

TABLE 95

Impact of artificial intelligence technology on skill level of workforce, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Number of workers			Skill level of workers			STEM skills of workers			
			Increased	Decreased	Did not change	Increased	Decreased	Did not change	Increased	Decreased	Did not change	Did not employ
All industries	11, 21–23, 31–33, 42–81	141,159	15.0	6.3	78.7	41.0	1.8	57.2	31.2	1.1	39.8	27.9
Manufacturing industries	31–33	6,327	12.7	10.0	77.3	41.7	2.4	55.9	35.8	2.1	42.5	19.7
Food	311	323	21.3	r 21.5	57.2	32.8	D	66.3	30.0	D	54.5	14.6
Beverage and tobacco products	312	120	28.3		65.9	46.7	D	50.8	30.3	0.0	43.7	26.0
Textile, apparel, and leather products	313–16	156	10.9	r 5.1	r 84.0	64.1	D	35.3	31.4	r D	19.9	r 48.7
Wood products	321	191	6.3	r 4.7	r 89.0	32.3	r 0.0	67.7	10.5	0.0	50.8	38.7
Paper	322	18	D	D	94.4	38.9	D	61.1	22.2	0.0	77.8	D
Printing and related support activities	323	385	8.1	7.5	84.5	19.7	0.0	80.3	10.9	0.0	31.8	57.3
Petroleum and coal products	324	4	D	0.0	D	D	0.0	D	D	0.0	D	0.0
Chemicals	325	262	24.4	6.1	r 69.5	40.2	5.0	r 54.9	40.5	D	47.7	11.1
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pharmaceuticals and medicines	3254	40	7.5	D	85.0	20.0	r 0.0	80.0	32.5	r 0.0	62.5	D
Soap, cleaning compound, and toilet preparation manufacturing	3256	48	16.7	r D	62.5	25.0	D	58.3	20.8	r 0.0	41.7	r 37.5
Other chemicals	other 325	174	28.7	3.4	67.9	49.4	D	49.4	46.6	D	46.6	6.9
Plastics and rubber products	326	236	15.1	r 5.8	79.1	45.3	D	54.7	54.2	D	34.7	8.1
Nonmetallic mineral products	327	131	11.6	r 8.5	r 80.0	30.5	r D	65.6	20.8	0.0	59.3	20.0
Primary metals	331	50	12.2	0.0	87.8	46.9	r 0.0	53.1	32.0	r 0.0	48.0	20.0
Fabricated metal products	332	1,517	6.5	14.3	r 79.2	46.4	3.2	r 50.4	34.6	2.6	r 44.1	18.7
Machinery	333	887	15.3	3.3	81.4	43.3	D	55.5	54.8	D	36.0	8.3
Computer and electronic products	334	442	22.1	5.7	r 72.2	42.1	D	57.5	38.4	2.0	r 52.4	7.2
Communications equipment	3342	55	D	D	63.6	53.7	0.0	46.3	r 43.6	r 0.0	47.3	r 9.1
Semiconductor and other electronic components	3344	111	9.0	r D	87.4	29.1	0.0	70.9	25.2	D	64.0	8.1
Navigational, measuring, electromedical, and control instruments	3345	194	31.4	D	66.5	36.6	D	62.4	41.2	D	55.7	D
Other computer and electronic products	other 334	83	21.7	r D	75.9	65.5	0.0	34.5	r 47.0	D	34.9	r 16.9
Electrical equipment, appliances, and components	335	212	13.7	r 5.2	r 81.1	40.6	r D	58.0	64.5	0.0	27.6	r 7.9
Transportation equipment	336	349	11.7	r 2.3	86.0	35.2	D	63.3	28.9	r 0.0	39.6	r 31.5
Automobiles, bodies, trailers, and parts	3361–63	293	10.6	r D	89.1	33.1	D	66.9	26.5	r 0.0	39.1	r 34.4
Aerospace products and parts	3364	35	20.0	D	68.6	58.3	r 0.0	41.7	r 52.9	r 0.0	38.2	r 8.9
Other transportation	other 336	19	D	D	78.9	31.6	r D	52.6	19.1	r 0.0	47.6	r 33.3
Furniture and related products	337	382	14.7	36.4	49.0	55.8	D	29.6	44.2	D	35.1	7.6

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Miscellaneous	339	666	9.5	6.5	84.1	39.2	D	60.2	22.7	D	50.5	24.5	
Medical equipment and supplies	3391	284	10.2	12.3	r 77.6	55.3	D	43.3	25.0	D	29.6	39.8	
Other miscellaneous manufacturing	3399	383	8.9	D	88.8	27.0	0.0	73.0	21.0	0.0	65.9	13.1	r
Nonmanufacturing industries	11, 21–23, 42–81	134,833	15.1	6.1	78.8	40.9	1.8	57.3	31.0	1.0	39.7	28.3	
Agriculture, forestry, fishing, and hunting	11	300	r D	D	69.3	0.0	0.0	100.0	0.0	0.0	49.0	r 51.0	r
Mining, extraction, and support activities	21	258	D	5.8	r 73.3	49.0	0.0	51.0	52.3	0.0	38.8	8.9	r
Utilities	22	65	11.0	r 0.0	89.0	23.5	r 0.0	76.5	17.2	r 0.0	67.2	r 15.6	r
Construction	23	10,274	21.1	6.2	72.7	45.2	D	54.3	32.5	0.0	41.3	26.2	
Wholesale trade	42	5,293	12.5	8.7	78.8	40.5	2.8	56.7	32.0	D	38.7	28.4	
Retail trade	44–45	13,168	13.7	7.8	78.5	39.2	3.1	57.7	22.3	2.3	45.4	30.0	
Transportation and warehousing	48–49	3,527	16.9	9.0	74.1	36.5	2.0	r 61.5	24.3	D	37.8	37.6	
Information	51	4,039	19.7	5.9	74.4	41.9	0.2	r 57.9	44.2	0.2	r 40.6	14.9	
Publishing	511	1,331	21.6	4.3	r 74.0	38.5	D	60.9	39.7	D	45.3	14.4	
Newspaper, periodical, book, and directory publishers	5111	361	11.1	r 11.1	r 77.9	34.6	D	64.5	27.4	D	47.9	23.3	
Software publishers	5112	970	25.7	1.5	r 72.8	40.0	D	59.5	44.2	D	44.2	11.0	r
Telecommunications	517	275	19.3	D	80.7	28.4	0.0	71.6	24.9	0.0	51.7	23.5	
Data processing, hosting, and related services	518	1,168	26.5	10.1	r 63.4	54.9	0.0	45.1	57.8	0.0	32.8	9.4	
Other information	other 51	1,263	11.4	4.8	83.8	36.5	D	63.3	40.7	D	40.6	18.8	
Finance and insurance	52	8,784	12.4	8.4	79.2	46.8	1.6	r 51.6	35.3	D	38.4	26.3	
Real estate and rental and leasing	53	8,541	9.0	3.0	88.0	28.8	1.5	r 69.7	21.1	D	37.2	40.7	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other real estate and rental and leasing	other 53	8,541	9.0	3.0	88.0	28.8	1.5	r 69.7	21.1	D	37.2	40.7	
Professional, scientific, and technical services	54	38,008	15.4	3.6	81.0	43.5	0.4	56.1	39.2	0.2	r 37.7	22.9	
Legal services	5411	5,965	9.4	5.9	84.7	30.2	D	69.7	16.4	0.0	36.2	47.5	
Accounting, tax preparation, bookkeeping, and payroll services	5412	4,980	10.1	6.0	83.9	35.4	1.5	r 63.1	33.3	D	38.9	27.0	
Architectural, engineering, and related services	5413	3,046	20.5	3.4	76.1	48.7	0.3	r 51.0	45.8	D	43.3	10.6	
Specialized design services	5414	1,174	D	D	99.6	31.0	0.0	69.0	19.7	0.0	43.0	37.4	
Computer systems design and related services	5415	11,681	18.7	3.0	78.3	51.9	0.2	r 47.9	52.9	0.3	r 36.8	10.0	
Management, scientific, and technical consulting services	5416	6,676	17.9	1.6	r 80.5	44.8	D	55.1	42.9	D	34.3	22.8	
Scientific research and development services	5417	861	30.8	3.4	65.8	49.9	1.2	r 48.9	56.0	D	36.7	7.0	
Advertising, public relations, and related services	5418	1,365	17.2	2.3	80.5	48.4	1.2	50.4	30.2	D	37.2	32.5	
Other professional, scientific, and technical services	5419	2,263	12.5	3.7	r 83.8	43.3	0.0	56.7	30.1	0.0	44.9	25.0	

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Management of companies and enterprises	55	91	r	D	0.0	41.8	r	D	0.0	D	D	0.0	41.8	r	0.0			
Administrative and support and waste management and remediation services	56	7,687				18.3		6.5	75.2	43.4	1.7	r	54.9	27.2	D	38.9	33.3	
Educational services	61	1,564				9.6		11.1	79.3	42.8	D		54.4	20.9		0.0	42.6	36.6
Health care and social assistance	62	16,796				13.7		4.1	82.2	37.8	2.0		60.2	30.9	1.0	r	41.5	26.7
Health care services	621–23	15,746				13.5		4.1	82.4	38.2	1.8		60.0	30.8	0.8	r	42.1	26.4
Social assistance	624	1,051				15.9		D	79.8	31.4	D		64.3	31.4	D		33.1	31.3
Arts, entertainment, and recreation	71	1,442		r	6.4	r	81.2		30.7		6.6	r	62.7	15.0	D		50.0	31.7
Accommodation and food services	72	8,936				17.7		12.6	69.7	43.2	7.2		49.6	24.0	6.5		31.5	37.9
Other services	81	6,055				14.4		9.0	76.6	37.6	D		61.1	20.1	D		47.6	31.6

D = withheld to avoid disclosing data for individual companies; data are included in higher-level totals. r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System; STEM = science, technology, engineering, and mathematics.

Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2019 Annual Business Survey: Data Year 2018.