ENGINEERING SKILLS Survey Results (Survey 2)

A joint project by: South Bay Workforce Investment Board, West Los Angeles College, Training Funding Partners and Tooling U-SME

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Executive Summary

Companies in the Advanced Manufacturing sector were asked to participate in an ENGINEERING SKILLS survey to help the project team evaluate the skills needed for workers in engineering roles and to determine the skill gaps that employers see with this workforce. The goal of the project is to create both pre-Apprenticeship and Apprenticeship tracks in engineering which would be innovative and customized to employer needs.

The overarching goal is to create a pipeline of workers to serve the employers' needs for years to come.

This survey is the second of two surveys distributed by the project team.

The Survey related to this report can be found at: https://surveyplanet.com/578cf941a7539ada6d466f1a

Methodology

The survey form questions and form were developed with input from project partners including West LA College (West), South Bay Workforce Board (SBWIB), Tooling U-SME (TU-SME) and Training Funding Partners (TFP). The survey went through a variety of tests, drafts and edits before being finalized.

The final survey asked respondents about their skills development needs in the areas below and respondents were asked to complete the survey online which automatically records their responses. In some cases employers may have been provided a survey form to be completed by hand if easier for the employer.

The survey distribution list was developed jointly by project partners with all providing contacts to include. The lists were scrubbed and duplicates removed and the SBWIB managed the main form of distribution via email including a one-page flyer about the development of Pre-Apprenticeship and Apprenticeships. The SBWIB used Constant Contact to manage the distribution and tracking of clicks and sending follow-ups and reminders.

The survey administrator checked returned surveys via the online tool used – surveyplanet.com. Responses are summarized herein and detailed responses are available in Word, .pdf or Excel format upon request.

Note: The results reported can only be considered the opinions of the survey participants. They cannot be generalized to represent the entire LA County employer population as a whole.

Contact Information of Respondents to Date:
13 Respondents - 12 Companies

Respondent names removed.

Survey Results

Below are summary survey results. Detailed results are available upon request in Word, .pdf or Excel.

What types of training do you currently provide to your ENGINEERING-related employees?

| Type	
Basic Technical Skills	Mechanical Engineering
Blueprint Reading 1	Office Suite Software
Blueprint Reading 2 w GD&T / GD&T	OJT
CATIA	Prototyping
Communication Skills	Quality Control
Electrical Engineering	Shock & Vibration
Electronics	Shop Math
Electronics Cooling	Software Specific Courses/Software Engineering
Engineering Technology	Specialized Role Training
ETP Funded classes	Test Engineering
Finite Element Analysis	Project Management
Innovation Engineering	Thermal Analysis
Machine Tool Technology	Verisurf Software
Mastercam / CAD & CAE / CAD & Drafting	

What training methods do you use for in-house training? Check all that apply.

Type	Count	% of Responses
Instructor Led Classroom	45	19%
Instructor Led Shop Floor	7	11.1%
OJT-Live Production	8	12.7%
Read and Understand	10	15.9%
Job Shadowing	8	12.7%
Self Paced Online Learning	8	12.7%
Tuition Assistance Program for College Coursework	10	15.9%
Other	0	0%

When looking for qualified engineering candidates, what traits and skills are missing from the current application pool?

Response	
Actual experience building aerospace hardware and not just completing a NASA certification class	Knowledge/experience with air force acquisitions
Adequate Education	Leadership
Blueprint Reading 1	Microsoft Excel
Blueprint Reading 2 w/GD&T / GD&T	Model Based Systems Engineering
Broad skill sets enabling transition to the changing needs of employers	Practical Experience / Hands on practical application / Exposure to real world work
Business Acumen	Problem Solving Skills
CATIA	Professionalism
Communication Skills	Project Management
Cyber Security	Qualification
Design	Quality Control
Eagerness & Work Ethic	Shop Math
Eligibility for security clearances	Software experience
Engineering Knowledge & Experience	Space / Space Systems Knowledge
Experience with aerospace projects	Teamwork
Experience with basic hand tools	Testing
Experience with modern technology ie FPGAs	Tools Knowledge
Industry Knowledge	Verisurf software experience
Initiative and eagerness to learn and take on new challenges	Well-rounded candidates, having interests or hobbies in adjacent subject matter

Please rank the following GLOBAL CORE SKILLS as applicable to your Engineering and Engineering related skill requirements.
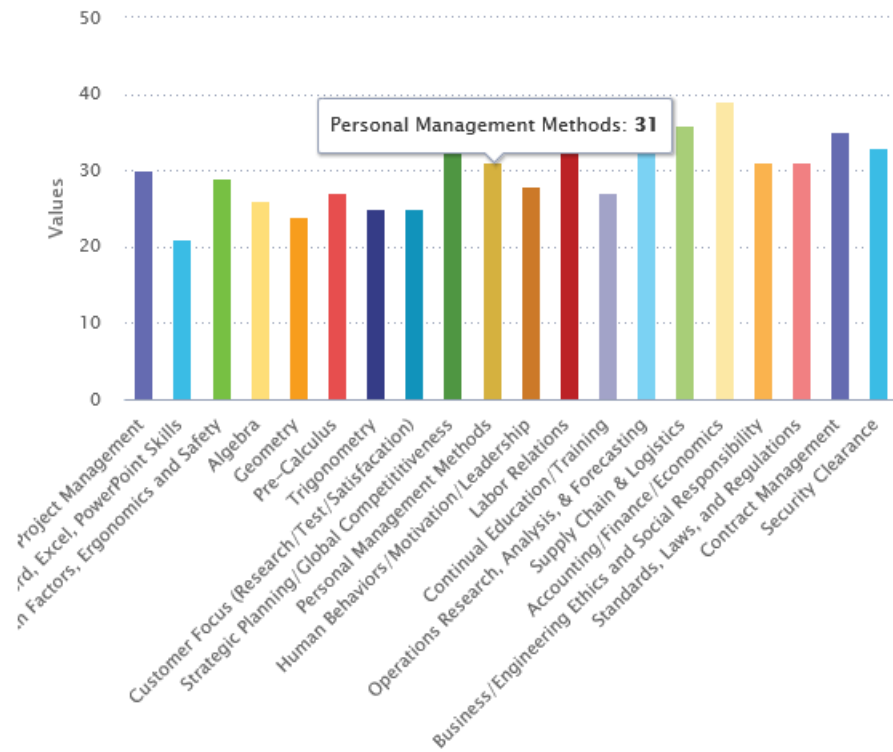
Choices	Totals	Averages
Project Management	30	2
MS Word, Excel, PowerPoint Skills	21	1.4
Human Factors, Ergonomics and Safety	29	1.93
Algebra	26	1.73
Geometry	24	1.6
Pre-Calculus	27	1.8
Trigonometry	25	1.67
Customer Focus (Research/Test/Satisfacation)	25	1.67
Strategic Planning/Global Competititiveness	36	2.4

GLOBAL CORE SKILLS CONTINUED

● Personal Management Methods	31	2.07
● Human Behaviors/Motivation/Leadership	28	1.87
● Labor Relations	39	2.6
● Continual Education/Training	27	1.8
● Operations Research, Analysis, & Forecasting	34	2.27
● Supply Chain & Logistics	36	2.4
● Accounting/Finance/Economics	39	2.6
● Business/Engineering Ethics and Social Responsibility	31	2.07
● Standards, Laws, and Regulations	31	2.07
● Contract Management	35	2.33
● Security Clearance	33	2.2

Please rank the following DESIGN AND DEVELOPMENT SKILLS as applicable to your Engineering and Engineering related skill requirements.

DESIGN AND DEVELOPMENT SKILLS CONTINUED

Choices	Totals	Averages
● Product R&D	28	1.87
● Process R&D	28	1.87
● Process Design & Development	25	1.67
● Product Design & Development	25	1.67
● Process Development & Test	25	1.67
● Product Prototype Build and Test	24	1.6
● Market/Sales/Life Cycle Analysis	32	2.13
● Intellectual Property Protection (e.g. patents, trademarks, copyrights, etc.)	32	2.13
● Design Management	31	2.07
● Simulation/Engineering Design Analysis	27	1.8
● Simulation/Engineering Process Analysis	29	1.93
● Concurrent Engineering	30	2
● Design for X (Manufacturing, Assembly, Maintenance, etc.)	25	1.67
● Drafting/Drawing/Engineering Graphics/Modeling	21	1.4
● CAD/CAM/CAE Applications	21	1.4
● Tolerance Analysis/GD&T	23	1.53
● Blueprint Reading	23	1.53
● Product Liability	34	2.27
● Rapid Prototyping (RP)	30	2
● Production/Manufacturing System Design and Development	25	1.67

DESIGN AND DEVELOPMENT SKILLS CONTINUED

Skill	Count	Rating
Infrastructure/Plant Location Analysis	37	2.47
Facility Planning/Plant Layout	36	2.4
Process Planning & Development	28	1.87
Capacity Planning	35	2.33
Process Documentation/Work Instructions	26	1.73
Tool and Equipment Selection	27	1.8
Maintenance Systems	34	2.27
Mechanical Systems	28	1.87
Equipment/Tool Design and Development	27	1.8
Cutting Tool Design	35	2.33

Skill	Count	Rating
Workholding Tool Design	34	2.27
Die/Mold Design	33	2.2
Gage Design	35	2.33
Machine Design	36	2.4
Nanotechnology, Packaging & Systems	34	2.27
Automated Systems	34	2.27
CNC/PLC/Computer Controls	30	2
Computer Systems and Networks	32	2.13
Information Technology/Database	31	2.07
Enterprise-wide Systems Integration	34	2.27

Please rank the following PROCESS COMPREHENSION SKILLS as applicable to your Engineering and Engineering related skill requirements.
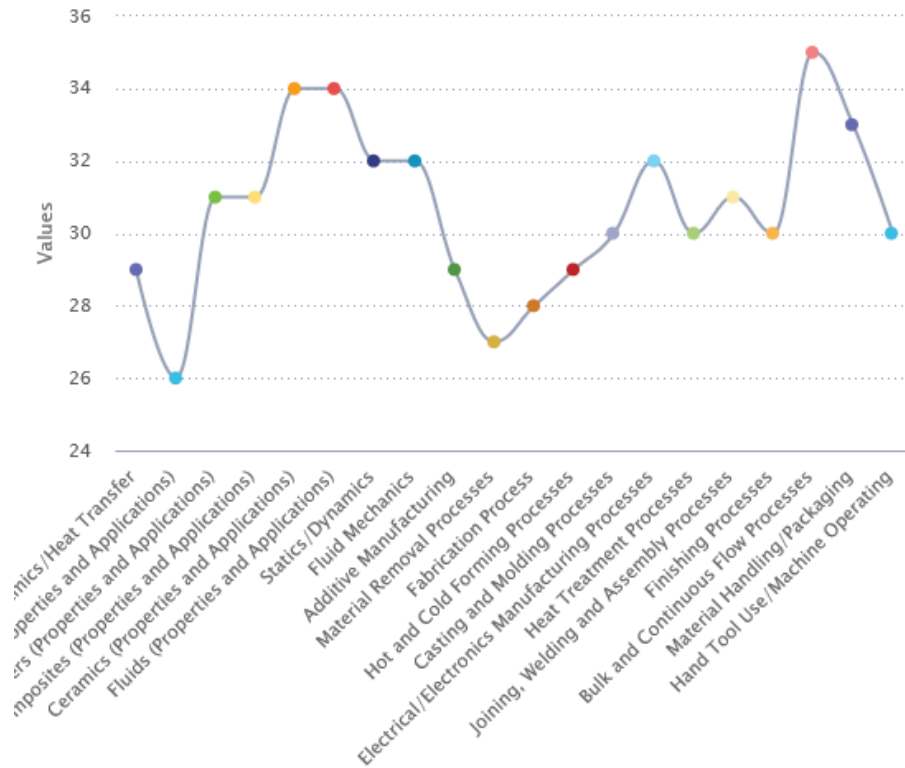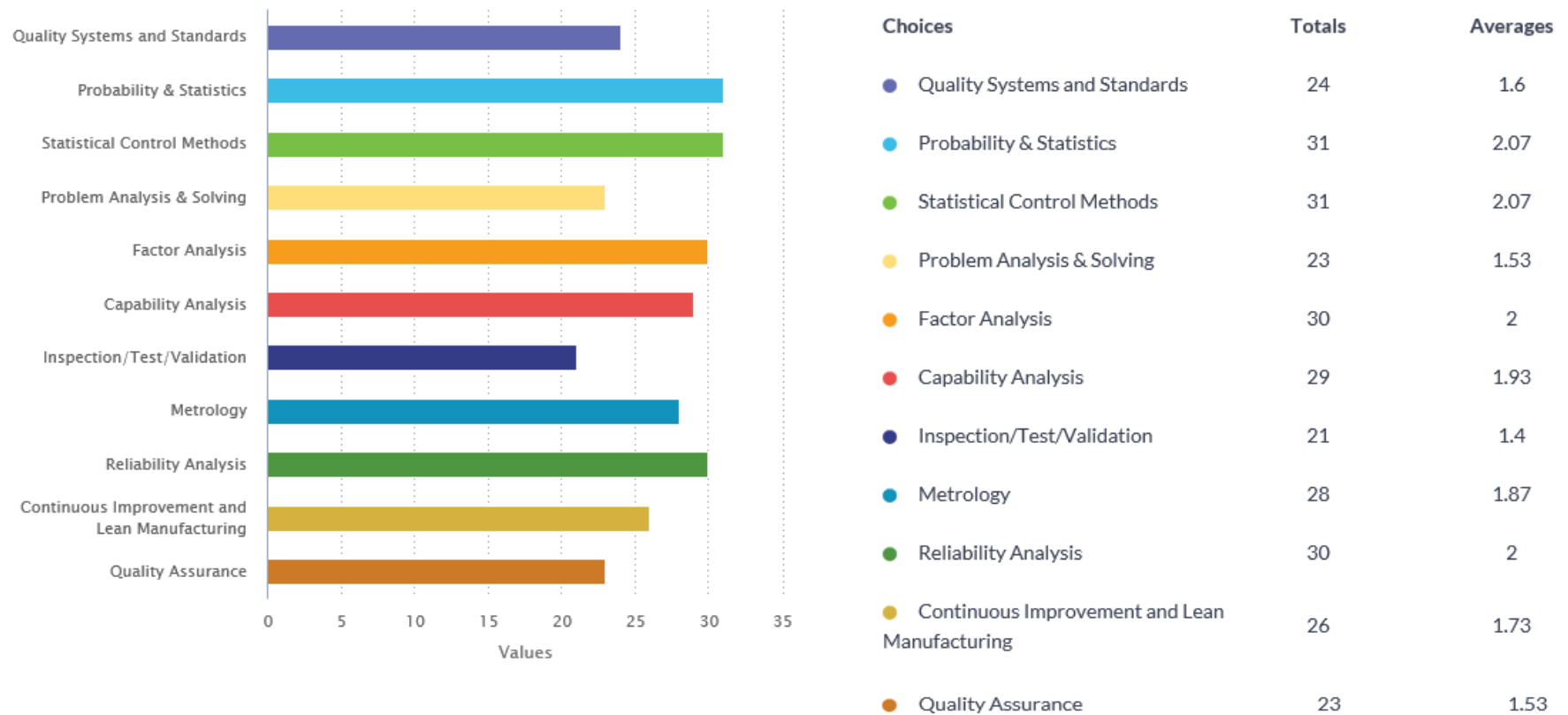

Choices	Totals	Averages
Thermodynamics/Heat Transfer	29	1.93
Metallurgy (Properties and Applications)	26	1.73
Plastics/Polymers (Properties and Applications)	31	2.07
Composites (Properties and Applications)	31	2.07
Ceramics (Properties and Applications)	34	2.27
Fluids (Properties and Applications)	34	2.27
Statics/Dynamics	32	2.13
Fluid Mechanics	32	2.13
Additive Manufacturing	29	1.93

PROCESS COMPREHENSION SKILLS CONTINUED

● Material Removal Processes	27	1.8
● Fabrication Process	28	1.87
● Hot and Cold Forming Processes	29	1.93
● Casting and Molding Processes	30	2
● Electrical/Electronics Manufacturing Processes	32	2.13
● Heat Treatment Processes	30	2
● Joining, Welding and Assembly Processes	31	2.07
● Finishing Processes	30	2
● Bulk and Continuous Flow Processes	35	2.33
● Material Handling/Packaging	33	2.2
● Hand Tool Use/Machine Operating	30	2

Please rank the following QUALITY AND SPC SKILLS as applicable to your Engineering and Engineering-related skill requirements

Choices	Totals	Averages
Quality Systems and Standards	24	1.6
Probability & Statistics	31	2.07
Statistical Control Methods	31	2.07
Problem Analysis & Solving	23	1.53
Factor Analysis	30	2
Capability Analysis	29	1.93
Inspection/Test/Validation	21	1.4
Metrology	28	1.87
Reliability Analysis	30	2
Continuous Improvement and Lean Manufacturing	26	1.73
Quality Assurance	23	1.53

Please rank the following SOFT SKILLS as applicable to your Engineering and Engineering-related skill requirements
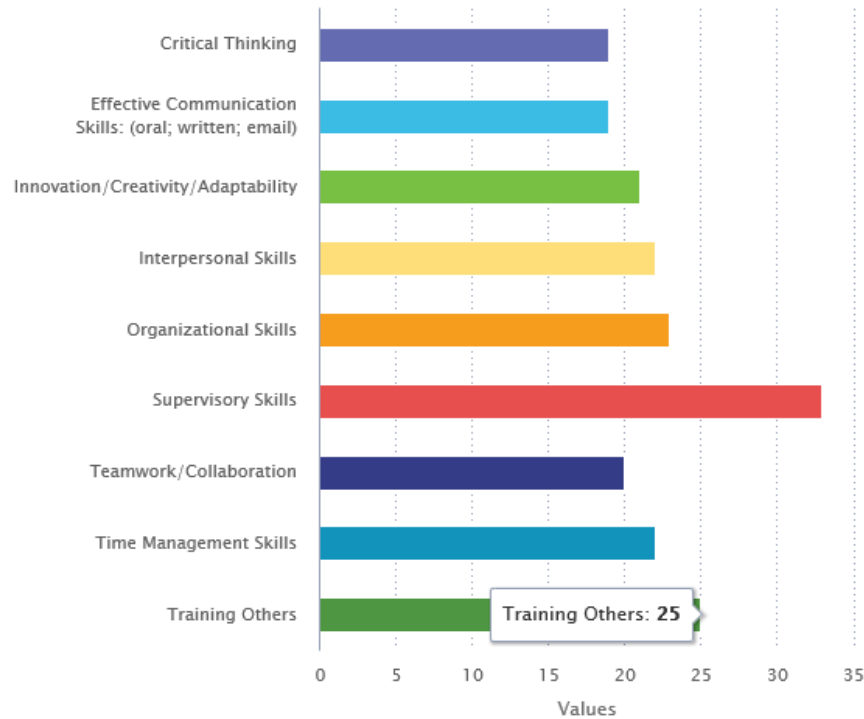
Choices	Totals	Averages
● Critical Thinking	19	1.27
● Effective Communication Skills: (oral; written; email)	19	1.27
● Innovation/Creativity/Adaptability	21	1.4
● Interpersonal Skills	22	1.47
● Organizational Skills	23	1.53
● Supervisory Skills	33	2.2
● Teamwork/Collaboration	20	1.33
● Time Management Skills	22	1.47
● Training Others	25	1.67

Is there anything else you would like to share with us to better serve your needs?
Hands on experience with student projects.