Grand Challenges for Engineering in the Eyes of 21st Century Students

Initial findings from an ongoing global survey based on the U.S. National Academy of Engineering (NAE) Grand Challenges

An initiative of
Dassault Systèmes

DASSAULT SYSTEMES

Based on the U.S. National Academy of Engineering (NAE) Grand Challenges
http://www.engineeringchallenges.org

NATIONAL ACADEMY OF ENGINEERING
FOUNDED 1964

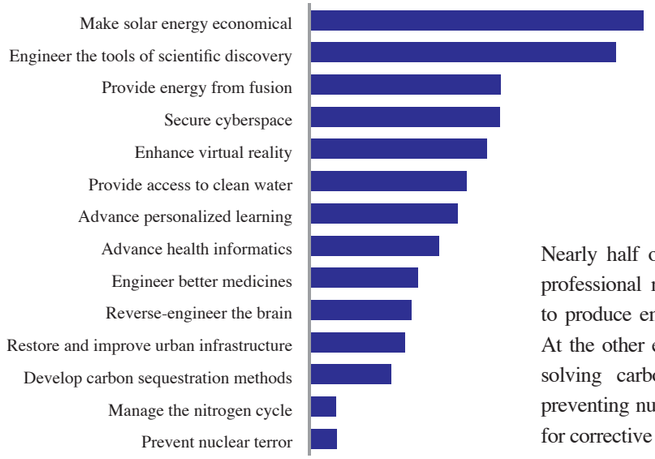
campus.3ds.com

MANAGE THE NITROGEN CYCLE
DEVELOP CARBON SEQUESTRATION METHODS
PROVIDE ENERGY FROM FUSION
MAKE SOLAR ENERGY ECONOMICAL
ADVANCE HEALTH INFORMATICS
ENGINEER BETTER MEDICINES
RESTORE AND IMPROVE URBAN INFRASTRUCTURE
ENHANCE VIRTUAL REALITY
ENGINEER THE TOOLS OF SCIENTIFIC DISCOVERY
PROVIDE ACCESS TO CLEAN WATER
REVERSE-ENGINEER THE BRAIN
ADVANCE PERSONALIZED LEARNING
SECURE CYBERSPACE
PREVENT NUCLEAR TERROR

SPEED
Student Platform for Engineering Education Development

CREATIVE VS. CORRECTIVE ENGINEERING

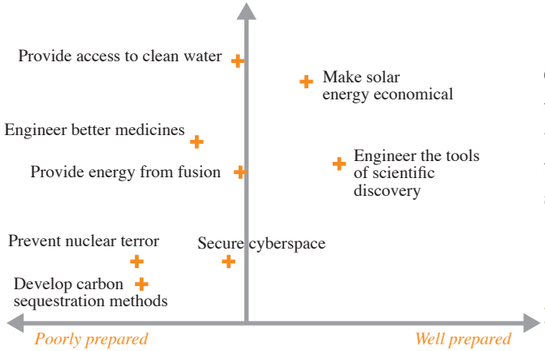
Student ranking of their anticipated professional endeavors



Nearly half of responding students see their future professional role in conjunction with smarter ways to produce energy or in tooling scientific discovery. At the other end of anticipated professional activity, solving carbon and nitrogen issues, as well as preventing nuclear terror rank very low. A reluctance for corrective engineering?

BETTER EQUIPPED FOR THE MOST IMPORTANT CHALLENGES

Perceived future importance of challenges



Preparedness resulting from studies

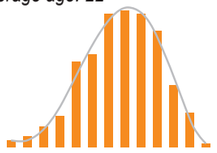
Challenges perceived as important for the future of the planet are not identical to those seen in relation with the professional life of respondents. Overall, they consider that they are better prepared by their studies for the most important challenges.

SURVEY

- *19 nationalities*

- *21% women*

- *Average age: 22*



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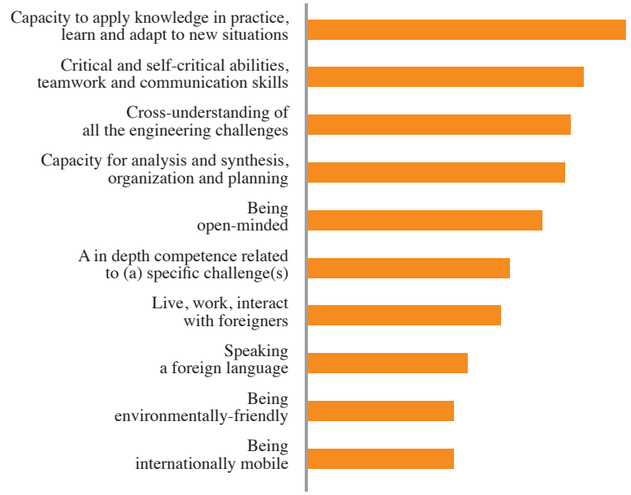
GRAND CHALLENGES FOR ENGINEERING

The next phase of the survey will seek to balance national distribution and focus, among other characteristics, at geographically correlated perceptions.

CHALLENGES NEED ATTITUDES RATHER THAN APTITUDES

Ranking of skills perceived as required to address the challenges



Generic behavioral skills -"know how"- are seen more appropriate to address the challenges than knowledge. Generic contextual skills score double that of common "globalization attributes" such as the practice of languages, readiness for international relocation, or multicultural interaction. Is the global nature of challenges underestimated?

This initial survey of student opinion aims at triggering a dialogue addressing the grand challenges as well as developing an awareness and curiosity among those who will have to provide answers in their professional lives. It has been prepared with the help of SPEED.

SPEED CONTACT INFORMATION

The purpose of SPEED (Student Platform for Engineering Education Development) is to advance engineering education (EE) by providing a platform for global communication among students and other stakeholders. Building a support network for students and empowering students interested in EE to take action locally and globally to improve their own educational environments. By facilitating student action in this manner, SPEED provides a necessary perspective to EE policymakers to promote an EE system that is productive, inclusive, and forward-thinking. To achieve this purpose, actions of the group include the organization of an annual «Global Student Forum», facilitating local events and providing resources for the development of professional skills for students.

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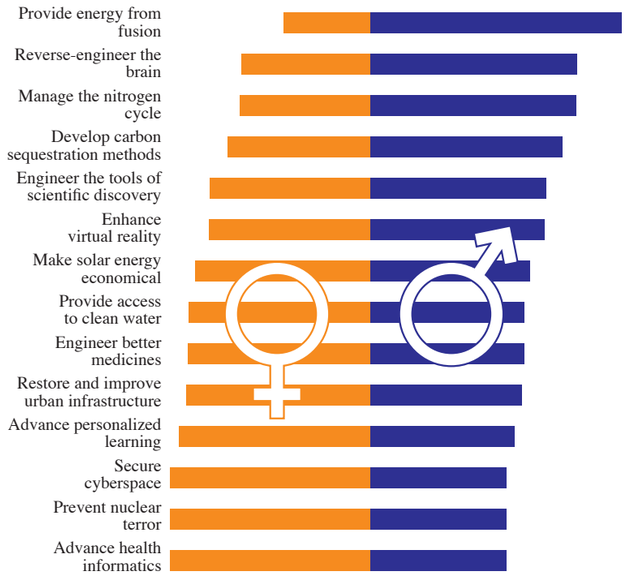
SAFETY & ENERGY AT BOTH ENDS OF A NEW GENDER GAP

Ranking of perceived importance of the challenges among women and men



When extrapolated to equal male/female populations, the resulting ranking of challenges in a top three selection of importance shows the nature of the gender gap. At one end, 74% of the votes for “providing energy from fusion” come from men, the rest from women. At the other end, “advanced health informatics” receives 60% of its score from women and 40% from male.

The perception of importance of the challenges is indeed gender sensitive.