intellectual growth relative to Democrats and Democratic leaners with lower levels of educational attainment.

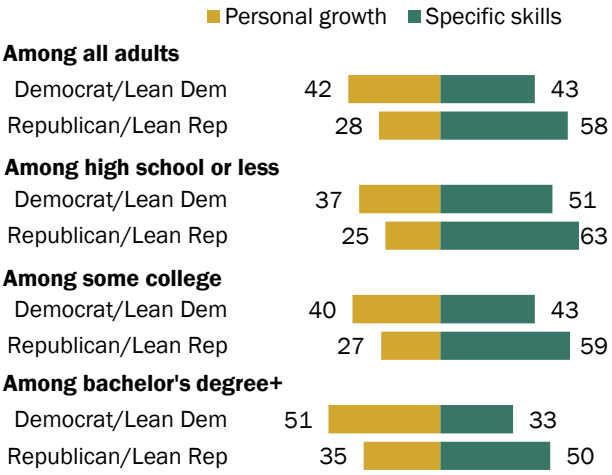
But Democrats and Democratic-leaning independents at all educational levels are more likely than Republicans and Republican-leaning independents with similar levels of education to believe that personal and intellectual growth should be the main purpose of college.

Along with Democrats and those who have progressed beyond a bachelor's degree, younger adults (those ages 18 to 29) are more likely than older adults to feel that personal and intellectual growth should be the primary purpose of college: some 43% of 18- to 29-year olds feel this way, compared with roughly one-third of those in older age groups.

In addition, Americans who themselves work in the education field tend to place a greater emphasis on personal and intellectual growth as the primary purpose of college: 46% believe that this should be the main purpose of a college degree, while 35% believe that college should mainly be a place to develop specific skills and knowledge (19% of those who work in the education industry consider them equally important).

Democrats at all education levels more likely to see college as a place for personal growth, rather than developing job skills

% saying the main purpose of college should be...



Note: "Some college" includes those with a two-year associate degree. Volunteered responses of "Both equally" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Most college graduates regard their college experience as very useful for intellectual growth; views are more mixed when it comes to job opportunities and marketable skills

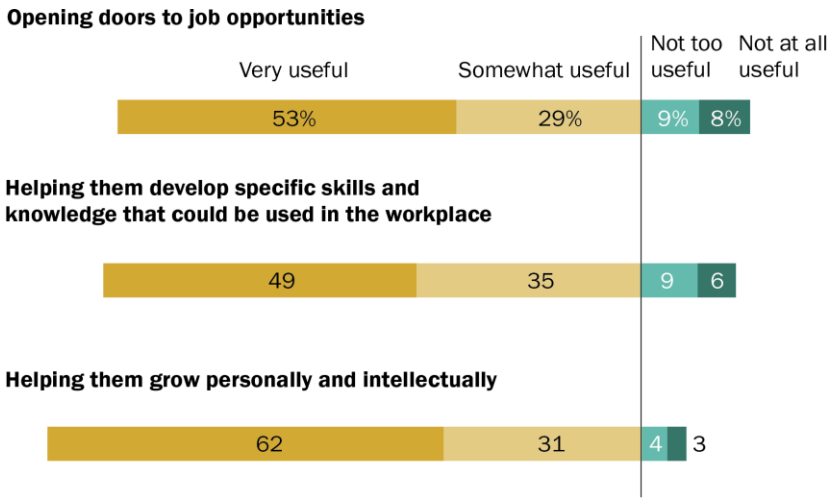
When asked to assess certain aspects of their own educational experience, about six-in-ten (62%) college graduates (including those who graduated from a two-year degree program) feel that their time in college was very useful in helping them grow personally and intellectually. About half say their college experience was very useful in helping them access job opportunities (53%) or in helping them develop skills and knowledge they could use in the workplace (49%).

The further people have progressed in their college career, the more likely they are to consider their experience very useful. Those with a postgraduate or professional degree are more likely to say that their college education was very useful in each of these respects compared with four-year degree holders, who are in turn more likely than those with a two-year associate degree to say that their education was very useful across each of these measures. For example, while two-thirds of those with a postgraduate or professional degree say their college education was very useful in opening doors to job opportunities, 56% of those with a four-year degree, and an even smaller share (40%) among those with a two-year degree, say the same. And while 57% of those with more than a bachelor's degree say college was very useful in helping them develop marketable skills, about half or a smaller share among those with a four- or two-year degree hold this view (49% and 43%, respectively).

When it comes to helping them grow professionally and intellectually, majorities of those with a postgraduate or professional degree (77%) and those with a bachelor's degree (64%) say college was very useful, compared with 46% of those with a two-year college degree.

Most two-year and four-year college graduates think their experience was broadly useful

% of adults with a two-year or four-year degree saying their education was _____ for ...



Note: "Don't know/Refused" responses not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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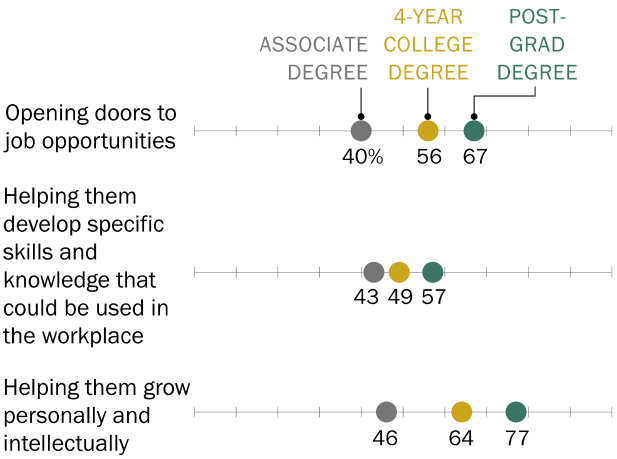
Those with an associate degree are less positive than others about the usefulness of their college experience

% saying their college experience was very useful for...



Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Americans have mixed views about the extent to which college prepares students for a well-paying job in today's economy

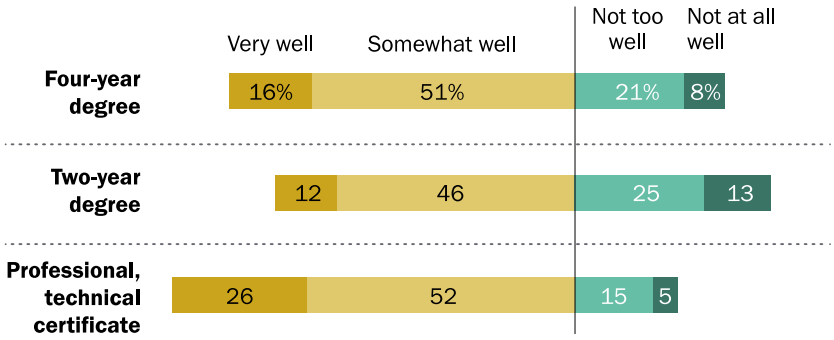
When asked a broader set of questions about the impact of college more generally, the public expresses somewhat mixed views about the extent to which a college education prepares students for success in the workforce.

Two-thirds of Americans (67%) think that a traditional four-year degree prepares students for a well-paying job in today's economy at least somewhat well, but just 16% think it prepares them *very* well, and 29% think it does not prepare them well. A somewhat smaller share of Americans (58%) think that a two-year community college degree prepares students for a well-paying job either very (12%) or somewhat (46%) well, while 38% think that these programs do not prepare students well.

Interestingly, Americans with a four-year college degree are generally no more positive – or negative – than those with less education about the relationship between a four-year degree and a well-paying job: 13% of those with a bachelor's degree or more education say a four-year degree prepares people very well, as do 11% of those with a two-year associate degree, 12% of those with some college experience but no degree, and 17% of those with a high school diploma. Among those who did not complete high school, however, 40% believe that a four-year college degree does a very good job of preparing people for a well-paying job.

Americans have mixed views about how well post-high school education prepares students for the workforce

In general, how well do you think a _____ prepares someone for a well-paying job in today's economy?



Note: "Four-year degree," "Two-year degree" and "Professional, technical certificate" were asked of different samples. Volunteered responses of "Depends on the person/job" and "Don't know/Refused" not shown.
Source: Survey of U.S. adults conducted May 25-June 29, 2016.
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When it comes to assessments of a two-year college degree, about one-in-six (16%) Americans who hold this type of degree say it prepares workers very well for a well-paying job. This is considerably larger than the share of those with at least a bachelor's degree (7%) who say a two-year degree

prepares people very well, but not necessarily more positive than the views of those with less education.

Blacks and Hispanics are more likely than whites to say four- and two-year degrees prepare people very well for a job in today's economy. For example, about three-in-ten (29%) Hispanics and about a quarter (24%) of blacks say this about a four-year degree, compared with 12% of whites. And while about one-in-five blacks and Hispanics (18% each) say a two-year associate degree prepares people very well, one-in-ten whites share this view.

These findings are consistent with previous Pew Research Center surveys that found that black and Latino parents view college as more essential for their children's success than do white parents.

A substantially larger share of the public has positive attitudes towards certification programs in a professional, technical or vocational field in the context of workforce development. Some 78% of Americans think that these programs prepare students well for a job in today's economy, including 26% who think they prepare students very well. Just roughly one-in-five (19%) think they do not prepare students well. It is important to note, however, that respondents were not asked about the effectiveness of certification programs *instead of* a college education.

Positive assessments of certificate programs as a way to prepare workers for jobs in today's economy are particularly widespread among those who did not complete high school; 44% in this group say these types of programs prepare people very well, compared with about a quarter (27%) of those with a high school diploma and a similar share of those with some college, but no degree (22%), a two-year degree (28%), or a

Minorities and those without a high school diploma see especially high value in a college education

% saying that a _____ prepares someone very well for a well-paying job in today's economy

	Four-year degree	Two-year degree	Certificate program
All adults	16%	12%	26%
Bachelor's degree+	13	7	22
Associate degree	11	16	28
Some college	12	11	22
High school	17	13	27
Less than high school	40	25	44
Whites	12	10	23
Blacks	24	18	25
Hispanics	29	18	39

Note: "Some college" includes those who have attended college, but have not earned a degree. Whites and blacks include only non-Hispanics. Hispanics are of any race. Cannot display data for Asians due to small sample size.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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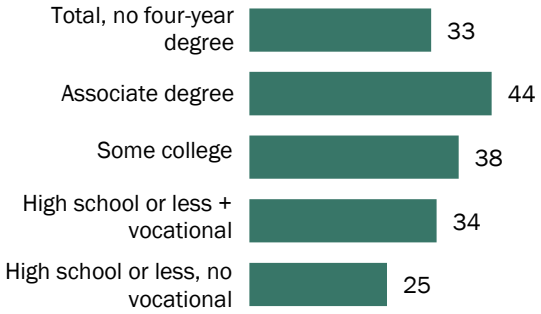
four-year degree or more education (22%). Certificate programs are also particularly well-regarded among Hispanics, 39% of whom say they prepare people very well for a good job in today's economy. About a quarter of blacks (25%) and whites (23%) say the same.

One-third of Americans without a bachelor's degree have elected to not apply for a job they felt they were qualified for because it required a four-year degree

Recent research has argued that there is a "credentials gap" in today's workforce, as employers increasingly require a bachelor's degree for positions that did not demand this level of schooling in the past. And the survey finds that 33% of Americans who do not have a four-year college degree report that they have declined to apply for a job they felt they were qualified for, because it required a bachelor's degree.

For those with formal education beyond high school, more education can mean more exposure to credentialing requirements

% saying they have not applied for a job they felt qualified for, because it required a bachelor's degree



Note: Based on adults without a four-year college degree. "Some college" includes those who have attended college, but have not earned a degree.
Source: Survey of U.S. adults conducted May 25-June 29, 2016. "The State of American Jobs"

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Americans who have engaged in some type of formal education beyond high school (short of obtaining a bachelor's degree) are particularly likely to believe they've been adversely affected by credentialing requirements as they work their way up the educational ladder. Some 25% of Americans with a high school diploma or less and no additional schooling beyond that have not applied for a job because of a bachelor's degree requirement. But that figure rises to 34% among those with a high school diploma plus additional vocational schooling, to 38% among those with some college experience but no degree, and to 44% among those with a two-year associate degree. Put somewhat differently, as people receive additional formal education without actually obtaining a bachelor's degree, they may develop relevant skills without the on-paper credentials to match.

In addition, adults younger than 50 are much more likely than older adults to have refrained from applying to a job they felt they were qualified for because they didn't meet the formal educational requirements. About four-in-ten non-college graduates ages 18 to 29 (41%) and ages 30 to 49

(44%) say this has happened, compared with 31% of those ages 50 to 64 and just 12% of those 65 and older.

Acknowledgments

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The Markle Foundation works to realize the potential of information technology to address some of the nation's most challenging issues in national security, health care and the economy. Markle's current initiative, Rework America, is focused on accelerating innovations that use the forces of technology and globalization to return opportunities to Americans in today's rapidly changing digital economy. For more information, visit markle.org and follow @MarkleFdn on Twitter.

This report is a collaborative effort based on the input and analysis of the following individuals. Find related reports online at pewresearch.org/socialtrends.

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Methodology

Survey methodology

Most of the analysis in this report is based on telephone interviews conducted May 25 to June 29, 2016, among a national sample of 5,006 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia (1,253 respondents were interviewed on a landline telephone, and 3,753 were interviewed on a cellphone, including 2,301 who had no landline telephone). The survey was conducted by interviewers at Princeton Data Source under the direction of Princeton Survey Research Associates International (PSRAI). Interviews were conducted in English and Spanish. For detailed information about our survey methodology, see http://www.pewresearch.org/methodology/u-s-survey-research/

A combination of landline and cell phone random digit dial (RDD) samples was used; both samples were provided by Survey Sampling International. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who was home at the time. Interviews in the cell sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older.

The combined landline and cell phone samples were weighted using an iterative technique that matches gender, age, education, race, Hispanic origin and nativity, and region to parameters from the Census Bureau's 2014 American Community Survey and population density to parameters from the 2010 decennial census. The sample also was weighted to match current patterns of telephone status (landline only, cell phone only, or both landline and cell phone), based on extrapolations from the July-December 2015 National Health Interview Survey. The weighting procedure also accounts for the fact that respondents with both landline and cell phones have a greater probability of being included in the combined sample and adjusts for household size among respondents with a landline phone.

The margins of error reported and statistical tests of significance are adjusted to account for the survey's design effect, a measure of how much efficiency is lost from the weighting procedures.

The following table shows the unweighted sample sizes and the error attributable to sampling that would be expected at the 95% level of confidence for different groups in the survey:

Group	Unweighted sample size	Plus or minus ...
Total sample	5,006	1.5 percentage points
Form 1	2,520	2.2 percentage points
Form 2	2,486	2.2 percentage points

A second telephone survey was conducted Sept. 1 to 4, 2016, as part of the PSRAI September 2016 Week 1 omnibus. This survey was conducted among a nationally representative sample of 1,004 adults ages 18 or older living in the continental United States (503 respondents were interviewed on a landline telephone, and 501 were interviewed on a cellphone, including 294 who had no landline telephone). Interviews were conducted in English and Spanish. The margin of sampling error for the weighted data is ± 3.8 percentage points.

Sample sizes and sampling errors for other subgroups are available upon request.

In addition to sampling error, one should bear in mind that question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of opinion polls.

Pew Research Center undertakes all polling activity, including calls to mobile telephone numbers, in compliance with the Telephone Consumer Protection Act and other applicable laws.

Coding of industries and occupations

Questions 20a and 20b in the main survey asked employed respondents what industry/field they work in and what kind of work they do (see topline for exact question wording and filters). These open-ended responses were coded using the net categories in the latest U.S. Census Bureau codes for industry and occupation, as reported by IPUMS.

Some industry and occupation codes were further collapsed into larger net categories as follows for analysis: The manufacturing and farming industry includes agriculture, farming, fishing, manufacturing, mining and construction. The trade industry includes retail and wholesale trade. The computer programming/IT industry includes software publishing, internet publishing and broadcasting, data processing and hosting, and computer systems design and related services. The hospitality/service industry includes arts, entertainment, social assistance, accommodation and food services, and all other personal services.

Manual/physical labor occupations include maintenance, installation, repair, production, machine operation, farming, fishing, forestry, construction and extraction. STEM/teaching occupations include computer programmers, coders, software developers, web developers, engineers, life, physical, and social science occupations, health care professionals, health care support occupations, teachers and instructors. Service occupations include food preparation and serving and personal care occupations.

Coding was conducted by PSRAI. The industry and occupation categories mentioned in the report are not exhaustive; only those with the largest shares of respondents are used in the analysis.

Analyses of secondary data

This section describes the data and methods used to measure the workplace trends presented in Chapter 1 of the report. A key aspect is the analysis of employment and wage trends in occupations grouped by job skills and preparation. That analysis is based on the combination of job skills and preparation data from the U.S. Department of Labor's Occupational Information Network (O*NET) and occupational employment and wage data from the Current Population Survey (CPS).[30] The CPS is also the data source for most of the other measures of workplace trends, such as health and retirement benefits, hours worked, job tenure, and self-employment.

Data sources

Occupational Information Network (O*NET): The O*NET database provides a variety of information related to the requirements of more than 950 occupations. Among other things, O*NET includes information on the specific skills required (mathematics, for example) by occupations, the more general abilities of workers in different occupations (such as stamina), the activities to be performed on the job (interacting with computers, etc.), and the job preparation required (a combination of education, experience and training.) A key piece of information is that each skill, ability or activity is rated on a scale of one to five measuring its importance to job performance, from not important to extremely important. Job preparation is also rated on a scale of one to five, from little or no preparation needed to extensive preparation needed. The ratings are based on ongoing surveys of a nationally representative sample of workers as well as occupation information generated by trained job analysts. This report used the most recent version of O*NET database available at the time (version 20.3, released April 2016). The ratings are mostly from within the past decade, reflecting the current level of importance of a skill to an occupation. Any change in these ratings over time is not observed in the current analysis. The

[30] Examples of related analyses of O*NET data may be found in Deming (2015) and Acemoglu and Autor (2010).

occupations included in O*NET are classified according to a coding scheme that is consistent with the 2010 Standard Occupational Classification.

Current Population Survey (CPS): Conducted jointly by the U.S. Census Bureau and the Bureau of Labor Statistics, the CPS is a monthly survey of approximately 55,000 households and is the source of the nation's official statistics on unemployment. In this report, 12 monthly CPS files in each year were combined to generate annual estimates of occupational employment in 1980, 1990, 2000, 2010 and 2015. Wages are estimated from the annual outgoing rotation group (ORG) files which consist of the sample of workers from whom wage information was collected. Additional analysis is based on the Annual Social and Economic Supplements (ASEC), conducted in March every year, and other relevant supplements to the CPS. Most of the CPS microdata files used in this report are the Integrated Public Use Microdata Series (IPUMS-CPS) provided by the University of Minnesota.[31]

Determining job skills and preparation

This report focuses on the changing demand for three major families of job skills – social, analytical and physical. In general terms, social skills include interpersonal skills, written and spoken communications skills, and management or leadership skills. Analytical skills pertain to facility with computers and mathematics, critical thinking and the like. Physical skills describe the ability to work with machinery or equipment, manipulate tools, and to do physical or manual labor.

*Job skills and preparation from O*NET data*

The table below lists the specific skills and work activities, from among the many listed in O*NET, chosen to represent the broader set of social, analytical and physical skills. Each major family of skills consists of sub-groups. Social skills refer to a combination of interpersonal skills, communication skills and managerial skills; analytical skills are a mix of critical thinking, evaluation and judgement skills, technical skills and basic computer skills; and physical skills are composed of mechanical skills and general physical skills. In turn, each sub-group consists of a handful of specific skills for which ratings are available in the O*NET data.

[31] Sarah Flood, Miriam King, Steven Ruggles, and J. Robert Warren. Integrated Public Use Microdata Series, Current Population Survey: Version 4.0. [Machine-readable database]. Minneapolis: University of Minnesota, 2015.

Detailed O*NET skill elements chosen to represent social, analytical and physical skills

Social Skills		Analytical Skills		Physical Skills	
Element Name	**Element ID**	**Element Name**	**Element ID**	**Element Name**	**Element ID**
Interpersonal skills		Critical thinking, evaluation and judgement skills		Mechanical skills	
Social perceptiveness	2.B.1.a	Critical thinking	2.A.2.a	Controlling machines and processes	4.A.3.a.3
Coordination	2.B.1.b	Active learning	2.A.2.b	Operating vehicles, mechanized devices, or equipment	4.A.3.a.4
Service orientation	2.B.1.f	Judgment and decision making	2.B.4.e	Repairing and maintaining mechanical equipment	4.A.3.b.4
Communication skills		Systems analysis	2.B.4.g	Repairing and maintaining electronic equipment	4.A.3.b.5
Reading comprehension	2.A.1.a	Systems evaluation	2.B.4.h	General physical skills	
Active listening	2.A.1.b	Technical skills		Performing general physical activities	4.A.3.a.1
Writing	2.A.1.c	Mathematics	2.A.1.e	Handling and moving objects	4.A.3.a.2
Speaking	2.A.1.d	Science	2.A.1.f		
Managerial skills		Complex problem solving	2.B.2.i		
Persuasion	2.B.1.c	Operations analysis	2.B.3.a		
Negotiation	2.B.1.d	Technology design	2.B.3.b		
Instructing	2.B.1.e	Programming	2.B.3.e		
Time management	2.B.5.a	Basic computer skills			
Management of financial resources	2.B.5.b	Interacting with computers	4.A.3.b.1		
Management of material resources	2.B.5.c				
Management of personnel resources	2.B.5.d				

Note: The O*NET elements listed above refer to worker skill requirements (those with an element ID starting with numeral 2) and work activities required across occupations (those with an element ID starting with numeral 4).
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As noted, the importance of each skill to an occupation is given a numerical rating on a scale of one to five in the O*NET data. For example, chief executives (occupation code 11-1011.00) have an O*NET rating of 4.25 for social perceptiveness (element ID 2.B.1.a), 4.25 for coordination (element ID 2.b.1.b) and 3.12 for service orientation (element ID 2.B.1.f). The average of these three scores – 3.87 – is taken as the measure of the importance of interpersonal skills for chief executives. Similarly, the importance of communication skills is measured by the average of the O*NET rating for reading comprehension, active listening, writing and speaking skills. For chief executives, the average score on communication skills is 4.16. Managerial skills are rated by the average score on persuasion, negotiation, instructing, time management, and management of

financial, material and personnel resources. The average score on managerial skills for chief executives is 3.94. Finally, the average of the scores for interpersonal, communication and managerial skills – 3.99 – is the overall social skill rating for chief executives.

The process described above is also used to develop the overall numerical rating for the importance of analytical skills and physical skills in each occupation. As the table shows, analytical skills are comprised of three sub-groups and physical skills are represented by two sub-groups. At the first stage, an average rating is estimated for each sub-group. Next, the average of the ratings for the sub-groups yields a measure of the overall importance of analytical and physical skills. For chief executives, the average importance of analytical skills is 3.70 and the average importance of physical skills is 1.34. The end result of this process is an average numerical rating for the importance of social, analytical and physical skills in each of the more than 950 occupations covered by O*NET.

The job preparation rating for an occupation is as directly recorded in O*NET in job zones. For example, chief executives have a numerical rating of five on job preparation ("extensive preparation needed.") This rating means that the occupation typically requires a graduate school level of education and extensive skill, knowledge and experience.

*Matching O*NET and CPS data*

Because O*NET does not contain employment or wage information for occupations it is necessary to match the skills data to CPS data. Although both O*NET and the CPS use the 2010 standard occupational classification there is one key difference: O*NET lists more than 950 occupations coded at the eight-digit level, the finest detail possible, whereas the CPS lists fewer than 500 occupations coded at the four-digit level. In other words, an occupation listed in the CPS typically encompasses more than one occupation listed in O*NET. Thus, occupational data in O*NET must be aggregated to match up to the CPS data. This was done in three steps, as detailed below:

Step 1: The job skills and preparation ratings for eight-digit occupations in O*NET were aggregated to the six-digit level. For example, financial managers, a six-digit occupation, are broken apart into two eight-digit occupations in O*NET: treasurers and controllers and financial managers, branch or department. The job skills and preparation ratings for these two eight-digit occupations in O*NET were averaged to estimate the ratings for financial managers. This process was repeated as necessary and the end result was a set of numerical ratings on job skills and preparation for 772 six-digit occupations.

Step 2: The ratings for six-digit occupations were further aggregated to the four-digit level using an occupational crosswalk from the Bureau of Labor Statistics. For example, marketing and sales managers, a four-digit occupation, consists of the following two six-digit occupations: marketing managers and sales managers. In this step of the aggregation process, the job skills and preparation ratings for marketing managers and sales managers are averaged using the employment in each occupation as the weight. The result of this process was average jobs skills and preparation ratings for some 480 four-digit occupations that could be matched to the CPS.

Step 3: Because occupational classifications are frequently revised, an additional step was necessary to match the job skills and preparation ratings to a harmonized occupation coding scheme that could be used to trace employment and wage trends going back in time. This was done using the scheme available in the IPUMS-CPS data (OCC2010) that provides a consistent, long-term classification of occupations based on the 2010 standard occupational classification. Because of some inconsistencies between the latest CPS occupational codes and the harmonized occupation coding in OCC2010, additional aggregation and recoding was needed to maximize the number of occupations with valid skill ratings. For example, job skills and preparation ratings for advertising and promotions managers, marketing and sales managers, and public relations managers – three distinct four-digit occupations in the current CPS – were averaged using employment weights to estimate the ratings for managers in marketing, advertising, and public relations – a single occupation in the time-consistent OCC2010 classification. The final dataset with job skills and preparation data from O*NET includes 431 occupations, of which employment and wage data from the CPS were available for 430 occupations.

Sorting occupations by skill level and job preparation

Simple averages of the ratings for social, analytical and physical skills for the 431 occupations for which skills and preparation data could be tabulated are used to divide occupations into two groups, those with average to above average skill ratings and those with below average ratings.

In 2015, the average ratings across all occupations are estimated to be 2.96 for social skills, 2.79 for analytical skills, and 2.66 for physical skills. Occupations with a social-skills rating of 2.96 or higher (average to above average) are classified as requiring higher levels of social skills. Examples of such occupations are chief executives and registered nurses. Of the 430 occupations for which employment and wage data are also available, 206 were determined to require average to above average levels of social skills. Similarly, occupations with an analytical-skills rating of 2.79 or higher are classified as requiring higher levels of analytical skills. Numbering 228, this group includes occupations such as tax preparers. Occupations with a physical-skills rating of 2.66 or

higher are classified as requiring higher levels of physical skills. There are 218 such occupations, such as welding, soldering and brazing workers.

It should be noted that an occupation may require higher levels of more than one type of skill. For example, being a chief executive requires both higher social and higher analytical skills. Among the 206 occupations requiring relatively higher levels of social skills, 180 also require higher levels of analytical skills. A table available for download provides a complete list of occupations showing whether or not they require higher levels of any of the three skills.

With respect to job preparation, the average rating across all occupations in 2015 is estimated to be 2.88. Jobs requiring this average level of preparation typically call for an associate's degree or a similar level of vocational training, plus some prior job experience and one or two years of either formal or informal on-the-job training (e.g., electricians). Occupations with a job preparation rating of 2.88 or higher are classified as requiring higher levels of job preparation.

Hourly wages

Estimates of hourly wages encompass all workers from whom wage data were collected in the CPS, whether or not the workers were paid on an hourly basis. For workers who are not paid by the hour, the hourly wage is calculated as weekly earnings divided by the usual numbers of hours worked in a week. Wage estimates pertain to a worker's main job. The CPS collects data on wages from outgoing rotation groups only, which represent one-quarter of the monthly sample. Self-employed workers are excluded from this sub-sample. Wages are adjusted for inflation with the Consumer Price Index Research Series (CPI-U-RS).