Summary Report from the

Young Scholars Program

Students, Learning and Technology

July 10 through July 28th

University of Maryland, College Park, MD

**YEAR 1**
**Young Scholars Program**
**Event Summary**

The University of Maryland delivered its *Young Scholars Program: Students, Learning and Technology* (SLT) from July 10 through July 28th.  The course focused its material around activities that would highlight topics in cybersecurity to illustrate the needs to operate in a secure manner and to emphasize the exciting opportunities in this field.  The Cyberwatch Grant supported seven students in the course.

| Name | Gender | Ethinicity |
| --- | --- | --- |
| Lauren Ferrel | F | African-American |
| Nazia Khan | F | Indian (Asia) |
| Ajo Jaji | F | African-American |
| Helen Lemma | F | African-American |
| Constance Pearsall | F | African-American |
| Jana Void | F | African-American |
| J'Nevelyn Woodson | F | African-American |

Students were recruited through the campus Talent Search Program. Funded by the U.S. Department of Education, Talent Search is designed to provide students with early college awareness and post secondary opportunities. The program targets youth in families in which neither parent graduated from college.

The purpose of SLT is to foster excellence in 21st century skills which will help students succeed in college, and prepare themselves with the skills necessary to meet the shifting and constantly changing demands of the future workplace. This course provides a means to explore technology applications essential to college success while also focusing on career possibilities that connect education, science, math and technology. Critical need areas are emphasized such as IT/IA and cybersecurity/computer forensics  with a special focus on exposing students to the plethora of career opportunities in cybersecurity and cybersafety—a critical need area for this region.

Students participate in cutting-edge technology projects, robotic activities, and Logo-based computer learning environments in a hands-on setting, offering new technology skills, problem solving design challenges and field trips.

A number of mini-assignments and projects focused around cybersecurity issues. These included:

- Using Microworlds (a Logo based software package) to build an interactive and/or multi-media story that discusses different facets of cyberethics or cybersecurity. The final project should be "kid friendly" and interesting—while still getting "a message across".

- StarLogo — create a simulation illustrating the dangers of computer viruses on the Internet. Simulate computers with and without virus protection, and include variables such as aging of the virus protection, new viruses, and exponential growth of the viruses as they spread across the network.
- Cybersecurity "game" built in Excel
- Field trips to places such as National Institute of Standards and Technology (NIST) and the Cryptologic Museum (with accompanying career briefing).
  - **Cyber Security —Real World Threat and Solutions**
    Donna Dodson, Computer Scientist, Computer Security Division, Information Technology Laboratory

  - **NIST's Role in Forensics DNA** - Becky Hill, Research Associate, Biochemical Science Division, Chemical Science and technology Laboratory
  - **Radioactivity Group Participation in the Rad-Nuc Activitiy of the Department of Homeland Security** - Leticia Pibida, Physicist, Ionizing Radiation Division, Physics Labratory
- On campus computer forensic, geography department (GIS) and Office of Information technology (OIT) speaker
- Netsmartz speaker (from the National Center for Missing and Exploited Children)
- All rotate to internships with local companies (3 on campus in Tech incubator, 1 Netsmartz and others to local PG IT/IA companies. Out of the 7 --2 will go during school year in the spring, and all the others will participate during the following summer (2007). Time was based on convenience for the companies and/or request by student/parents/guidance counselors (i.e., many parents did not want their child missing class during the school year).

## *Course Outline*

| Day | Week 1 | Week 2 | Week 3 |
|---|---|---|---|
| Monday<br>7/10<br>7/17<br>7/24 | Session 1:<br>AM<br><ul><li>Welcome & Logistics</li><li>Overview</li><li>Introduction to MicroWorlds for multimedia creation</li></ul>PM<br><ul><li>Skill Development with MicroWorlds</li></ul> | Session 6:<br>AM<br><ul><li>Visit from NSA-hands on activity</li><li>Show and share MicroWorlds Products</li><li>Introduction to ICONS</li><li>Project Development</li></ul>PM<br><ul><li>Skill Development with ICONS</li><li>MicroWorlds Products</li></ul> | Session 11:<br>AM<br><ul><li>Campus Visit GEOG and GIS program</li><li>Introduction to LEGO Robotics</li></ul>PM<br><ul><li>LEGO Robotics Team Project Development</li><li>Robo Challenge 1 & 2</li></ul> |

| | | | |
|---|---|---|---|
| Tuesday<br>7/11<br>7/18<br>7/25 | Session 2:<br>AM<br>• Logo Skills Continued<br><br>PM<br>• Group Animated Story<br>• Group Challenges | Session 7:<br>AM<br>PM<br><br>• NIST | Session 12:<br>AM<br>• AT Lab<br><br>PM<br>• 21st Century Skills<br>• Stimulus Materials for e-portfolio<br>• Project Development |
| Wednesday<br>7/12<br>7/19<br>7/26 | Session 3:<br>AM<br>• Group Animated Story<br>• Group Challenges<br><br>PM<br>• OIT Guest Speakers- Amy Ginther & Andrea Goodwin<br>• Thinking about our MicroWorlds final projects<br>• Stimulus Materials for e-portfolio<br>• Simulation/Game Development in MicroWorlds | Session 8:<br>AM<br>• 21st Century Skills<br>• Stimulus Materials for e-portfolio<br>  o Adding video<br>  o Adding field trip pictures and reflections<br><br>• TappedIn Guest Speaker -Online<br>• Project Development<br><br>PM<br>• ICONS Project Development | Session 13:<br>AM<br>• 21st Century Skills<br>• Stimulus Materials for e-portfolio<br>• Project Development/Trial Presentations<br>• **Guest Speaker COE**<br><br>PM<br>• LEGO RoboticsTeam Project Development<br>• Robo Challenge 3 trials<br>• Team Project Trial Presentations |
| Thursday<br>7/13<br>7/20<br>7/27 | Session 4:<br>AM<br>• National Cryptologic Museum Field Trip<br><br>PM<br>• Open Lab Work Time | Session 9:<br>AM<br>• Squeak and StarLogo<br><br>PM<br>• ICONS Project Development<br>• Possible Campus Lab Visits<br>  o Wind Tunnel<br>  o Trufina<br>  o TAP | Session 14:<br>AM<br>• Lab Time<br><br>PM<br>• Lab Time<br>• Poster Session Preparation<br>• Post Assessment |
| Friday<br><br>7/14<br>7/21<br>7/28 | Session 5:<br>AM<br>• Skill Development with MicroWorlds™<br><br>PM<br>• Squeak and StarLogo<br>• Squeak and StarLOGO | Session 10:<br>AM<br>• 21st Century Skills<br>• Stimulus Materials for e-portfolio<br>• Project Development<br>• Visit from National Center for Missing and Exploited Children<br><br>PM<br>• ICONS Project Development | Session 15:<br>AM<br>• Lab Time<br>• Preparation<br>• Set Up<br><br>Lunch (Lunch provided for participants)<br>PM<br>• Presentation of Projects<br>• Conclusion |

### *Lessons Learned*

Although all students seemed interested in the program, they had different interpretations of "cybersecurity". The males attending the course (non NSF supported students) had a better idea of what the topic meant, while females thought it was like "CSI". After the course was completed, the NSF funded students (girls) had a better understanding about the available careers, and would consider the work, but many did not have a specific interest they wished to pursue. Their career goals tended to be wide, i.e., one student wanted to go into youth advocacy – and thus I worked with NetSmartz to create a IT/IA related internship that would focus on the NSF goals (careers in IT/IA) while blending the student interests in youth advocacy.

For next summer, we will start recruiting in November 2006 for the summer 2007 program. We wish to make the applications process more selective, and include applications on both the website and a distribution list. We intend to include a more standardized screening process in order to choose applicants who have a minimal understanding and desire to work in a technology field, if not cybersecurity itself. This choice is being made because it is difficult to match students to inter/externships, if the students don't have a minimal interest or understanding.
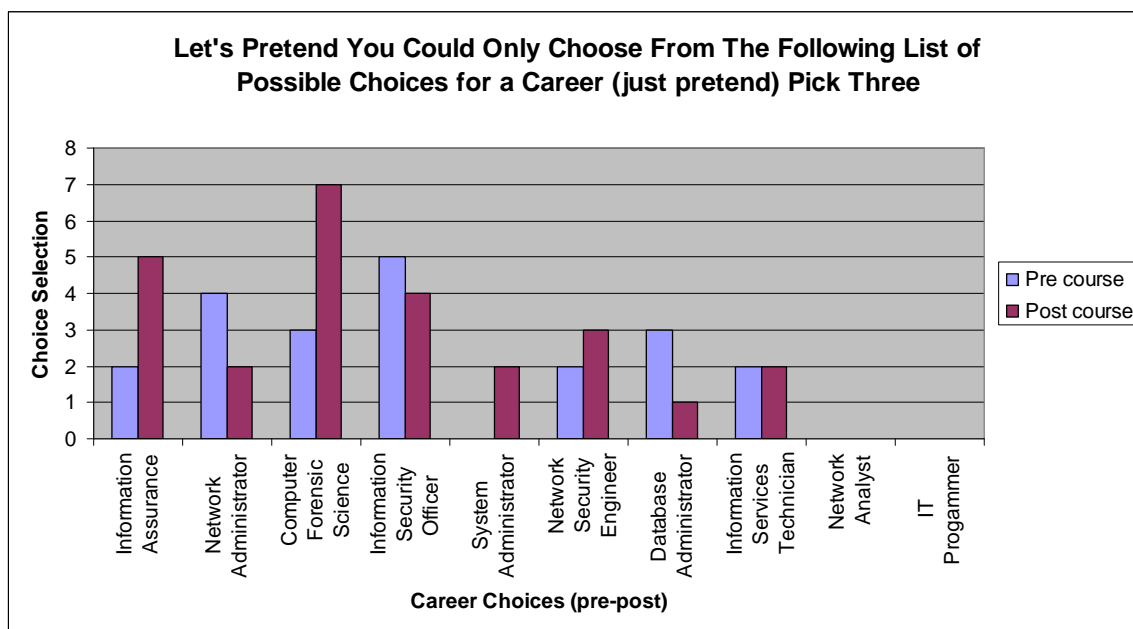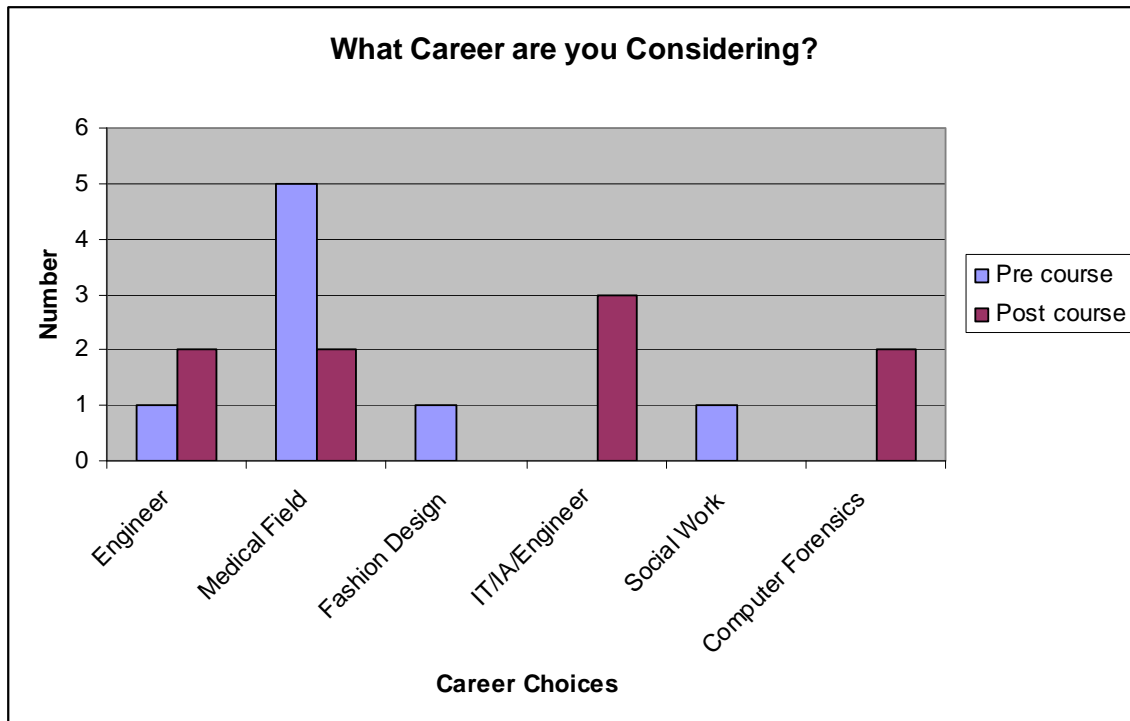
One student had to drop the course in week three due to family issues and has since moved from the state. Thus, she will not be able to participate in the internship/externship opportunity. Another student in the course who was not supported by NSF funds but whom is interested in this career field will replace this student in the internship experience.

Students supported by NSF funds received tuition remission but not the residential package. While they had the option to participate in the residential package, due to economic factors all were unable to take part in this option. The university understands the advantage of having the opportunity to live on campus and thus will be supporting all NSF funded students next year with the residential package. This will be supported by the Summer Programs unit.

## Summary Evaluations from the Attendees

| Evaluation and Feedback (0-4) 4 being the highest | |
| --- | --- |
| | |
| **General Questions** | **Average** |
| The course objectives were clear. | 3.6 |
| The length of the course was sufficient to cover the subject matter | 3.0 |
| Overall, the course instructors and speakers were effective. | 3.9 |
| I learned new information in this course. | 4.0 |

| | |
|---|---|
| I'd like to learn more about IT/IA and Cybersecurity | 3.4 |
| I may consider Cybersecurity as a career choice | 3.2 |
| **Speaker's Presentations** | |
| 0 - 4 scale, with 4 being strongly agree | **Average** |
| Andrea Goodwin Judicial Programs | 3.2 |
| Joan Upole NSA | 3.5 |
| National Cryptologic Museum Field Trip and Tour | 3.0 |
| Geog and GIS programs | 4.0 |
| NIST-Donna Dodson, Computer Scientist, Computer Security Division, Information Technology Laboratory | 2.9 |
| NIST-Becky Hill, Research Associate, Biochemical Science Division, Chemical Science and technology Laboratory | 4.0 |
| Leticia Pibida, Physicist, Ionizing Radiation Division, Physics Laboratory | 3.8 |
| Robert Maxwell, UMCP OIT Security | 3.5 |
| TappedIn Guest Speaker | 3.7 |
| GIS Ron Luna | 3.8 |
| Laurie Nathan<br>Outreach Coordinator, NetSmartz Workshop | 3.8 |
| Dan Newsome, UMCP AT lab | 3.2 |
| **Speaker's Presentations  Average** | 3.5 |

## What Career are you Considering?



| Career Choices | Pre course | Post course |
|---|---|---|
| Engineer | 1 | 2 |
| Medical Field | 5 | 2 |
| Fashion Design | 1 | |
| IT/IA/Engineer | | 3 |
| Social Work | 1 | |
| Computer Forensics | | 2 |

## Let's Pretend You Could Only Choose From The Following List of Possible Choices for a Career (just pretend) Pick Three



| Career Choices (pre-post) | Pre course | Post course |
|---|---|---|
| Information Assurance | 2 | 5 |
| Network Administrator | 4 | 2 |
| Computer Forensic Science | 3 | 7 |
| Information Security Officer | 5 | 4 |
| System Administrator | | 2 |
| Network Security Engineer | 2 | 3 |
| Database Administrator | 3 | 1 |
| Information Services Technician | 2 | 2 |
| Network Analyst | | |
| IT Progammer | | |

# How could this course be improved?

- Too much work
- Too much reading and work

- Would like to live on campus like others were able to do
- More time to visit with other researchers
- Being able to come to campus and see more throughout the year