No Longer are We All Young White Guys: E&C Personnel Availability in the 21st Century

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How Do We Do It?

- **Bring Young Bright People from Other Industries**

- **Utilize The World**

- **Attract More College Graduates**

How do we attract more college graduates?

Types of Engineers

- **Scientist**

  Interested in developing new technology. Want to be on the cutting edge of applications. Innovative. Can be very theoretical and/or entrepreneurial.

- **Conceptualizer**

  Ability to understand new technology and adopt it to create practical products, designs, work processes, etc.   Able to use existing techniques to solve new problems. Thrive on surprises and change. A bit of a risk taker. Entrepreneurial or eventually leader of a large organization. But too impatient to learn the business.

- **Detailer**

  Ability to apply known techniques to problems. Well organized. Likes to follow set procedures and wants everyone else to do the same. Dislikes change. "Tell me my givens, the deliverables you want from me and get out of my way." Normally not entrepreneurial but could be good manager of a large engineering effort.

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What Does AMEC Paragon Need

Type	% of Staff
Scientist	0-1%
Conceptualizer	10-20%
Detailer	80-90%

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Problems

- US News and World Reports:

  - Key Performance Indicators tend to orient top engineering schools to focus on educating <u>scientists</u>

- Funding

  - Government funding tends to favor educating <u>scientist</u>

  - Industry funding may allow room to favor <u>conceptualizers</u>

- Faculty

  - Tend to focus where funding and peer recognition steer – <u>scientist</u>

- State Schools

  - With notable exceptions, tend to focus on bulk education - <u>detailers</u>

- Demographics

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# Are Community Colleges a Solution?

- **Engineering perceived as a path for social mobility**

    – **Higher financial reward than liberal arts.**

- **"Enhancing the Role of Community College Pathway to Engineering Careers", National Academy of Engineering, 2005**

- **20% of engineering degree holders began with 10 credit hours or more in community college.**

- **40% of 1999 & 2000 bachelors and masters recipients attended community college at some time**

- **Is there a path through community college to get more detailers and conceptualizers?**

Another Problem – Generational Change

- **Work Force Make - Up**

    - **In 10 years we will lose Matures (pre-1946) and Baby Boomers (1946-1964)**

    - **In 15 years the Millennials (1997 +) will be in charge**

    - **Generation X (1965-1977) have to train them**

Work Force Makeup
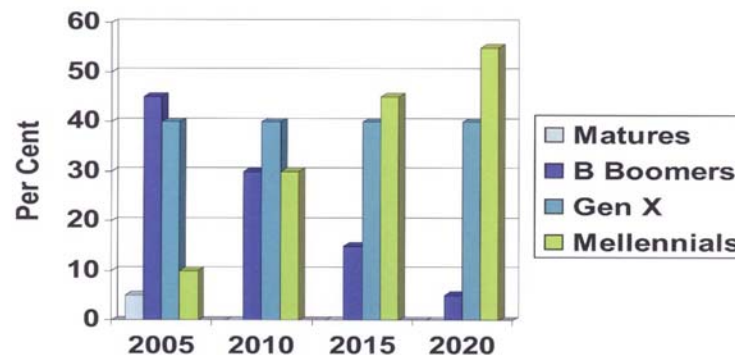
Another Problem – Generational Change

- **Who are the <u>Millennials</u> (1977 +)**

    - **Optimistic**

    - **Group oriented but assert their individualism**

    - **Ambitious**

    - **Short attention span**

    - **50% of Millennials believe that their older work associates do not respect them**

    - **70% of the older work associates believe that the Millennials do not listen to them**

    - **1 out of 3 Millennials is a minority**

Another Problem – Generational Change

- **Who is <u>Generation X</u> (1965 – 1977 sometimes 1960-1965 as well)**

    - Came of age as Boomers started to questions things.

    - No common heroes. Heroes are people they know.

    - Tend to be cynical and pessimistic.

    - Very self reliant. Do not believe in relying on company promises.

    - "Seize the day." Don't count on future, enjoy the moment.

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Bottom Line

- **We need more staff**

- **Many are minorities who are currently not going to college**

- **They are not like the "Matures" and "Boomers"**

- **The "Xers" must train them**

HELP!

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