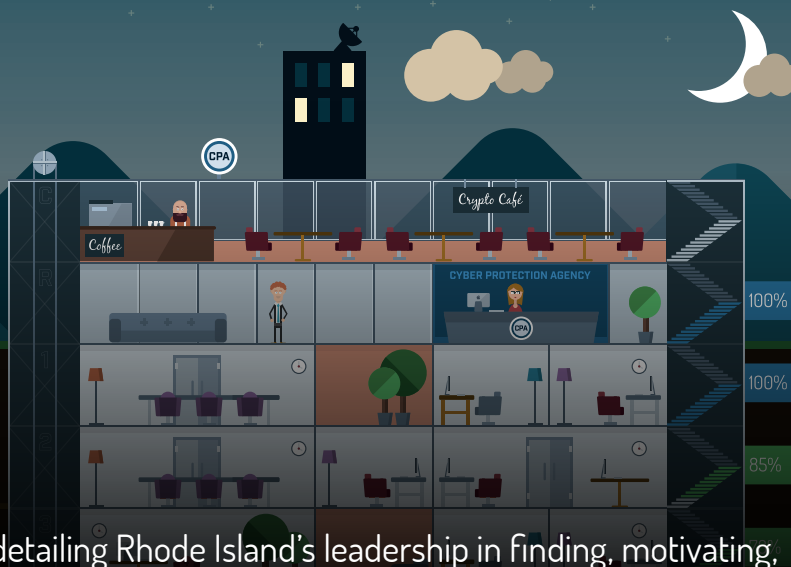


Rhode Island: Inspiring the next generation of cybersecurity experts

SANS



A report detailing Rhode Island's leadership in finding, motivating, and developing the cyber-capable workforce in the United States.

Dear Governor Raimondo,

Your insight and leadership in bringing CyberStart to the students of Rhode Island is already paying dividends for them in the form of learning and scholarships, and it can lead to future job growth and improved cybersecurity in Rhode Island. Results of the CyberStart pilot program are summarized below. But before you dig into the numbers and see the lists of high-performing Rhode Island students, please turn to the back cover of this booklet to enjoy personal notes that participating students wrote specifically for you.

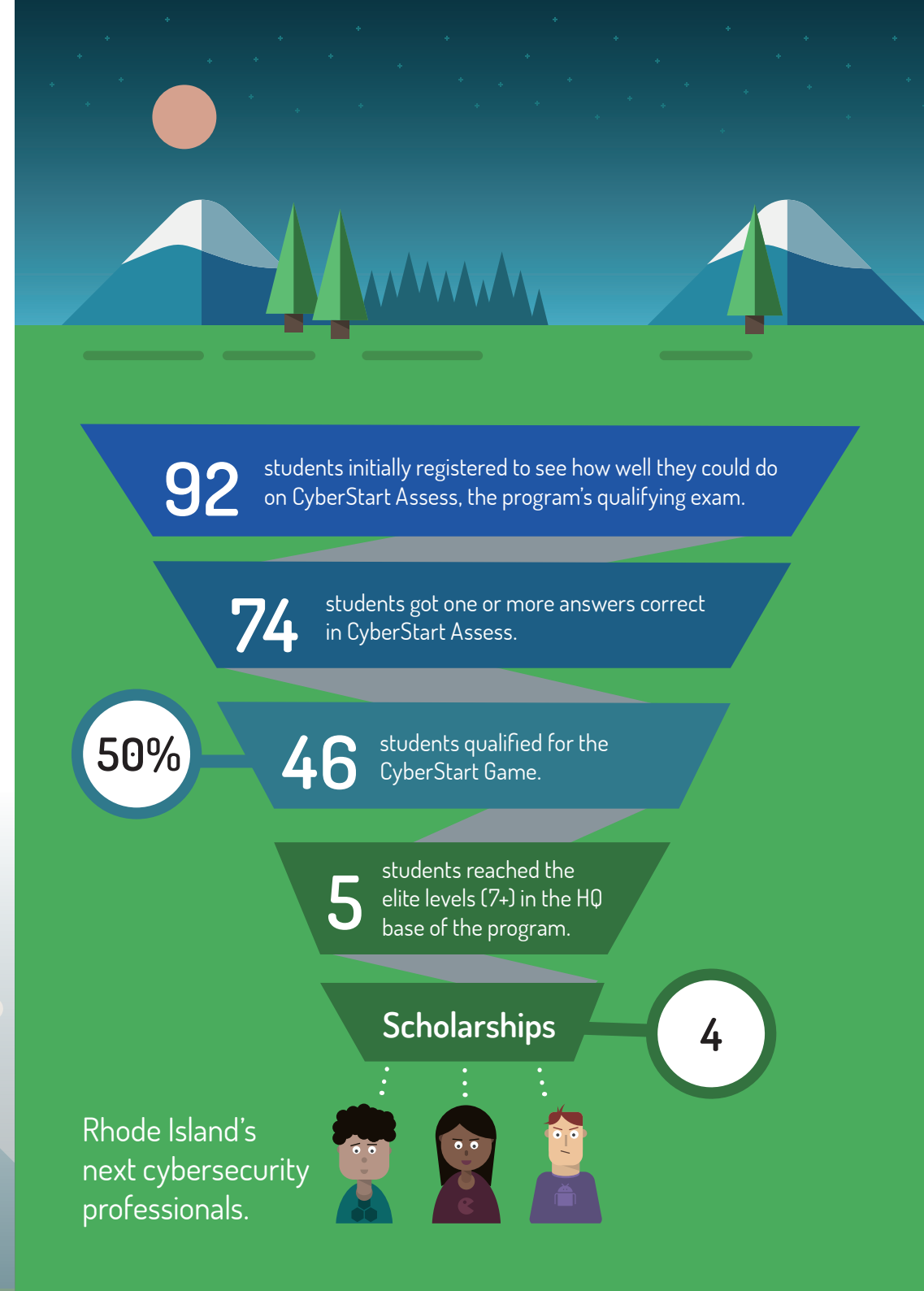
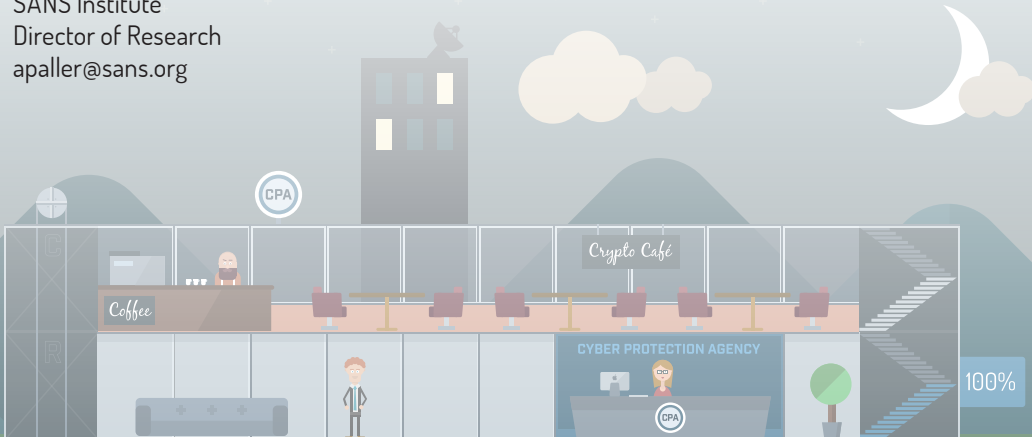
Program Highlights:

- In just two weeks in July, under the leadership of Christina Cosgrove, your team was able to sign up 92 Rhode Island students.
- 80% of them solved at least one of the assessment challenges and 50% solved enough to be invited to test their cyber aptitude on the 250+ challenges of the full CyberStart program, which they did during August 2017. At the same time your fellow governors in six states signed up a total of nearly 3,300 students.
- Two Rhode Island high school and college students were in the overall top 15 nationally, and four won scholarships for more advanced education in cybersecurity.
- As you might guess from the students' notes, they liked CyberStart:
 - 100% rated the game either excellent or very good (and this is a tough crowd!)
 - 100% said they would recommend the program to a friend
 - 83% are considering further cybersecurity training after the program

Please let me know if there is anything I can do to help as you continue to identify talent and grow the next generation of cybersecurity experts in Rhode Island.

Sincerely,
Alan Paller

SANS Institute
Director of Research
apaller@sans.org





Program Introduction

CyberStart is a forward-thinking skills program designed to supply specialist cybersecurity education to young people across the United States. Using a suite of online challenges, tools and games it aims to inspire the next generation of cybersecurity professionals while identifying the best and most talented young Americans.

We are facing a significant shortage of trained and skilled cybersecurity professionals at a time when online technologies continue to evolve, and cybercriminals are becoming more sophisticated. The only way to solve this problem is to introduce, develop and help young people in high school and college pursue a career in this sector.

Phases

CyberStart Assess is a set of 8 questions that test a student's aptitude and existing knowledge of computer security. Based on identifiable, measurable key skills and traits, it works to find young people who possess the innate qualities of an effective security practitioner. Questions look for traits such as problem solving, logical extrapolation and attention to detail, all of which have been proven to be crucial to succeed in a security career.

CyberStart Game is where students become exposed to specialist cybersecurity education. Using a suite of online tools, challenges and games, players attempt to solve more than 250 challenges, all of which are realistic examples of tests and threats faced by practicing cybersecurity engineers in their day-to-day lives. The CyberStart Game enables students to start studying security with challenges written by experts who practice these skills in the real world.

Goals

- Supply specialist cybersecurity education for 16+year olds.
- Inspire the next generation of cybersecurity experts.
- Grow the U.S. cyber capable workforce.
- Identify the most elite young talent.

What Do Players Learn?

The CyberStart Game has over 300 hours of content and covers 14 main topic areas. There are two "bases" that make up the game, each containing several levels and challenges that candidates move through: the Headquarters Base and the Moon Base.

Bases

The **Headquarters Base** forms the main part of the game. Players take on the role of a junior agent in the Cyber Protection Agency, where they deploy their forensics and offensive skills to sleuth through challenges and tackle various online cyber criminal gangs. As they work their way up through the organization, their training develops each of the security disciplines.

The HQ Base teaches students skills in:

- Binary
- Cryptography
- Forensics
- Linux
- Open-source intelligence
- Programming
- Web application

The **Moon Base** is where players learn how to program. Players go through a series of challenges, building up progressively, to write their own programs in Python. The aim of the Moon Base is for players to use all the skills they have learned to stop an alien invasion. The Moon Base has three training levels that are step by step guides to the basics of programming.

Later levels teach students skills in:

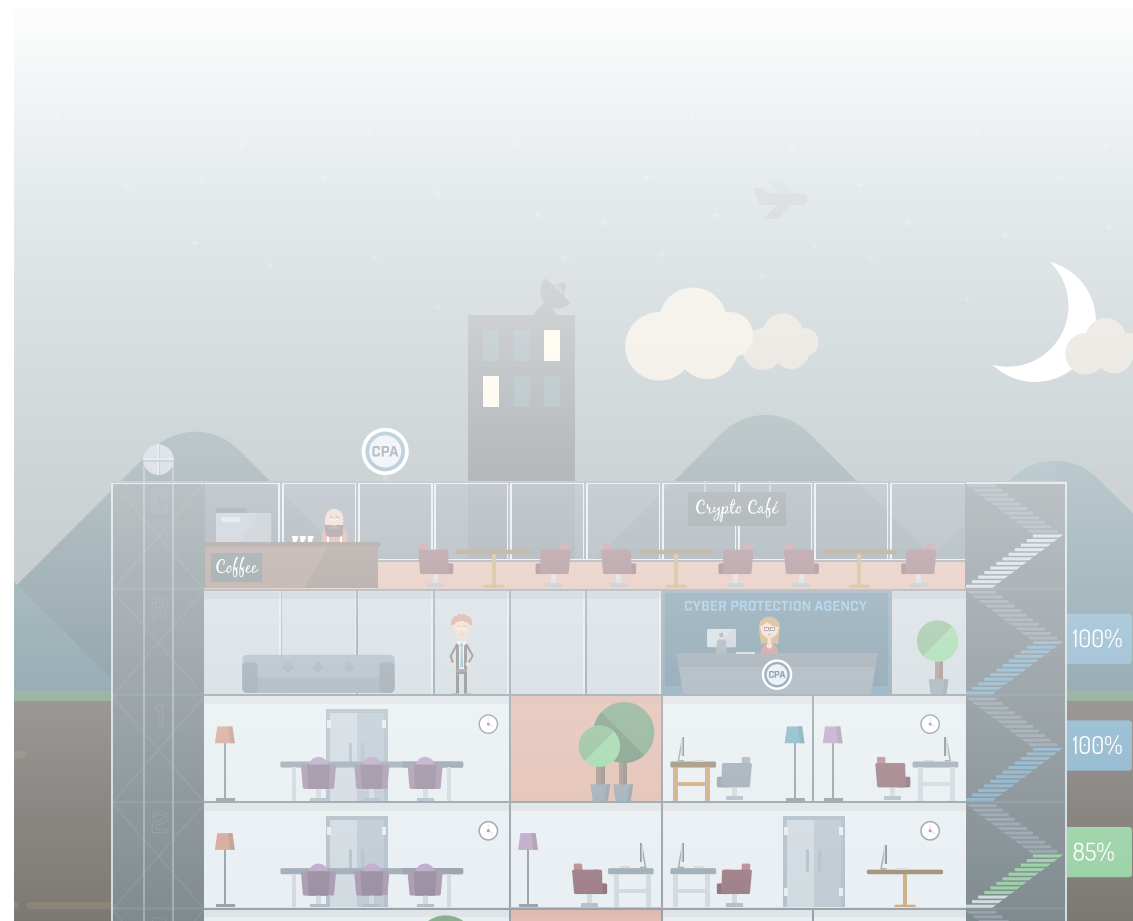
- Programming cryptography
- Debugging
- Files
- Functions
- Loops
- Sockets
- Strings

CyberStart Players in Rhode Island

Key	
**	In the top 100 and awarded a scholarship
*	Awarded a scholarship

Last Name	First Name	School	Top 100/ Scholarship
Andrade	Kyle	Portsmouth High School	
Armanious	David	Brown University	**
Bestoso	Alexander	Rogers High School	
Brissette	John	Community College of Rhode Island	
Chace	George	Community College of Rhode Island	
DeLong	Sam	East Greenwich High School	
Dias	Eli	Salve Regina University	
French	Oliver	Bryant University	
Galatzer-Levy	Mallory	Clark University	
Garcia	Rafael	Community College of Rhode Island	
Giordano	Frank L.	Community College of Rhode Island	**
Johnson	Devin	Salve Regina University	
Lopes	Sandra	Community College of Rhode Island	
Lopes	Scott	Boston University	*
Marchand	Nick	Community College of Rhode Island	
Nguyen	Kevin	Woonsocket High School	

Last Name	First Name	School	Top 100/ Scholarship
Pardington	Alexis	Community College of Rhode Island	
Perry	James	Community College of Rhode Island	
Picard	Codie	Community College of Rhode Island	
Siskin	Jared	Brown University	**
Smith	Parker	South Kingstown High School	
Theilig	Evan	Cranston High School East	
	Jake	Bryant University	



Strengths & Weaknesses

Strengths	
Headquarters Base	Moon Base
Binary	Strings
Programming	Loops
Linux	Cryptography

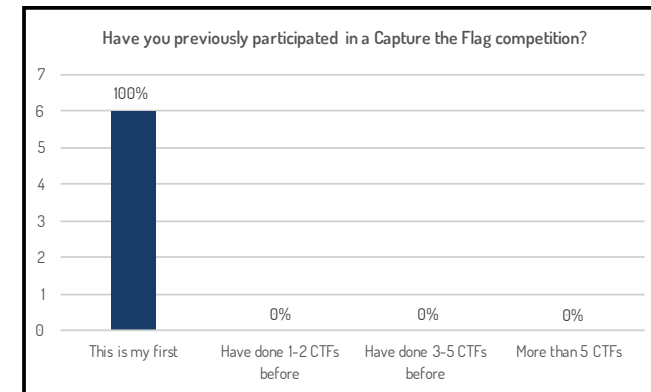
Weaknesses	
Headquarters Base	Moon Base
Forensics	Functions
Web application	Files
Cryptography	Debugging

The above tables show that Rhode Island students were strongest at binary challenges in the Headquarters Base and strings in the Moon Base.

The weakest topic in the Headquarters Base was forensics however, please note that weaker areas do not imply under achievement, merely that those areas provide opportunities to further develop.

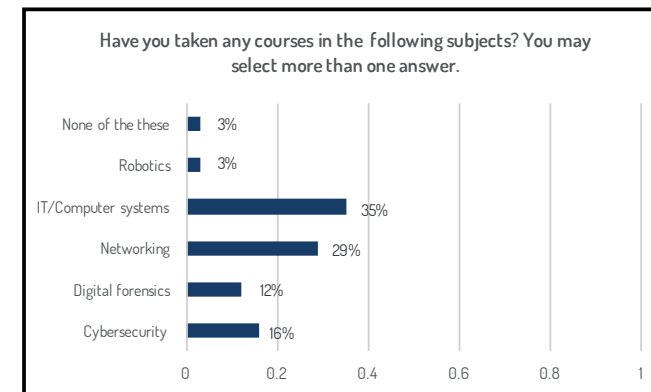
Student Feedback - Previous Knowledge

A survey sent to everyone who played the CyberStart Game asked players for feedback on their previous knowledge, what they had learned, and what they enjoyed most about the program.



These charts demonstrate that none of the students who played the CyberStart Game in Rhode Island had been exposed to a Capture the Flag style teaching method. Knowing this, it is encouraging that 50% of players made it through to the CyberStart Game.

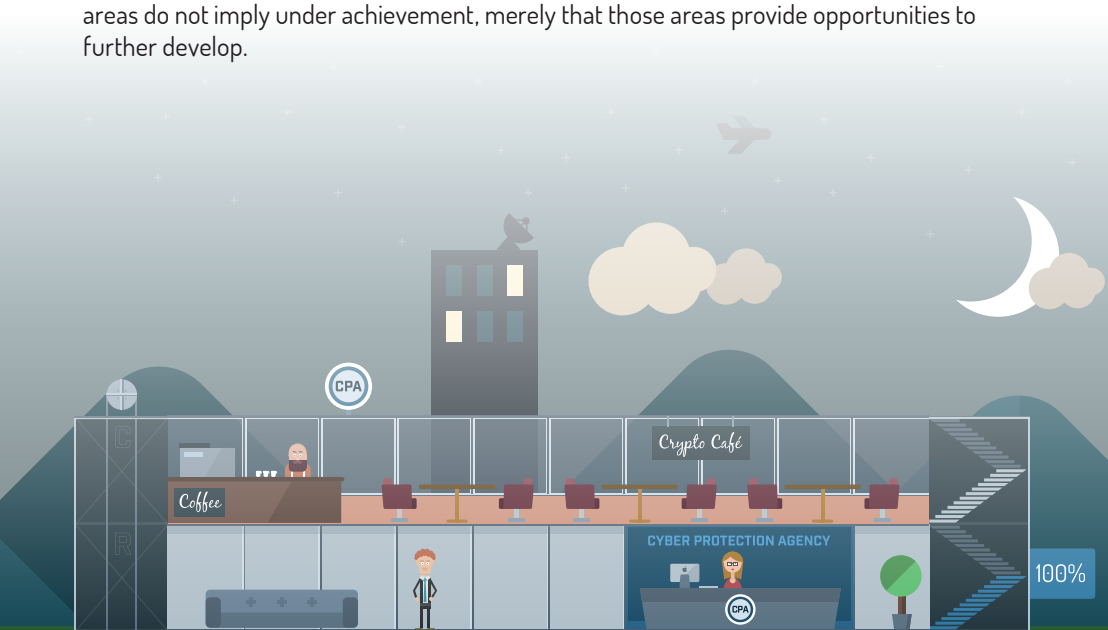
However, players from Rhode Island did have a variety of experience in other relevant cybersecurity subject areas - in particular computer systems. One of the benefits of the CyberStart tool is that it engaged with this group and developed their interest in cybersecurity. This in turn is likely to accelerate their entry into the profession and fast-track Rhode Island's next generation of cybersecurity experts.



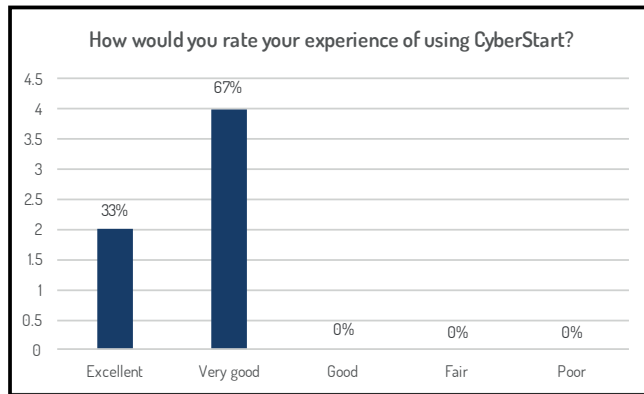
Example of Majors of CyberStart Participants:

- Cybersecurity
- Administration of Justice
- Algebra
- Computer science

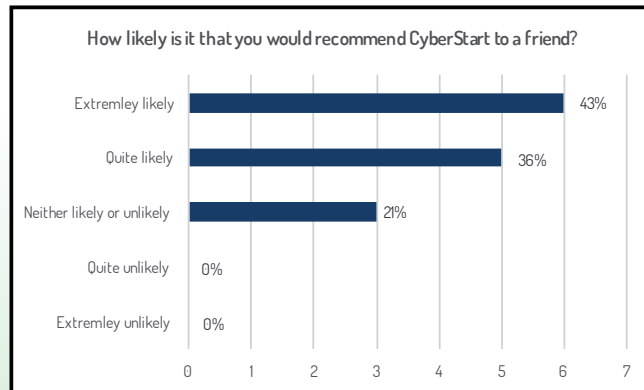
It is encouraging to see that students who had no previous experience were able to engage with the CyberStart tool and progress as well as students already interested in the industry and with a basic foundation of knowledge.



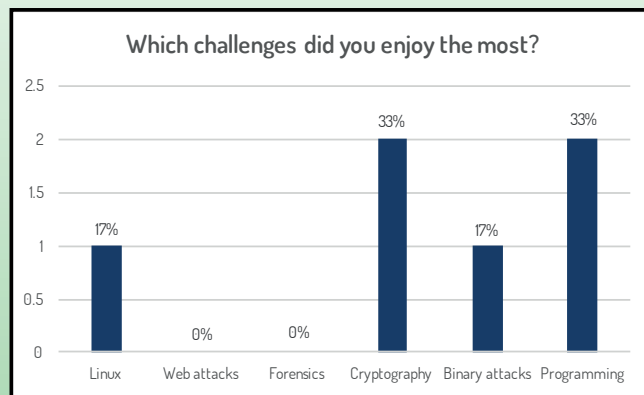
Student Feedback on CyberStart



The response to the tool has shown that the training and teaching in CyberStart has engaged the instinctive ways people learn and identified those who naturally think like a cybersecurity practitioner. These encouraging results reflect the enormous success of the program in engaging with a variety of ages, genders and skill level.

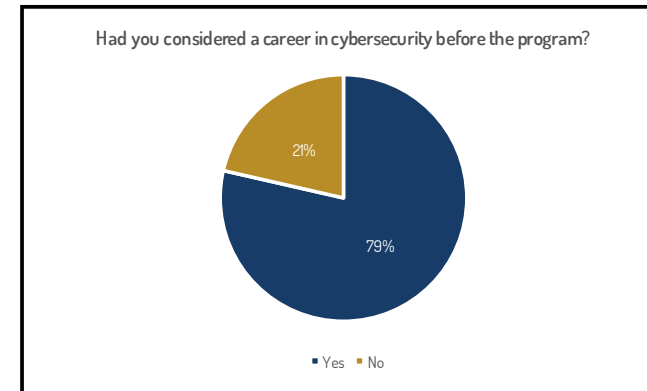


The students' response to the game has been exciting: 100% of students rated the game either "excellent" or "very good" and 79% said they would recommend the program to a friend. Not a single player rated the game below "very good" or said it was unlikely they would recommend it to a friend.



Students in Rhode Island were most engaged with cryptography and programming challenges.

Student Feedback on Career Impact



100% of students that answered "no" to considering a career in cybersecurity in the past are now considering further training.



The aim of the CyberStart program is to grow Rhode Island's cyber-capable workforce and promote cybersecurity as an exciting and recognized career. These graphs support our mission and present a group of young people who are now on the right path to a cybersecurity career.

Of the CyberStart participants in Rhode Island, 79% had previously considered a career in cybersecurity. After the program, this number increased and 93% of players are now considering further training. This is encouraging when looking at the future of cybersecurity professionals in the state.

After completing challenges in a variety of cybersecurity disciplines, the students that had never considered a career in cybersecurity before playing the CyberStart game, are now considering further training in the area. This is an exciting statistic which shows a real step change in reducing the skills gap in Rhode Island.

Is there anything you would like to say to the governor sponsoring the program?



"Thank you. This initiative has proven to be a great way to promote, educate and inspire the ever changing topic of cybersecurity."

Devin Johnson, Salve Regina University, College Senior

"This is an amazing program. Thank you for the opportunity to participate!"

Codie Picard, Community College of Rhode Island, College Sophomore



"This program was really fun, and I feel like it does a good job getting people interested in the field of cybersecurity. It definitely held my attention, and will definitely hold the attention of others."

Evan Theilig, Cranston High School East, Grade 11

"Thank you so much for the opportunity. I enjoyed trying to figure out codes and questions. I think it's a great way to teach and introduce people to cybersecurity with a game."

Sandra Lopes, Community College of Rhode Island, College Sophomore



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