Analyzing the Supply and Demand for STEM Workers

LMI FORUM
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The Panelists

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Unable to participate: Leonard Lynn, Professor Emeritus, Case Western Reserve University

MODERATOR: Lesley Hirsch, NYC Labor Market Information Service
What is STEM?

STEM occupations—technical jobs in science, technology, engineering, and mathematics—play an instrumental role in expanding scientific frontiers, developing new products, and generating technological progress. These occupations are concentrated in cutting edge industries such as computer systems design, scientific research and development, and high-tech manufacturing industries. Although educational requirements vary, most of these occupations require a Bachelor’s degree or higher.

SOURCE | BUREAU OF LABOR STATISTICS
STEM Occupations: A Working Definition

- Computer and Mathematical
- Architectural and Engineering
- Life, Physical and Social Sciences
- Healthcare Practitioners and Diagnosticians

Selected Titles in:
- Management
- Education
- Sales
Integrator Skills: A Working Definition

Appreciation for and ability to balance the interdependency of STEM, social, political, human, regulatory, economic, operations, and maintenance into elegant solutions.
Top STEM “Hard” and “Soft” Skills in Demand

SOURCE | WANTED ANALYTICS™, MY ANALYTICS, FEB 3 THRU JUNE 3, 2015, NATIONAL DATA

ENGINEERS
(N = 453,848 ADS)
1. Oral and written communication
2. Project management
3. Problem-solving/troubleshooting
4. CAD
5. Quality assurance
6. Product development
7. Creativity
8. Self-motivated; work independently
9. Team orientation
10. Leadership

ALL OTHER STEM OCCUPATIONS
(N = 1,660,586 ADS)
1. Oral and written communication
2. Project management
3. Problem-solving/troubleshooting
4. Java
5. Software development
6. Linux
7. Oracle
8. Creativity
9. Detail orientation
10. Self-motivated
OCCUPATIONAL EMPLOYMENT OF US WORKERS AGES 35 TO 54 WITH STEM BACHELOR’S DEGREE

FIELD OF DEGREE

- LIFE SCIENCES (n=1,028,717): 63.0% (LIFE SCIENCES), 15.8% (ENGINEERING), 35.7% (MATH)
- COMPUTER SCIENCE (n=895,495): 50.2% (MATH), 15.8% (ENGINEERING), 10.1% (LIFE SCIENCES)
- ENGINEERING (n=2,355,729): 69.9% (ENGINEERING), 75.0% (PHYSICAL SCIENCES), 70.0% (ALL STEM)
- ENGINEERING TECHNICALITIES (n=470,782): 88.2% (ENGINEERING), 49.2% (ALL STEM), 18.7% (PHYSICAL SCIENCES)
- MATH (n=303,725): 13.1% (ENGINEERING), 49.2% (ALL STEM), 70.0% (PHYSICAL SCIENCES)
- PHYSICAL SCIENCES (n=305,901): 92.3% (ALL STEM), 70.0% (PHYSICAL SCIENCES), 49.2% (MATH)
- ALL STEM (N=5,360,349): 85.3% (TOTAL), 70.0% (ALL STEM), 49.2% (MATH)
- ALL OTHER (11,804,290): 100% (TOTAL), 85.3% (NONSTEM), 70.0% (ALL STEM)

SOURCE | American Community Survey, Public Use Microdata Sample, 2013
| Non-STEM Occupations Most Frequently Held by STEM Graduates, Ages 35-54 |
|-----------------|-----------------|-----------------|
| **COMPUTER SCIENCE** | **ENGINEERING** | **LIFE SCIENCES** |
| Miscellaneous Managers | Miscellaneous Managers | Physicians and Surgeons |
| Management Analysts | General and Operations Managers | Miscellaneous Managers |
| Elementary and Middle School Teachers | Postsecondary Teachers | Postsecondary Teachers |
| General and Operations Managers | Management Analysts | Elementary and Middle School Teachers |
| Accountants and Auditors | Postsecondary Teachers | Farmers, Ranchers, and Other Agricultural Managers |
| Postsecondary Teachers | Marketing and Sales Managers | Veterinarians |
| First-Line Supervisors of Retail Sales Workers | Sales Representatives, Wholesale and Manufacturing | Sales Representatives, Wholesale and Manufacturing |
| First-Line Supervisors of Non-Retail Sales | Constructions Managers | Dentists |
| Marketing and Sales Managers | Industrial Production Managers | Registered Nurses |
| Financial Managers | Physicians and Surgeons | General and Operations Managers |
| **MATH** | **PHYSICAL SCIENCE** | **ALL STEM** |
| Elementary and Middle School Teachers | Miscellaneous Managers | Miscellaneous Managers |
| Postsecondary Teachers | Postsecondary Teachers | Physicians and Surgeons |
| Secondary School Teachers | Elementary and Middle School Teachers | Postsecondary Teachers |
| Miscellaneous Managers | Secondary School Teachers | Elementary and Middle School Teachers |
| Accountants and Auditors | Physicians and Surgeons | Farmers, Ranchers, and Other Agricultural Managers |
| Management Analysts | Management Analysts | Veterinarians |
| General and Operations Managers | General and Operations Managers | Sales Representatives, Wholesale and Manufacturing |
| Education Administrators | Registered Nurses | Marketing and Sales Managers |
| Financial Managers | Sales Representatives, Wholesale and Manufacturing | First-Line Supervisors of Retail Sales Workers |
| Physicians and Surgeons | First-Line Supervisors of Retail Sales Workers | Secondary School Teachers |
PANEL THEMES

LEVELS OF SPECIFICITY/GENERALIZATION
  ◦ FIELD
  ◦ EXPERIENCE LEVEL
  ◦ REGION

WORKER MOBILITY

RESEARCH AND POLICY AGENDAS

NON-TECHNICAL REQUIREMENTS: “THE INTEGRATORS”

IDENTIFYING AND CULTIVATING STEM LEADERS

WORK-BASED LEARNING IMPLICATIONS
  ◦ SECONDARY
  ◦ POSTSECONDARY

RELATIONSHIP TO IMMIGRATION POLICY

AVAILABILITY OF APPROPRIATE DATA AND MEASURES
THANK YOU!

YOUR QUESTIONS & COMMENTS?