

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Learning and Knowledge Development for a Globally Sophisticated Workforce (5)

Author: Mr. David Vaccaro
Futron Corporation, United States, dvaccaro@avascent.com

Mr. Ian Christensen
Futron Corporation, United States, ichtistensen@futron.com

Mr. Dustin Kaiser
Futron Corporation, United States, dkaiser@futron.com

Mr. Joseph Fuller
Futron Corporation, United States, jfuller@futron.com

Mr. Jay Gullish
Futron Corporation, United States, jgullish@futron.com

COMPARATIVE PROFILING OF THE GLOBALIZED SPACE-SKILLED WORKFORCE POOL

Abstract

In 2013, the number of science and engineering (SE) students graduating worldwide at a first (bachelor's-equivalent) degree level will surpass 2 million annually. Moreover, this figure uses a strict interpretation of SE educational qualification criteria; under more general interpretations of science, technology, engineering, and math (STEM) qualifications, the annual global number of these graduates is higher still.

Against the backdrop of these global graduation patterns, the supply of space-skilled human capital available to the workforce is both growing and changing rapidly, with far-reaching implications for national civil space agency programs and their future activities. Whereas the first wave of space workers were largely male and based predominantly in the United States, Europe, and Russia, statistics show that today's space-skilled graduates are proliferating worldwide, with a level of geographic diversity and gender equity that may catch even longtime observers off-guard.

In order to quantify these demographic shifts, and assess their implications – especially with regard to international collaborative best practices as reflected in the work of IAF's International Programme/Project Management Committee – this paper will be developed in three segments.

Part 1: Quantifying the Space Workforce

Using national and international education databases, this paper will first quantify the talent pool of STEM graduates available to civil space organizations. Among the areas to be surveyed:

- Numbers of space-related university degree programs by country or region;
- Numbers of first-level science and engineering university graduates by world region, and by gender balance;
- Varying attitudes that motivate students to study STEM by country or region

Part 2: Assessing National Talent Management Systems

With the Part 1 statistical overlay in mind, Part 2 will survey national civil space agency programs for cultivating, fostering, and managing their respective space-skilled workforce talent pools. Focus areas will include university outreach, mentorship programs, and career track engagement. Both OECD country space agencies (such as NASA, ESA, JAXA, KARI) and emerging actors (including China, India, Brazil, and South Africa) will be examined.

Part 3: Exploring How To Build a Truly Collaborative Global Space Workforce

Finally, reflecting IAF International Programme/Project Management Committee goals, Part 3 will consider how the strands from Part 1 and 2 of the paper can be integrated toward more globally collaborative results. The paper will propose ways to build upon prior IAF-led research on international space project best practices for collaborative training and human capital development.