INTRODUCTION

With advancements and innovations in technology, the workforce of South Carolina needs comprehensive knowledge of Science, Technology, Engineering, and Mathematics (STEM). Is South Carolina producing the right STEM knowledge at the right levels? By taking a look at what jobs employers are advertising, you can see what may or may not be needed, in the near future.
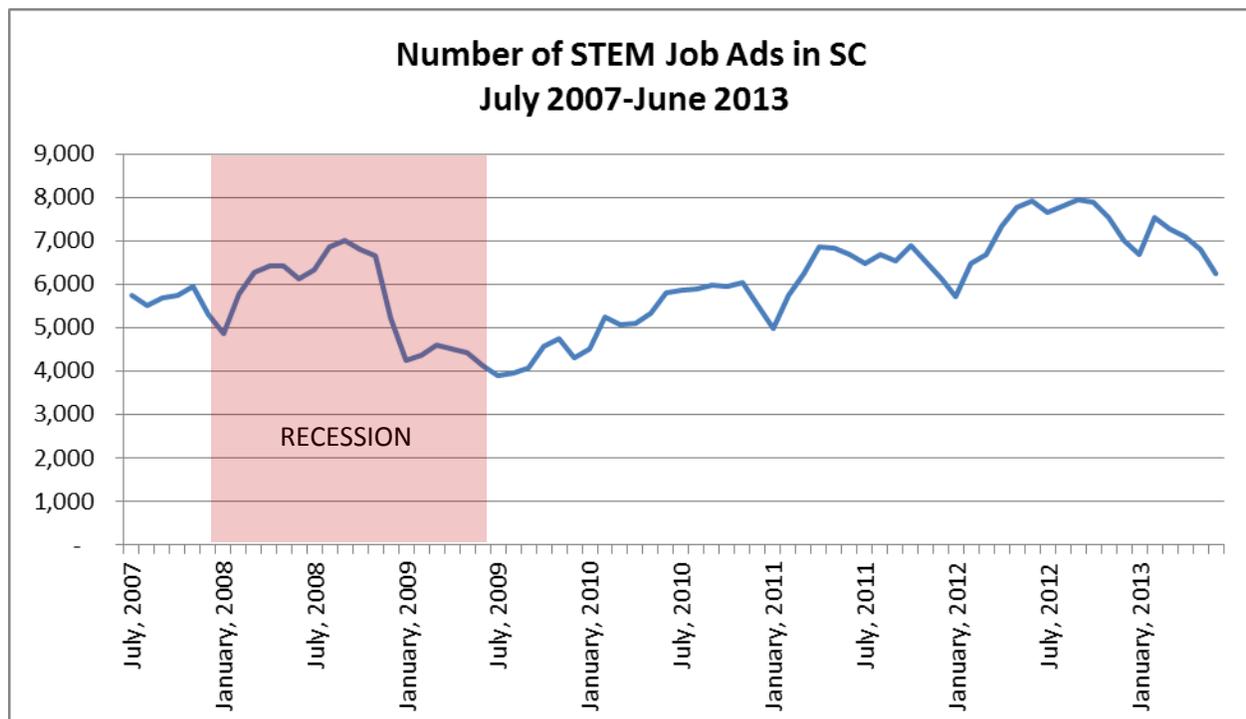
STEM OCCUPATIONS

The US Department of Labor's Bureau of Labor Statistics (BLS) lists 184 occupations as STEM-related. These differ from other lists such as the Occupational Network (O*Net) and the 16 career clusters used in SC public schools that were developed by the Perkins Collaborative Resource Network. The BLS list includes the usual science, technology, engineering, and math occupations, plus some occupations in the areas of information technology, management, education, healthcare, and sales.

DATA

Most of the data used to analyze the demand for STEM experience is from The Conference Board Help Wanted OnLine® Data Series (HWOL). It "measures the number of new, first-time online jobs and jobs reposted from the previous month for over 16,000 Internet job boards, corporate boards and smaller job sites that serve niche markets and smaller geographic areas" (from www.conference-board.org/data/helpwantedonline.cfm). It is a robust data resource for determining short-term employer demand. Supply data is from the SC Commission on Higher Education using completers from post-secondary institutions of learning.

HISTORICAL DATA

STEM ads since July 2007 have seen a fairly steady increase, except right after the recession ended in 2009 when it bottomed out at 3,879 in July. The highest level was recorded in September 2012 at 7,935, and is currently (June 2013) at 6,235.

Number of STEM Job Ads in SC
July 2007-June 2013

STATEWIDE SUMMARY

Job ads for STEM occupations totaled 16,508 in July 2013, down 3.0 percent from the July 2012 level of 16,998.

There were two major occupational groups that had overall growth from July 2012 to July 2013:
- Life, Physical, and Social Science: 9.1 percent
- Healthcare Practitioners and Technical: 13.5 percent

Five major categories reported losses:
- Management: -18.7 percent
- Computer and Mathematics: -14.7 percent
- Architectural and Engineering: -44.3 percent
- Education, Training and Library: -6.9 percent
- Sales and Related: -19.6
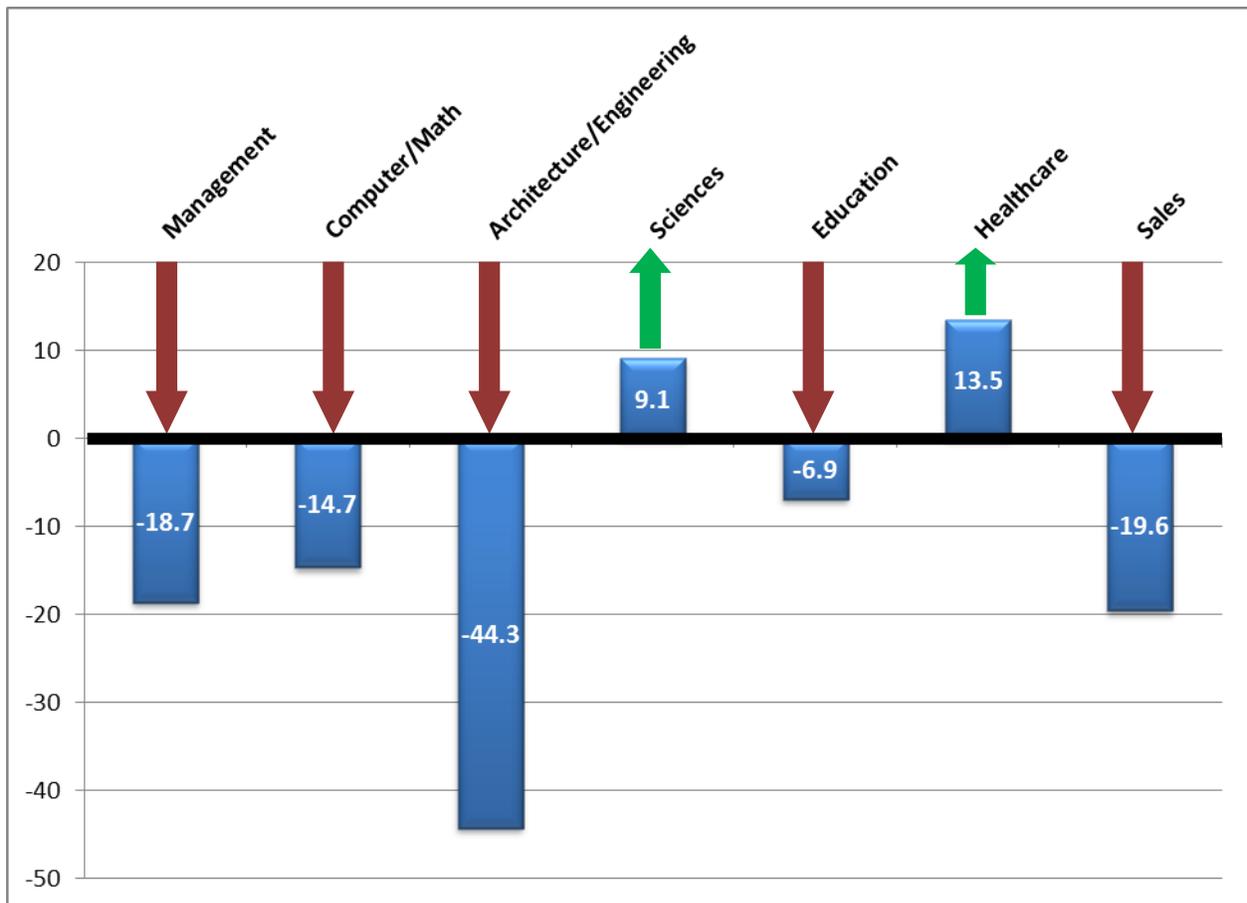
When looking specifically at the occupations, there are many that are growing.

Growing STEM Job Ads in SC, July 2013

Occupation	Jul-13	Jul-12	# change
Computer and Mathematical Occupations			
Database Administrators	158	127	31
Computer Network Architects, Telecommunications Engineering Specialists	76	70	6
Network and Computer Systems Administrators	615	612	3
Statisticians	7	4	3
Actuaries	6	5	1
Architecture and Engineering Occupations			
Industrial Engineering Technicians	112	90	22
Surveyors	14	5	9
Surveying Technicians	9	7	2
Life, Physical, and Social Science Occupations			
Chemical Technicians	35	18	17
Food Science Technicians	8	1	7
Park Naturalists	5	1	4
Food Scientists and Technologists	7	4	3
Biologists	3	-	3
Quality Control Analysts	13	10	3
Atmospheric and Space Scientists	5	3	2
Environmental Science and Protection Technicians, Including Health	41	39	2
Forensic Science Technicians	3	1	2
Foresters	2	1	1
Medical Scientists, Except Epidemiologists	52	51	1
Environmental Scientists and Specialists, Including Health	16	15	1
Neuropsychologists and Clinical Neuropsychologists	2	1	1

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Growing STEM Job Ads in SC, July 2013 (continued)

Occupation	Jul-13	Jul-12	# change
Education, Training, and Library Occupations			
Health Specialties Teachers, Postsecondary	38	25	13
Economics Teachers, Postsecondary	14	11	3
Healthcare Practitioners and Technical Occupations			
Registered Nurses; Advanced Practice Psychiatric Nurses; Critical Care Nurses	3,799	2,803	996
Nurse Practitioners	581	186	395
Physicians and Surgeons, All Other; Hospitalists	213	153	60
Speech-Language Pathologists	380	328	52
Internists, General	205	158	47
Family and General Practitioners	300	256	44
Licensed Practical and Licensed Vocational Nurses	361	320	41
Dentists, General	95	59	36
Surgeons	102	73	29
Pharmacists	159	142	17
Medical and Clinical Laboratory Technologists	61	45	16
Dietitians and Nutritionists	82	71	11
Respiratory Therapists	66	60	6
Psychiatrists	79	74	5
Emergency Medical Technicians and Paramedics	62	60	2
Sales and Related Occupations			
Sales Engineers	56	51	5

There was an abundance of advertisements in the Healthcare Practitioners and Technical occupations from 2012 to 2013. Most of the growing jobs required extensive post-secondary or advanced education.

Job ads for engineering occupations decreased the most with industrial, mechanical, electrical, and civil engineering ads dropping triple digits over the year. The data also shows the need for physical and occupational therapists has declined.

Declining* STEM Job Ads in SC, 2012-2013

Occupation	Jul-13	Jul-12	% change
Management Occupations			
Medical and Health Services Managers	542	637	-95
Architectural and Engineering Managers	121	163	-42
Computer and Mathematical Occupations			
Computer Systems Analysts, Informatics Nurse Specialists	495	642	-147
Web Developers	423	514	-91
Computer User Support Specialists	656	727	-71
Computer Programmers	244	313	-69
Computer Occupations, All Other	554	621	-67
Software Developers, Applications	360	414	-54
Software Developers, Systems Software	67	119	-52
Information Security Analysts	135	166	-31
Operations Research Analysts	41	58	-17
Architecture and Engineering Occupations			
Industrial Engineers	814	1,060	-246
Mechanical Engineers	283	501	-218
Electrical Engineers	211	411	-200
Civil Engineers	133	253	-120
Chemical Engineers	25	60	-35
Electronics Engineers, Except Computer	45	80	-35
Environmental Engineers	24	39	-15
Industrial Safety and Health Engineers	62	77	-15
Manufacturing Engineers	37	51	-14
Materials Engineers	21	34	-13
Mechanical Drafters	20	33	-13
Healthcare Practitioners and Technical Occupations			
Physical Therapists	887	1,133	-246
Occupational Therapists	777	963	-186
Physician Assistants	209	272	-63
Radiologic Technologists	82	117	-35
Sales and Related Occupations			
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	332	413	-81

*Decline of at least 10

STEM EMPLOYERS

Most of the top 30 employers placing STEM online job ads are healthcare facilities.

Top Companies Advertising STEM Jobs in SC, July 2013
Bon Secours
Expinfo, Inc.
CVS Caremark
Palmetto Heatlh
HCA - The Healthcare Company
Charleston County School District
Fresenius Medical Care
Community Health Systems Inc
McLeod Health
Tenet Healthcare Corporation
Department of Veterans Affairs
Doctors Hospital
Our Lady of Bellefonte Hospital
University of South Carolina
Unitedhealth Group
URS Corporation
Education Corporation of America
PSA Healthcare
Greenville Hospital System
Engility Corporation
Vista Health
Amedisys Inc.
HealthSouth
Imagine One Technology
Spartanburg Regional Healthcare System
SAIC
Greenville Health System
Grand Strand Regional Medical Center
Benefitfocus.com
The Boeing Company

GEOGRAPHICAL DISTRIBUTION

Richland County edges out Charleston County for the most STEM ads, with Greenville County close behind.

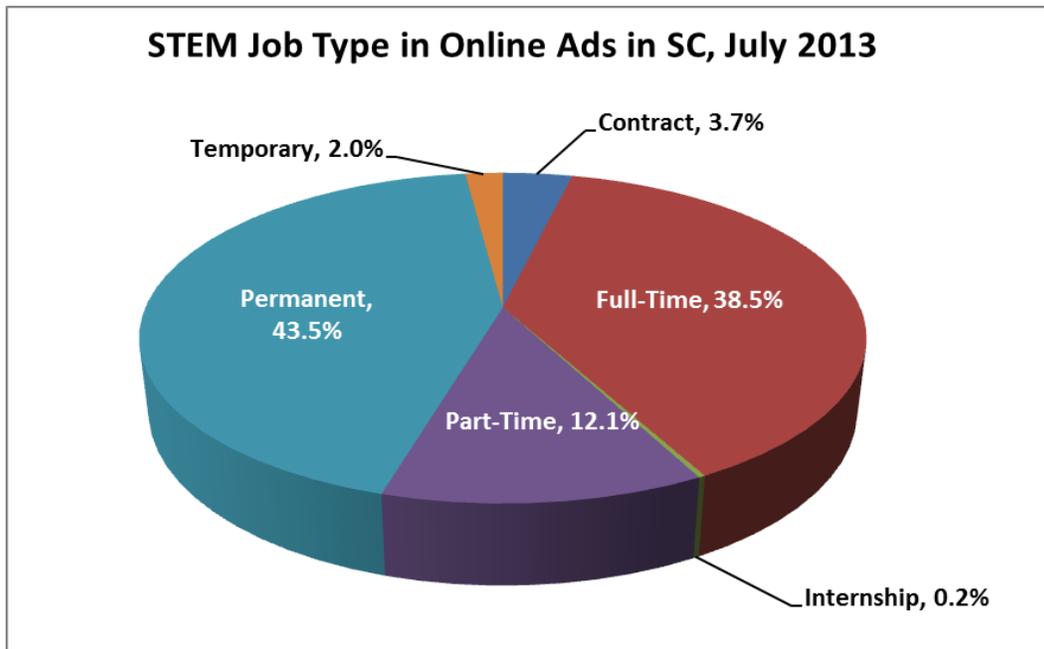| Top 25 Counties for STEM Job Ads, July 2013	
County	**# of Ads**
Richland County	4,105
Charleston County	4,046
Greenville County	3,518
Horry County	1,126
Spartanburg County	987
York County	928
Florence County	778
Beaufort County	707
Anderson County	509
Aiken County	501
Lexington County	479
Sumter County	423
Pickens County	341
Orangeburg County	279
Georgetown County	249
Oconee County	246
Greenwood County	221
Dorchester County	207
Darlington County	200
Berkeley County	152
Laurens County	142
Lancaster County	136
Kershaw County	123
Colleton County	112
Cherokee County	112

OTHER JOB AD INFORMATION

Eighty-two percent of the STEM job ads are full-time, permanent positions.

STEM Job Type in Online Ads in SC, July 2013

- Contract, 3.7%
- Temporary, 2.0%
- Permanent, 43.5%
- Full-Time, 38.5%
- Part-Time, 12.1%
- Internship, 0.2%

STEM jobs ads do not stay in the system long, intimating that there is a fairly smooth supply-demand interface. Almost 50 percent of the ads stay online for 59 days or less.

Age of STEM Job Ads in SC, July 2013

- At least 360 days, 9.2%
- 180 to 359 days, 14.2%
- 120 to 179 days, 9.0%
- 90 to 119 days , 6.8%
- 60 to 89 days, 11.2%
- Less than 30 days, 28.2%
- 30 to 59 days , 21.3%
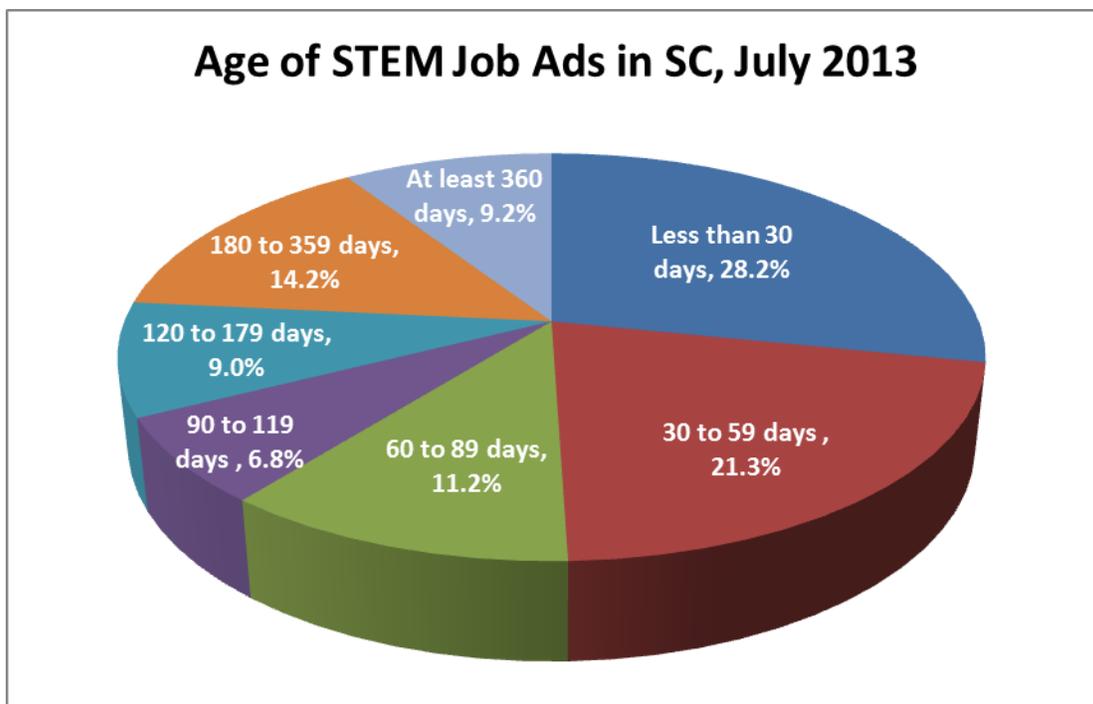
CERTIFICATIONS AND SKILLS

HWOL also allows tracking of professional certifications and skills mentioned in online ads. Those interested in STEM careers would be wise to get a healthcare-related or Top Secret certification and hone their communication and problem-solving skills.

Top Certifications Requested in STEM Job Ads in SC, July 2013

Certified Registered Nurse
Basic Life Support
Certification in Cardiopulmonary Resuscitation
Advanced Cardiac Life Support
Licensed Practical Nurse
Top Secret Sensitive Compartmented Information
Occupational Safety & Health Administration Certification
Physical Therapist Certification
Board Certified
Pharmacy Technician

Top Skills Requested in STEM Job Ads in SC, July 2013

Oral and written communication skills
Problem solving
Cash registers
Customer service oriented
Sales experience
Self-starting / Self-motivated
Microsoft Office
Troubleshooting
Detail oriented
Organizational skills

SUPPLY vs. DEMAND

After reviewing the demand, does South Carolina have enough qualified, trained people to keep the STEM workforce pipeline flowing?

Data from the SC Commission on Higher Education (CHE) (http://www.che.sc.gov/New_Web/_Data&Pubs.htm) on college graduates was used as the supply data.

| STEM Pathway	Certificate	Diploma	Associate	Bachelors	Post Bach	Masters	Doctors-Research	Doctors-Prof. Practice	Total	% of Total
Architecture & Engineering	565	59	477	1,044	-	419	112	-	2,676	16.2
Computer & Math	375	-	469	732	3	135	48	-	1,762	10.6
Management	184	-	376	366	-	17	7	-	950	5.7
Education	-	-	-	271	-	32	-	-	303	1.8
Healthcare	2,385	1,045	2,055	1,475	10	537	133	491	8,137	49.2
Science	16	-	2	2,220	6	198	127	-	2,569	15.5
Sales	62	-	86	-	-	-	-	-	148	0.9
									16,545	

Degree Completers by STEM Pathway in SC, 2011
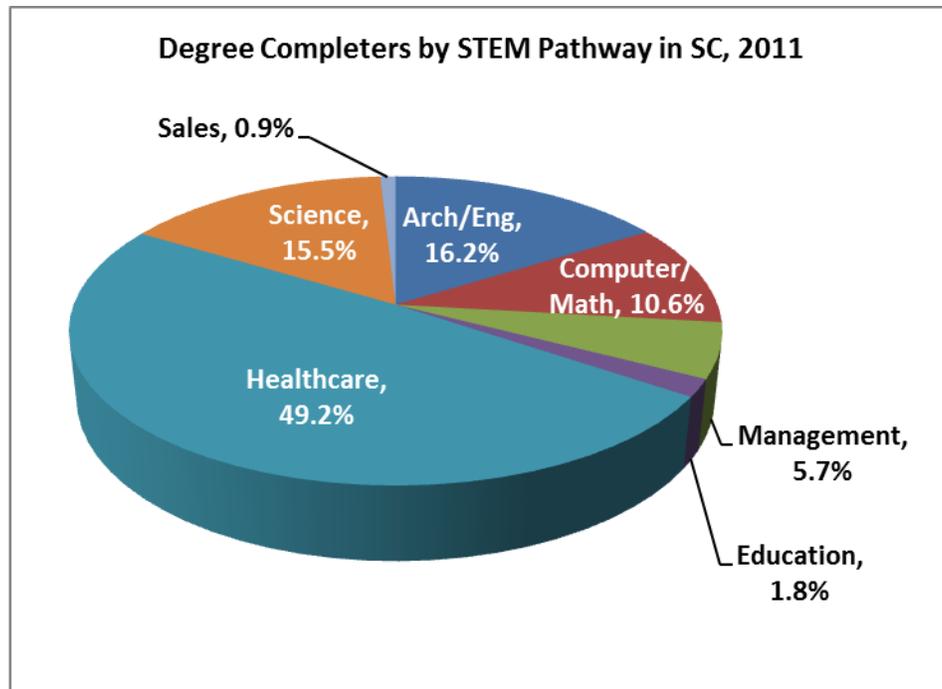
There were 16,545 STEM-related degrees awarded in 2011. CHE has collected data from all public and private schools in the state. Healthcare degrees were the highest, bringing in almost 50 percent of the STEM degrees awarded.

It is interesting to note that 49.3 percent of the STEM degrees awarded were less than a Bachelor's degree.

STEM Completers by Level in SC, 2011
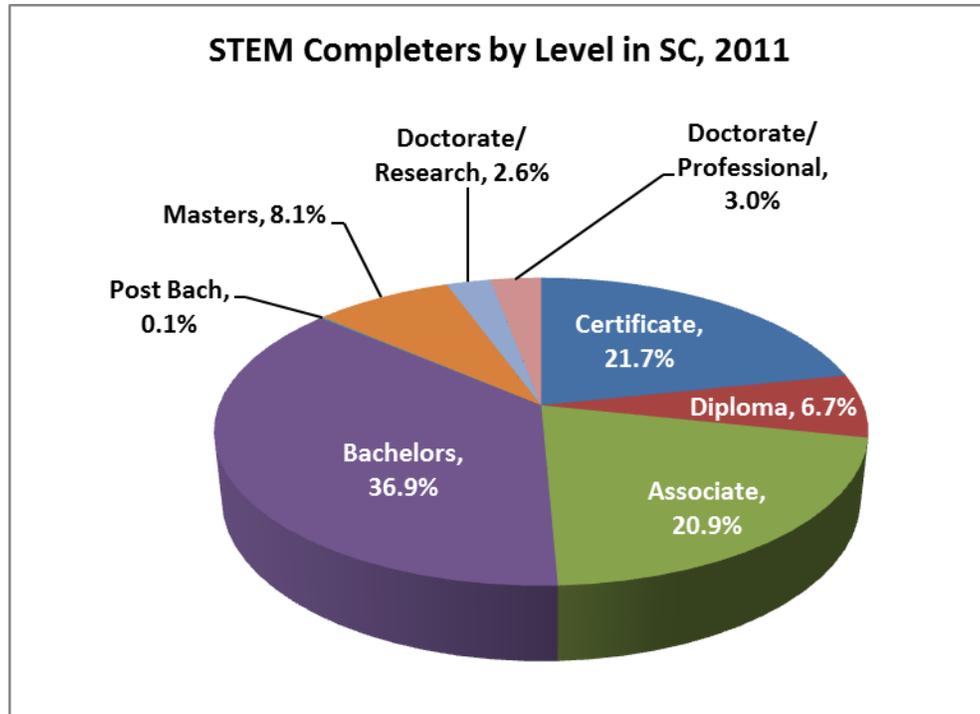
		% of Total
Certificate	3,587	21.7
Diploma	1,104	6.7
Associate	3,465	20.9
Bachelors	6,108	36.9
Post Bach	19	0.1
Masters	1,338	8.1
Doctorate-Research	427	2.6
Doctorate-Prof. Practice	491	3.0

Supply-Demand Analysis for STEM Jobs in SC

	Supply	Demand	Difference (S-D)
Architecture & Engineering	16.2	12.7	3.5
Computer & Math	10.6	23.4	-12.8
Management	5.7	4.8	0.9
Education	1.8	0.8	1.0
Healthcare	49.2	54.3	-5.1
Science	15.5	1.7	13.8
Sales	0.9	2.4	-1.5

When comparing supply to demand, there were only a few STEM areas that have equilibrium. Management, Education, and Sales were fairly balanced.

The largest difference was in Science where the data show much more supply than demand. The majority of Science degrees conferred was in Biology. The Computer and Mathematics pathway was also out of balance with a very large need for more individuals with those degrees in order to fill the demand. The demand was mostly in the Computer side of this category.

CONCLUSION

Although the overall number of STEM jobs advertised online has been declining, there is still a great need for certain types of STEM jobs such as in Healthcare and Science. Specific STEM occupations that had a large increase in job ads include higher-level nursing (Registered, Advanced Psychiatric, and Acute Care) and Nurse Practitioners, along with Database Administrators. Declining STEM jobs were mostly in engineering (Industrial, Mechanical, Electrical, and Civil Engineers) and medical therapy (Physical and Occupational Therapists).

Geographically, the metropolitan areas (Richland, Charleston, Greenville, and Horry counties) are the most flush with STEM job ads.

There were 16,545 higher-education graduates with STEM-related training in 2012. Most were in Healthcare, and Architecture and Engineering. Over 49 percent of those STEM graduates received degrees, certificates, or diplomas that required less than a bachelor's degree.

There is a mismatch in Science (more supply than demand), especially in Biology. With more demand than supply, the state needs to graduate more students with degrees in the STEM-related areas of Computer Science.