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Enhancing Veterans' Access to STEM Education and Careers: A Labor Market Analysis of Veterans in the STEM Workforce - Infographic

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INSTITUTE FOR VETERANS AND MILITARY FAMILIES
Syracuse University JPMorgan Chase & Co., Founding Partner

EMPLOYMENT RESEARCH

ENHANCING VETERANS' ACCESS TO STEM EDUCATION AND CAREERS:

A Labor Market Analysis of Veterans in the STEM Workforce

Rosalinda Maury, M.S. ■ Brice Stone, Ph.D. ■ Nicholas Armstrong, Ph.D.

EMPLOYMENT RESEARCH
VETERANS IN THE STEM WORKFORCE BRIEF | DECEMBER 2018

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ABOUT THE INSTITUTE FOR VETERANS AND MILITARY FAMILIES AT SYRACUSE UNIVERSITY (IVMF)

The Institute for Veterans and Military Families (IVMF) is the first interdisciplinary national institute in higher education focused on the social, economic, education, and policy issues impacting veterans and their families. Through its professional staff and experts, the IVMF delivers leading programs in career, vocational, and entrepreneurship education and training, while also conducting actionable research, policy analysis, and program evaluations. The IVMF also supports communities through collective impact efforts that enhance delivery and access to services and care. The Institute, supported by a distinguished advisory board, along with public and private partners, is committed to advancing the lives of those who have served in America's armed forces and their families. For more information, visit **ivmf.syracuse.edu.**

ABOUT THE AUTHORS

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Rosalinda Maury is the Director of Applied Research and Analytics at IVMF at Syracuse University. She has worked on numerous projects, including the effects of personal financial mismanagement behaviors, training needs assessment, workload assessment, job and occupational analysis, equal pay for equal work, job compatibility assessment, and factors effecting military spouse and veteran employment. She has extensive experience in survey development and worldwide data collection, and has been responsible for developing, implementing and managing surveys for data collection on the large and small scale, for organizations and government sectors. Her work has been featured in numerous publications and she has presented at various professional conferences. Maury received her Master of Science in Psychology from the University of Texas at San Antonio.

BRICE STONE, PH.D.

Brice M. Stone has a Ph.D. in Economics from Texas A&M University, awarded in 1978 with areas of emphasis in Industrial Organization and Econometrics. Dr. Stone has over 35 years of experience as a behavioral scientist, labor economist, and statistical analyst. He has been an economic consultant and principal investigator with a significant degree of experience in assessing and modeling human behavior across agencies such as the Department of Defense, Department of State, Defense Manpower Data Center, IVMF (Institute for Veteran and Military Families at Syracuse University), Department of Justice, and Department of Health and Human Services. His has performed research in both the private and Government sectors. He has performed research for branches of the U.S. armed forces to develop behavioral models for the prediction of accession and retention of enlisted and officer personnel.

NICHOLAS ARMSTRONG, PH.D.

Nick Armstrong is the Senior Director for Research and Evaluation at the IVMF at Syracuse University where he leads IVMF's growing portfolio of applied research, program evaluation efforts, and data analytics. Armstrong is also an affiliated adjunct public management faculty member in the Department of Public Administration and International Affairs at Syracuse University's Maxwell School. Before joining the IVMF, Armstrong served for six years as a research fellow at Syracuse University's Institute for National Security and Counterterrorism (INSCT) where he led government and privately sponsored projects on various security topics including security sector reform, wartime contracting, post conflict reconstruction, and community resilience. Armstrong is also an eight-year veteran of the U.S. Army and served in Iraq, Afghanistan, and Bosnia as a Ranger qualified artilleryman. Armstrong is a graduate of the U.S. Military Academy at West Point (B.S.) and the Maxwell School of Citizenship and Public Affairs at Syracuse University (Ph.D., M.P.A.).

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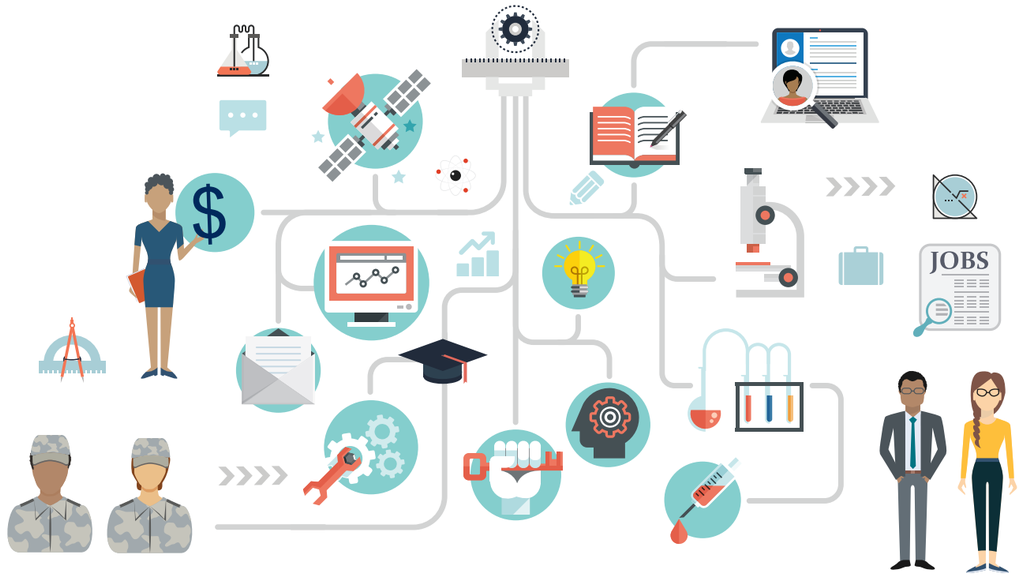


OVERVIEW

The nation's future and economic competitiveness hinge, more than ever, on our ability to develop, grow, and sustain a workforce proficient in science, technology, engineering and math (STEM). In the last decade alone, jobs requiring some level of STEM expertise have grown 34 percent—to include jobs that do not require a bachelor's degree.[1] At the same time, veterans and transitioning service members represent a valuable, skilled talent pool from which to help meet this critical need.

To this broader purpose, the Institute for Veterans and Military Families (IVMF) recently provided research support to the Council for Adult and Experiential Learning (CAEL), in collaboration with the Helmsley Charitable Trust, in an effort to inform the development of local and regional STEM ecosystems of educators and employers aimed increasing veterans' access to STEM careers. Specifically, the project intended to better equip local postsecondary institutions and employers with the collaborative tools and information needed to successfully align education, training, and employer needs in STEM, alongside efforts to recruit and retain veterans into local employment opportunities.

This research brief presents key highlights on recent veteran participation in the STEM workforce drawing upon an analysis of the American Community Survey (2012-2016), led by the U.S. Census Bureau. From this data, the research team examined veteran participation across 49 distinct STEM occupations, which are grouped into the following five occupational clusters: Engineering, Information Technology and Computer Science, Life and Physical Sciences, Mathematics, and Supervisor/ Management of STEM occupations. Among other analyses, the research team identified year-over-year trends in veteran participation, geographic distribution, and comparisons to non-veterans across all STEM occupations.

[1] National Science Board. (2018). "Our Nation's Future Competitiveness Relies on Building a STEM-capable U.S. Workforce." Washington, DC: National Science Foundation. Retrieved from https://www.nsf.gov/nsb/sei/companion-brief/NSB-2018-7.pdf

MAIN DATA SOURCE: 2012-2016 American Community Survey 5-Year Estimates:

Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek. IPUMS USA: Version 8.0 [2012-2016 American Community Survey]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D010.V8.0

OTHER DATA SOURCES USED IN HIGHLIGHTS SELECTED STATES SECTION:

U.S. Department of Veterans Affairs.(2007) Veteran Population Projections Model (VetPop 2007), Table 2S. Office of the Actuary.

U.S. Department of Veterans Affairs. (n.d.) GI Bill Comparison Tool. U.S. Department of Veterans Affairs, accessed November 1, 2018, http://department-ofveterans-affairs.github.io/gi-bill-comparison-tool/

ANALYSIS OF VETERANS IN THE STEM WORKFORCE

Overall Participation in STEM fields

The majority of those in the labor force are not in STEM occupations (6% compared to 94%).

VETERANSS REPRESENT A LARGER PROPORTION IN STEM OCCUPATIONS COMPARED TO NONVETERANS

8% of veterans in STEM compared 6% of nonveterans

Veteran Participation in STEM fields:

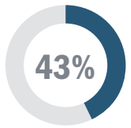
Veterans are **1.47X MORE LIKELY** to be in a STEM occupation compared to nonveterans.

Trends

Between 2012 and 2016, veterans entered into STEM occupations at an

INCREASING ANNUAL RATE OF 0.23% POINT

Top STEM Clusters for Veterans



Information Technology & Computer

Engineering Stem

STEM Occupations with Growing Veteran Participation:

49 TOTAL STEM OCCUPATIONS

NEARLY HALF

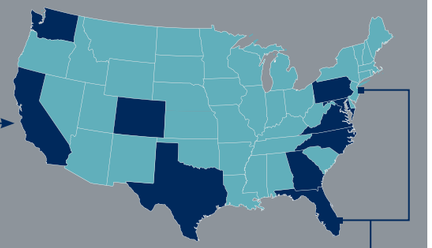
(19) exhibited a positive trend of increased veteran participation from 2012 to 2016.

Information Security Analysts EXHIBIT THE HIGHEST ODDS RATIO

- The Information Security Analysts have a positive yearly increase of 0.17% points/year
- Veterans are **2.64X MORE LIKELY** to be Information Security Analysts compared to nonveterans

TOP STEM STATES:

CALIFORNIA ACCOUNTS FOR THE MOST VETERANS in the STEM workforce from 2012 to 2014 (10%), followed by Texas (9%), Virginia (8%), Florida (7%), Maryland (4%), North Carolina (4%), Georgia (3%), Washington (3%), Colorado (3%), and Pennsylvania (3%)



The South Atlantic region (District of Columbia, Delaware, West Virginia, South Carolina, Maryland, Virginia, Georgia, North Carolina, and Florida) exhibited **THE LARGEST CONCENTRATION** of veterans in the STEM workforce.

TOP 10 STEM METROPOLITAN AREAS:

- Washington-Arlington-Alexandria, DC-VA-MD (9%)
- Dallas-Fort Worth-Arlington, TX (4%)
- Los Angeles-Long Beach-Anaheim, CA (3%)
- New York-Newark-Jersey City, NY-NJ-PA (3%)
- Atlanta-Sandy Springs-Roswell, GA (3%)
- Vineland-Bridgeton, NJ (2%)
- Phoenix-Mesa-Scottsdale, AZ (2%)
- Baltimore-Columbia-Towson, MD (2%)
- San Diego-Carlsbad, CA (2%)
- Seattle-Tacoma-Bellevue, WA (2%)

These results provide insight into how veterans are doing in the U.S. STEM workforce. They also reveal opportunities for the development of high-potential STEM education and career pipelines for veterans and transitioning service members. Of course, the overall success of this STEM pipeline would be dependent upon the capacity for local networks to identify high growth STEM occupations that connect to military transferable skills as well as the degree of collaboration between postsecondary institutions and employers in leveraging these skills in diverse career pathways.

Veteran Earnings in STEM Careers:

Veterans in STEM occupations **EARN 8% MORE** than their nonveteran peers

Average earnings of veteran in STEM occupation ($93, 833) compared to average earnings of nonveteran in STEM occupation ($86,676).

Veterans in STEM occupations also **TEND TO OUT-EARN,** at even higher rates, both their veteran and non-veteran counterparts in **NON-STEM FIELDS.**

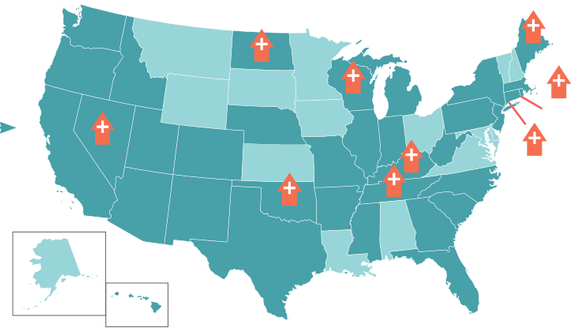
Veteran Unemployment in STEM fields:

VETERANS IN STEM FIELDS TEND TO EXPERIENCE LOWER OVERALL UNEMPLOYMENT

than those in other occupations, although unemployment was slightly higher for veterans in stem compared to nonveterans in STEM

Top States for STEM Earnings Growth:

36 OF THE 51 STATES (including District of Columbia) exhibited positive trends in the average total annual personal income for veteran STEM workers (in nominal dollars) from 2012 to 2016.



STATES WITH HIGHEST POSITIVE GROWTH
Connecticut, Maine, Nevada, North Dakota, Oklahoma, Rhode Island, South Carolina, Tennessee, West Virginia and Wisconsin.

STEM OCCUPATION HIGHLIGHTS

TOP STEM OCCUPATIONS

THE TOP STEM OCCUPATIONS FOR VETERANS ARE:

1. Software Developers & Programmers (13%)
2. Computer Support Specialists (7%)
3. Computer & Information Systems Managers (7%)
4. Engineers (6%)
5. Computer Systems Analysts (6%)

LARGEST STEM GROWTH

THE STEM OCCUPATIONS WITH THE LARGEST POSITIVE YEARLY INCREASE FOR VETERANS ARE:

1. Computer Occupations (↑0.85% point/year)
2. Computer Support Specialists (↑0.19% point/year)
3. Software Developers & Programmers (↑0.18% point/year)
4. Information Security Analysts (↑0.17% point/year)
5. Computer & Information Systems Managers (↑0.13% point/year)

LARGEST STEM LIKELIHOOD

VETERANS ARE MORE LIKELY THAN NONVETERANS TO BE IN:

- Information Security Analysts (2.6X MORE LIKELY)
- Engineering Technicians, Except Drafters (2.1X MORE LIKELY)
- Atmospheric and Space Scientists (2.0X MORE LIKELY)
- Marine Engineers and Naval Architects (1.9X MORE LIKELY)
- Computer Network Architects (1.8X MORE LIKELY)
- Operations Research Analysts (1.8X MORE LIKELY)
- Network & Computer Systems Administrators (1.7X MORE LIKELY)

SELECTED STATE HIGHLIGHTS

LARGEST STEM GROWTH FOR VETERANS ARE IN:

- TEXAS (↑0.25% point/year)
- FLORIDA (↑0.22% point/year)
- TENNESSEE (↑0.13% point/year)
- WASHINGTON (↑0.09% point/year)
- NEVADA (↑0.07% point/year)

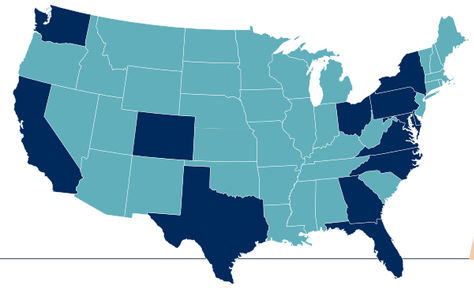
LARGEST STEM LIKELIHOODS FOR VETERANS BY STATE

Veterans are more likely to be in the STEM workforce compared to nonveterans in these areas:

- VIRGINIA (2.2X MORE LIKELY)
- HAWAII (1.9X MORE LIKELY)
- NEVADA (1.9X MORE LIKELY)
- ALABAMA (1.7X MORE LIKELY)
- ALASKA (1.6X MORE LIKELY)
- SOUTH CAROLINA (1.6X MORE LIKELY)
- OKLAHOMA (1.6X MORE LIKELY)
- NEBRASKA (1.6X MORE LIKELY)
- MISSISSIPPI (1.5X MORE LIKELY)
- NEW MEXICO (1.5X MORE LIKELY)

ANALYSIS OF VETERANS IN THE STEM WORKFORCE

HIGHLIGHTS
Selected States



California

Rank #1 of veterans in workforce by state.
Includes 10% of veterans in the STEM workforce.

VETERAN POPULATION → 1,720,635

101,000
Estimated number of separations over the next 5 years

96,361
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Los Angeles-Long Beach-Anaheim, CA (24%)
- San Diego-Carlsbad, CA (18%)
- San Francisco-Oakland-Hayward, CA (11%)
- Riverside-San Bernardino-Ontario, CA (10%)
- Sacramento-Roseville-Arden-Arcade, CA (8%)

Colorado

Rank #9 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 383,699

18,662
Estimated number of separations over the next 5 years

29,828
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Denver-Aurora-Lakewood, CO (51%)
- Colorado Springs, CO (28%)
- Not in identifiable area – Rural (14%)
- Fort Collins, CO (6%)

Florida

Rank #4 of veterans in workforce by state.
Includes 7% of veterans in the STEM workforce.

VETERAN POPULATION → 1,480,133

67,000
Estimated number of separations over the next 5 years

69,758
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Miami-Fort Lauderdale-West Palm Beach, FL (26%)
- Tampa-St. Petersburg-Clearwater, FL (21%)
- Miami-Fort Lauderdale-West Palm Beach, FL (15%)
- Not in identifiable area – Rural (14%)
- Jacksonville, FL (11%)
- Orlando-Kissimmee-Sanford, FL (10%)
- Palm Bay-Melbourne-Titusville, FL (8%)
- Pensacola-Ferry Pass-Brent, FL (4%)

Georgia

Rank #7 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 662,333

39,000
Estimated number of separations over the next 5 years

31,734
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Atlanta-Sandy Springs-Roswell, GA (59%)
- Not in identifiable area – Rural (33%)
- Augusta-Richmond County, GA-SC (5%)

Maryland

Rank #5 of veterans in workforce by state.
Includes 4% of veterans in the STEM workforce.

VETERAN POPULATION → 392,771

29,000
Estimated number of separations over the next 5 years

30,382
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Washington-Arlington-Alexandria, DC-VA-MD (43%)
- Baltimore-Columbia-Towson, MD (42%)
- Not in identifiable area – Rural (12%)

New York

Rank #12 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 789,553

37,000
Estimated number of separations over the next 5 years

31,429
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- New York-Newark-Jersey City, NY-NJ-PA (37%)
- Not in identifiable area – Rural (19%)
- Rochester, NY (11%)
- Albany-Schenectady-Troy, NY (9%)
- Buffalo-Cheektowaga-Niagara Falls, NY (8%)
- Syracuse, NY (7%)

North Carolina

Rank #6 of veterans in workforce by state.
Includes 4% of veterans in the STEM workforce.

VETERAN POPULATION → 683,221

39,000
Estimated number of separations over the next 5 years

34,920
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Not in identifiable area – Rural (30%)
- Raleigh, NC (20%)
- Charlotte-Concord-Gastonia, NC (19%)
- Greensboro-High Point, NC (6%)
- Winston-Salem, NC (6%)

Ohio

Rank #11 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 779,187

37,978
Estimated number of separations over the next 5 years

21,812
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Not in identifiable area – Rural (19%)
- Columbus, OH (18%)
- Cleveland-Elyria, OH (16%)
- Dayton, OH (15%)
- Cincinnati, OH-KY-IN (13%)
- Akron, OH (6%)

Pennsylvania

Rank #10 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 840,258

37,000
Estimated number of separations over the next 5 years

24,445
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Philadelphia-Camden-Wilmington, PA-NJ-DE (25%)
- Not in identifiable area – Rural (21%)
- Pittsburgh, PA (20%)
- Harrisburg-Carlisle, PA (7%)

Texas

Rank #2 of veterans in workforce by state.
Includes 9% of veterans in the STEM workforce.

VETERAN POPULATION → 1,513,294

90,000
Estimated number of separations over the next 5 years

97,926
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Dallas-Fort Worth-Arlington, TX (34%)
- Dallas-Fort Worth-Arlington, TX (32%)
- Houston-The Woodlands-Sugar Land, TX (19%)
- San Antonio-New Braunfels, TX (15%)
- Not in identifiable area – Rural (13%)
- Austin-Round Rock, TX (11%)

Virginia

Rank #3 of veterans in workforce by state. Includes 8% of veterans in the STEM workforce.

VETERAN POPULATION → 696,685

51,000
Estimated number of separations over the next 5 years

53,512
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Washington-Arlington-Alexandria, VA (61%)
- Virginia Beach-Norfolk-Newport News, VA (24%)
- Not in identifiable area – Rural (7%)
- Richmond, VA (6%)

Washington

Rank #8 of veterans in workforce by state.
Includes 3% of veterans in the STEM workforce.

VETERAN POPULATION → 552,863

29,000
Estimated number of separations over the next 5 years

24,617
Total GI Bill students in 2017

LARGEST % OF STEM VETERAN EMPLOYMENT BY METROPOLITAN AREA WITHIN THE STATE:

- Seattle-Tacoma-Bellevue, WA (54%)
- Not in identifiable area – Rural (17%)
- Bremerton-Silverdale, WA (10%)
- Spokane-Spokane Valley, WA (7%)

ANALYSIS OF VETERANS IN THE STEM WORKFORCE

STAY IN TOUCH

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