



National Center for Science and
Engineering Statistics

InfoBrief

New Pilot Data on the Prevalence of Work-Related Credentials among STEM Workers from the National Training, Education, and Workforce Survey

NSF 25-352 | September 10, 2025

In 2022, there were about 153 million employed workers, and approximately 23% of those employed worked in a STEM (science, technology, engineering, or mathematics) occupation¹ according to the National Training, Education, and Workforce Survey (NTEWS) Pilot.² Among the 36 million individuals working in STEM occupations, 51% reported a sub-baccalaureate credential as their highest education level, and 49% had a bachelor's degree or higher. Information on pathways into STEM occupations can help to illuminate the unique barriers and opportunities faced by skilled technical workers with a sub-baccalaureate attainment—a vital segment of the U.S. workforce. About 75 million workers of all education levels in 2022 reported holding a non-degree work credential; of these workers, 22 million (or 30%) were in STEM occupations. Among non-degree work credentials, 24% of STEM workers reported having a vocational certificate, 38% a license or certification, and 40% had completed a work experience program.³ These types of work-related credentials can serve as an important catalyst in career entry or advancement, allowing individuals to demonstrate mastery of skills and knowledge to potential or current employers.

This InfoBrief highlights some experimental statistics⁴ on the prevalence of non-degree work credentials and sub-baccalaureate credentials among the U.S. STEM workforce from the 2022 NTEWS Pilot. NCSES releases experimental statistical products to benefit users in the absence of other relevant information and to improve future iterations of data collection.

Demographics: Sex and Age of STEM Workers

Among the 72 million female workers in 2022, 12 million (17%) were employed in a STEM occupation: 7% worked in STEM and held a sub-baccalaureate credential, and 10% worked in STEM and had a bachelor's degree or higher. Among the 81 million male workers, 29% worked in STEM: 16% worked in STEM and had a sub-baccalaureate credential, and 13% worked in STEM and had a bachelor's degree or higher.

The proportion of U.S. workers in STEM by sex and age groups in 2022 was studied to examine potential differences among subgroups of STEM workers. Among sub-baccalaureate STEM workers, 37% were 50–75 years old. Within this education and age group, 24% were female and 76% were male. For STEM workers with a bachelor's degree or higher, 28% were 50–75 years old; of this education and age group, 41% were female and 60% were male. Twenty-three percent of STEM workers with a sub-baccalaureate credential were 30–39 years old. Thirty percent were female in this education and age group; 70% were male. Among the 31% of STEM workers with a bachelor's degree or higher aged 30–39 years, 43% were female and 57% were male (see [table 1](#)).

Table 1. U.S. STEM workers, by education level, sex, and age groups: 2022

(Number and percent)

Education level and age group	Female		Male		Total	
	Number	Percent of total within education level and age group	Number	Percent of total within education level and age group	Number	Percent of total within education level
Sub-baccalaureate credential ^a	5,165,000	28.3	13,064,000	71.7	18,230,000	100.0
29 and younger	1,092,000	33.4	2,174,000	66.6	3,265,000	17.9
30–39	1,263,000	29.7	2,992,000	70.3	4,256,000	23.3
40–49	1,168,000	29.6	2,778,000	70.4	3,946,000	21.6
50–75	1,642,000	24.3	5,120,000	75.7	6,763,000	37.1
Bachelor's degree or higher	7,298,000	41.7	10,214,000	58.3	17,512,000	100.0
29 and younger	1,240,000	40.6	1,814,000	59.4	3,054,000	17.4
30–39	2,341,000	43.0	3,103,000	57.0	5,444,000	31.1
40–49	1,705,000	42.1	2,341,000	57.9	4,046,000	23.1
50–75	2,013,000	40.5	2,955,000	59.5	4,968,000	28.4

STEM = science, technology, engineering, or mathematics.

^a Sub-baccalaureate credential is an educational award (certificate or degree) that is earned after high school but below the level of a bachelor's degree. Examples include associate's degrees (Associate of Arts or Associate of Science) and vocational certificates.

Note(s):

The National Training, Education, and Workforce Survey 2022 Pilot data are designated as an experimental statistical product. These estimates are experimental statistics and may not meet all the quality standards of the National Center for Science and Engineering Statistics. Users should take caution when using the estimates. Additional information about the experimental statistical product designation can be found in the "Technical Notes" at <https://nces.nsf.gov/surveys/national-training-education-workforce/2022#technical-notes>.

Source(s):

National Center for Science and Engineering Statistics, National Training, Education, and Workforce Survey Pilot, 2022.

Non-Degree Credentials of STEM Workers

In 2022, 75 million workers held a non-degree work credential, and of those workers, 30% were in a STEM occupation. Fifty-four percent of sub-baccalaureate STEM workers had at least one non-degree work credential, and 72% of STEM workers with a bachelor's degree or higher had at least one non-degree work credential. Of those workers who reported having two non-degree work credentials, 13% (or 3.3 million) worked in STEM and had a sub-baccalaureate credential, and 22% (or 5.8 million) worked in STEM and had a bachelor's degree or higher. Of those workers who reported having three non-degree work credentials, 26% (or 1.6 million) worked in STEM and had a sub-baccalaureate credential, and 13% (or 769,000) worked in STEM and had a bachelor's degree or higher.

The career pathway into a STEM occupation can be assisted by earning non-degree work credentials. In some circumstances, obtaining a license that is legally required to work in a specific occupation or earning a certification indicates to employers or potential employers that the individual possesses an industry-recognized skill set and knowledge in a particular occupation. Among the 41 million workers who had a license or certification, 14% were STEM workers with a sub-baccalaureate credential, and 20% were STEM workers with a bachelor’s degree or higher. Among the 42 million workers who had completed a work experience program, 11% were STEM workers with a sub-baccalaureate credential, and 23% were STEM workers with a bachelor’s degree or higher. Finally, among the 31 million workers who earned a vocational certificate, 20% were STEM workers with a sub-baccalaureate credential, and 7% were STEM workers with a bachelor’s degree.

Respondents who had a certification, license, or vocational certificate shared their reasons for getting it in the 2022 NTEWS Pilot. Among STEM workers who obtained a license or certification, 17% of those with sub-baccalaureate credentials reported that they obtained a license or certification to advance their job, and 22% of those with a bachelor’s degree or higher reported that it was required for the job they wanted. Among STEM workers who obtained a vocational certificate, 27% of these workers with a sub-baccalaureate credential reported the reason was job advancement, and 8% of workers with a bachelor’s degree or higher said it was required for the job they wanted (see [table 2](#)).

Table 2. Reasons U.S. STEM workers obtained their work-related non-degree credential, by education level: 2022

(Percent)

Reason for credential	License or certification		Vocational certificate	
	Sub-baccalaureate credential	Bachelor's degree or higher	Sub-baccalaureate credential	Bachelor's degree or higher
Required for the job I am currently doing	15.6	17.8	21.4	6.8
Required for the job I wanted	13.5	21.6	20.1	8.3
To earn more money	16.1	19.0	23.5	7.8
To advance in my job	17.0	19.1	26.8	7.8
Other reasons ^a	16.0	17.8	20.6	7.4

STEM = science, technology, engineering, or mathematics.

^a "Other reasons" includes the following response options: it allowed me to do more in the job I was doing; it was a new or emerging area in my field; I was pursuing my passion; I was exploring potential interest in a new job or field; someone recommended this field or job to me; it was a free or inexpensive opportunity; or some other reason (specify).

Note(s):
Respondents could select more than one reason; therefore, percentages will not sum to 100%.

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Source(s):
National Center for Science and Engineering Statistics, National Training, Education, and Workforce Survey Pilot, 2022.

Definitions and Classifications

Certificates: A credential awarded by an educational institution based on completion of all requirements for a program of study, including coursework and test or other performance evaluations. Certificates are typically awarded for life, like a degree. Examples include data analytics certificates, automotive certificates, and medical insurance billing certificates. Certificates of attendance or participation in a short-term training (e.g., 1 day) are not in the definitional scope for certificates.

Certifications: A credential awarded by a certification body based on an individual demonstrating through an examination process that he or she has acquired the designated knowledge, skills, and abilities to perform a specific job. The examination can be either written, oral, or performance-based. Certification is a time-limited credential that is renewed through a recertification process. Examples include information technology certifications and project management professional certifications.

Licenses: A credential awarded by a government agency that constitutes legal authority to do a specific job. Licenses are based on some combination of degree or certificate attainment, certifications, assessments, or work experience; are time-limited; and must be renewed periodically. Examples include teacher's licenses, licensed certified public accountants, and cosmetology licenses.

Non-degree work credentials: A variety of work-related credentials that verifies completion of a work-related program or demonstrates mastery of skills, knowledge, or abilities in a specific area. Examples include certificates, licenses, certifications, and work experience programs.

Skilled technical workforce: Workers in science and engineering (S&E), S&E-related, and STEM middle-skill occupations, who do not have a bachelor's degree or higher.

Sub-baccalaureate credentials: An educational award (*certificate or degree*) that is earned after high school but below the level of a bachelor's degree. Examples include associate's degrees (Associate of Arts or Associate of Science) and vocational certificates.

Work experience programs: This type of vocational-training program is defined in the NTEWS Pilot as an internship, apprenticeship, clerkship, externship, residency, clinical experience, student teaching, or similar program. These programs provide a structured learning opportunity that helps individuals develop skills and prepare for careers. Work experience programs can be paid or unpaid.

Data Source and Limitations

Data are from the 2022 National Training, Education, and Workforce Survey (NTEWS) Pilot. The NTEWS Pilot samples individuals residing in the United States, ages 16 through 75, and not enrolled in high school. Data from this survey provide information on the prevalence of work-related credentials (vocational certificates, occupational licenses, and industry-recognized certifications) and the relationship between these credentials and employment outcomes.

The NTEWS is in a pilot phase. Survey methods including data collection and post-collection processing are being evaluated, and comprehensive quality measures are not available. The 2022 NTEWS Pilot data are designated as an experimental statistical product. NCSES experimental statistical products are created to benefit users in the absence of other relevant information and are developed using innovative and exploratory methodologies. The NTEWS Pilot data are published to engage data users and other stakeholders in the survey's development to improve quality for future iterations of the survey. Experimental statistical products may not meet some of NCSES's quality standards and, as a result, users should assess the utility limitations of these experimental statistics relative to the intended use. More information about the NCSES quality standards is available on the [NCSES quality and transparency](#) website.

NCSES has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN24-050).

Notes

- 1** This excerpt is from the May 2024 “The STEM Labor Force: Scientists, Engineers, and Skilled Technical Workers” thematic report (NSB-2024-5) of *Science & Engineering Indicators*: “STEM occupations are a subset of all U.S. occupations that utilize science, engineering, mathematics and/or technology in the primary functions of their job. Workers in STEM occupations can have any educational background.” For more information on occupations and its terminology see <https://nces.nsf.gov/pubs/nsb20245/terminology>.
- 2** The universe of this analysis used all NTEWS Pilot respondents ages 16 through 75 years who reported ever having worked for pay or profit in 2022. For more information on the NTEWS Pilot data, (e.g., survey description, technical notes, and full set of data tables) visit the [NTEWS page](#).
- 3** NTEWS Pilot respondents could have more than one type of work-related credential; therefore, these percentages do not sum to 100%.
- 4** The estimates included in the NTEWS Pilot are not official statistics and should not be used to make official statements or inferences about characteristics of the population or economy. The 2022 NTEWS Pilot data are designated as an experimental statistical product. Experimental statistical products may not meet some of NCSES’s quality standards and, as a result, users should assess the utility limitations of these experimental statistics relative to the intended use. See the “[Data Source and Limitations](#)” section for more information.

Suggested Citation

National Center for Science and Engineering Statistics (NCSES). 2025. *New Pilot Data on the Prevalence of Work-Related Credentials among STEM Workers from the National Training, Education, and Workforce Survey*. NSF 25-352. Alexandria, VA: U.S. National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf25352>.

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