National Infrastructure Advisory Council (NIAC)

Workforce Preparation, Education and Research Working Group

Status Report
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NIAC Workforce Preparation, Education & Research Update

- Presented initial findings at July 12 NIAC meeting.
- Since then, the Study Group continues to collect data to support those initial findings.
- Additional recommendations will be delivered to NIAC members to review before the end of 2005.
- The NIAC will be able to deliberate for approval during the January 2006 meeting.

Mission

- Determine what can be done to ensure the current and future workforce is able to meet the nation's needs to secure cyber-based critical infrastructures.
- Motivating Themes:
  - Making Math and Science a National Priority
  - Empowering Families
  - Rigorous Research
  - Setting Up Teachers to Succeed

Initial Findings

- The Working Group will develop final recommendations in the following areas:
  - Research and Development Priorities to Improve Cyber Security
  - Efficacy of Cyber Corps
  - Cyber Security Certification Programs
  - K-12 Math and Science Competency

R&D Priorities for Cyber Security

- Develop a national research agenda to prioritize cyber security research efforts.
- Increase the funding base for critical infrastructure protection and cyber security-related research.
- Conduct additional studies to find solutions for reducing "time to market" with respect to cyber security research products.
- Address critical problems by increasing and stabilizing funding for fundamental research in civilian cyber security to attract an adequate talent pool.
- Designate a coordinating body to oversee cyber security research efforts.

Efficacy of Cyber Corps (Scholarship for Service Program)

- Expand internships and employment options to include owner/operators of Critical Infrastructures.
- Re-invigorate the Information Assurance (IA) research community.
- Restructure NSF capacity development concept to encourage, enable and promote the opportunity for faculty to gain actual experience.
- Begin clearance investigations on each SFS student at the start of their last semester.
- Consider alternative funding allocations.
- Allow each SFS student a free billet applicable for any civilian agency.

Cyber Security Certification Programs

- Develop and maintain standardized IA position descriptions, including required and recommended Knowledge, Skills and Abilities for each level/position within all Federal departments and agencies.
- Establish and fund a privately administered, public-private IA training certification body.
- Review and reform IA testing procedures as required, providing outcome-based, modular computer-based testing and metrics whenever possible.

K-12 Math and Science Competency

Recommendations will be presented on:

- Transparency into:
  - Effectiveness of various curricula
  - Effectiveness of various pedagogical approaches
  - State education standards
  - State tests
  - Depth and breadth of US vs. international curricula

K-12 Math and Science Competency (continued)

- Teacher Preparation and Teacher Colleges
- Suggested bodies of knowledge--what students should know at various age levels
- Test and curricula development using mathematicians and scientists, in addition to educators
- Pedagogy development by educators
- Sequencing subjects for best effect
  - "Physics First"

K-12 Math and Science Competency (continued)

- "Drill and Kill" vs. "Discovery"
- Role of automation in education
  - Low Risk Self-Testing
- Unintended consequences of high stakes testing
- Role of vocabulary
- Market segmentation and "tracking"
- Specialization of labor – math specialists and science specialists

Other Areas

- Green Cards for High Achievers
  - Ph.D. candidates from top schools could be given a Green Card upon graduation instead of sending them home to work when their student visas expire.
  - American companies would be able to hire these students immediately.
  - Safeguards can be placed for obvious homeland security reasons.

Summary

- American students are falling behind their international peers in math and science, affecting the nation's ability to produce a quality cyber security workforce.
- Any one of these recommendations will not be a silver bullet to immediately solve all deficiencies, but even small improvements in several areas can make a difference at the national level.