Bridging the Gaps
The Next Generation and the Digital Transformation

ASME International Manufacturing Science and Engineering Conference and the SME North American Manufacturing Research Conference

John Vickers
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www.nasa.gov/spacetech
The Next Generation

https://youtu.be/q2FEblUV-o4
THEORY

SKILL COMPONENTS

“HANDS-ON”

Craftsmanship

Mathematician

Discover languages to quantitatively describe existing world

Scientist

Discover & describe existing world

Engineer

Design & build new systems

Engineer Technologist*

Fabricate & operate new systems

Trades

Build or repair existing systems/components

Traditional

Welding
HVAC
Electricity
Plumbing
Electronics
Manufacturing
(Surgeon 19th C.)

21st Century

A+ Comp Repair
Comp Network Admin
CISCO Network
ORACLE Internet
CAD
Model & Simulation

Algebraist

Geometer

Topologist

Statistician

Cryptologist

Rationalist

Empiricist

Physicist

Chemist

Biologist

Biochemist

Research MD

Astronomer

Astrobiologist

Geologist

Aerospace

Automotive

Chemical

Bio

Bio-chemical

Geo

Electronics

Computer

Civil

Model & Simulation

Research Surgeon

Aircraft Maintenance

Airframe/Powerplant

Particle Detectors

Integrated Circuits

Adv. Manufacturing

Wind Tunnel Tech

“Middle Skills”

4-yr College (+)

4-yr College (+)

4-yr College (+)

2-yr college/Apprenticeship

HS with National Certifications

Traditional Academic

Current K-12 “Gap”

CTE

Discover & describe existing world

Design & build new systems

Fabricate & operate new systems

Build or repair existing systems/components

Jimbatterson@live.com – May 2007
Fortune Favors the Bold

Fig. 20. Names of parts on head of vibrating Singer.
Call to Action

EDUCATION AND WORKFORCE DEVELOPMENT

You can’t bridge this... without a workforce...
The Mars Generation

Systems Thinking, Entrepreneurship, Cultural Agility, Critical Thinking

Joseph E. Aoun, “Robot-Proof, Higher Education in the Age of Artificial Intelligence”