2015 GenCyber Evaluation Report

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Executive Summary

Overall, the 2015 GenCyber program was very successful in meeting its goals. The intent was to have 286 teachers and 1397 students participate in the 2015 summer camps and the actual participation numbers were 240 teachers (83.91% of planned) and 1222 students (87.47% of planned). The program intended to reach a diverse set of teachers and students and appears to have done an excellent job in achieving this goal. Fifty five percent of the 240 teachers were female and 30% were minorities. Fifty percent of the student participants were female and 50% of the student participants were minorities.

The 2015 GenCyber teacher camp experience appears to be very successful based upon evaluation data collected from 217 students, a 90.41% response rate. The evaluation from the teacher camps finds participants reporting they strongly agree that they: 1) learned a lot about cybersecurity and computer science, 2) are very interested in cybersecurity, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) intend to integrate cybersecurity into their teaching, and 5) had a productive and enjoyable camp experience. Participants also report that they agree that they: 1) are interested in computer science, and 2) feel confident to integrate what they learned into the curriculum. Teachers report plans to reach 13,972 students with new curriculum in the 2015-16 academic year.

The 2015 GenCyber student camp experience appears to be very successful based upon evaluation data collected from 1035 students, an 84.70% response rate. The evaluation from the student camps finds participants reporting they strongly agree that they: 1) had a productive and enjoyable camp experience, and 2) learned a lot about computer science. Participants also report agreement that they: 1) learned a lot about cybersecurity, 2) are interested in computer science, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) are very interested in cybersecurity, and 5) are more interested in pursuing a career in cybersecurity after attending the camp. The improved interest in pursuit of careers in cybersecurity is particularly in contrast to participants reporting that they neither agreed nor disagreed that they planned to pursue a career in cybersecurity before attending the camp.

While the overall program appears to be highly successful, the GenCyber philosophy is based upon continuous evaluation and improvement. The program succeeds when each individual camp succeeds. An integral purpose of this Evaluation Report is to present actionable lessons learned and best practices for incorporation into future years of the program. The evaluation concludes with the following best practices and recommendations for improvement:

Teacher Camps:

- Articulate achievable learning goals and then plan instruction to achieve them.
- Provide sufficient time to practice with hands on and active learning.
- Carefully balance lecture with active learning.
- Help learning scaffold knowledge by accounting for incoming knowledge, and providing contextual explanations.
- Better balance course duration, as shorter camps can be effective for exposing teachers to the area but are less well suited for preparing them to transfer what they learn into their curriculum.
- Outline goals for curriculum transfer and ensure there is time at camp to work on this.

Student Camps:

- Make effective use of hands on learning. Students thrive on active learning material, and learning with their peers.
- Make good use of time. This does not mean cramming 8 weeks of material into 1 week. While making camps longer is one way to make efficient use of time, camps also might want to try and cover less material in a single year and begin thinking about multi-year or year round camp experience.
- Make material relevant to learners to enhance their learning and increase their interest. Learners want to understand *why* something is the case, know how to use their knowledge to make sense of and contribute to the world, and attach their learning to their future plans.
- Demonstrate a commitment to and interest in students' learning
- Make strides to create a camp environment that fosters a community where learners feel included, wanted, and valued.
- Present a well-organized physical environment that is conducive to the size and activities of the camp.

Introduction

The year 2015 continues an expanded proof of concept demonstration for the GenCyber initiative, a jointly-funded National Security Agency (NSA) and National Science Foundation (NSF) program that provides summer cybersecurity camp experiences for students and teachers at the Kindergarten through twelfth grade (K-12) level. The vision for the GenCyber program is to be part of the solution to the Nation's shortfall of skilled cybersecurity professionals. Specifically, as the nation becomes increasingly more reliant on cyber-based technology in every aspect of daily life, ensuring that enough young people are inspired to direct their talents into cybersecurity-related fields is critical to the future of our country's national and economic security. The goals of the GenCyber initiative are to: (1) create a diverse, world-class cyber workforce pipeline for the Nation by engaging students beginning with K-12; (2) influence K-12 institutions to instill Cyber Security First Principles and secure programming practices as part of their curricula; and (3) instill in students an awareness of cyber threats and vulnerabilities and appropriate behavioral responses to mitigate them.

The purpose of this 2015 GenCyber Evaluation Report is two-fold and includes assessing the impact of the program in achieving its goals and facilitating actionable feedback, lessons learned, and best practices to leverage in the enhancement of future years of the initiative.

Summary of 2015 Camps

Colleges and Universities submitting proposals for 2015 GenCyber camps were given a number of requirements that meet the intent of the overall initiative. Specifically, they were required to develop and implement camps that address the goals of the program, incorporate hands-on application of cybersecurity first principles, and support the participants at no cost. All those accepted into GenCyber camps must be United States citizens.

As compared with 2014, awareness of and participation in the GenCyber initiative has grown significantly amongst colleges, universities, students, and teachers. Within just one year, its reach has expanded from 256 students and 25 teachers participating in 6 residential and non-residential camps hosted by 6 universities to 1222 students and 240 teachers participating in 42 residential and non-residential (including online-only) camps hosted by 29 universities in 18 states. Of these 29 universities, 5 GenCyber camps held in 2015 were hosted by schools that participated in 2014. This year's camps were comprised of a wide range of students and teachers of diverse ethnicities, interests, past cyber experience, and abilities. Student participants ranged from 6th grade through incoming freshmen in college, while teacher participants ranged from 3rd grade through college. A number of camps targeted girls as an underrepresented demographic within Science Technology Engineering and Math (STEM), including a Girl Scout™ camp at University of Cal State San Bernadino and girls-only camps hosted at Dakota State University, Towson University, and Mississippi State University, while others such as the University of Alaska are represented by a large Alaska Native demographic. Towson University was provided online-only instruction using the NSF-sponsored Remote Access Virtualized Environment (RAVE). Other camps targeted teachers in joint or consecutive student-teacher camps, which will undoubtedly serve as a force multiplier in educating our next generation of cybersecurity experts. Teachers represented a wide range of subjects such as current and prior science, math, and even home economics. The names of the 2015 GenCyber teacher and student camp host universities and colleges follow.

Teacher Camps

- James Madison University
- Missouri University of Science and Technology
- New Mexico Institute of Mining and Technology
- Pace University
- Rochester Institute of Technology
- University of Alabama at Huntsville
- University of Hawaii
- University of New Orleans
- Virginia Polytechnic Institute and State University

Student Camps

- California State University San Bernadino
- Dakota State University (2 camps)
- Georgia Regents University (2 camps)
- Honolulu Community College
- Marymount University (2 camps)
- Mississippi State University (4 camps)
- Norwich University
- NYU (3 camps)
- Rochester Institute of Technology (2 camps)
- Towson University
- University of Florida Gainesville
- University of New Mexico
- University of South Alabama
- Worcester Polytechnic Institute

Teacher and Student Camps

- California Polytechnic State University Pomona
- Lake Superior College
- St. Cloud State University
- SUNY Buffalo
- University of Alaska
- University of Arizona (2 camps)
- University of California Berkeley
- University of South Alabama (2 camps)

Individual 2015 GenCyber camp sessions ranged from several days to 8 weeks and covered a wide range of objectives and topics relating to instruction and curricula for Information Assurance, security fundamentals, programming, social engineering, digital forensics, malware analysis, vulnerability analysis, networking, mobile security, encryption, reverse engineering, stenography, firewalls, electronic voting, digital cash, and privacy. Camp directors invited a diverse group of presenters from national research laboratories and industry to discuss job opportunities and reinforce real-world application of the concepts taught, and a few camps had graduate and CyberCorps® Scholarship for Service (SFS) recipients provide instruction and mentorship to camp participants. Instructional concepts were reinforced with hand-on labs, and participants utilized various software and technologies such as virtual machines, Raspberry Pis™, Wireshark™, Kali Linux™, Forensics Tool Kit (FTK)™, IDA Pro™, Java™, C++, RAVE, etc. In order to collaborate and communicate outside of the classroom, students and teachers leveraged social networking sites to host discussions. At the conclusion of many camps, hosts provided the attendees with Google™ Chromebooks™, Raspberry Pis™, iPad minis™, instructional material, etc., that will allow the students and teachers to continue to practice and to assist teachers in providing instruction in the classroom for their students. Please note that takeaway devices provided to participants were, in most instances, provided with funding from non-Government sources. All camps provided certificates of completion to their participants, and some even provided continuing education credits and college credit for attendance, where applicable.

National recognition of the GenCyber initiative continues to grow, and to date, there has been over 107 articles posted by news organizations, universities, and bloggers relating to GenCyber; and, the current number of students estimated to be impacted by K-12 teachers participating in the program is estimated at approximately 14,000.

Evaluation Overview

The purpose of this evaluation is to provide results on the extent to which the 2015 summer camps individually and collectively fulfilled the goals and intent of the program. Information presented within this comprehensive 2015 GenCyber Evaluation Report is compiled using data gathered from four distinct perspectives: (1) end-of-camp surveys from teacher and student camp participants; (2) pedagogical reviews from educational experts; (3) camp site visits from government representatives; and (4) final reports from camp directors. These data will serve to establish a baseline from which future renderings are evaluated. Table 1 below shows the metrics and data that were collected. The remainder of the report provides a summary of methodology and findings.

Table 1: Goals, Metrics and Data 2015 Evaluation

Goals	Metrics	Data	Sources
1. Create a diverse, world-class cyber workforce pipeline for the Nation by engaging students beginning with K12	a. 2015 Baseline Gender, Race, SES (middle school/high school) of all student participants b. Student Interest c. Teacher gender and race	a. Number and percentage of participants by gender, race and SES b. Increase/decrease in interest along with attribution	Camp Director Reports End-of-camp surveys
2. Influence K-12 institutions to instill Cyber Security First Principles and secure programming practices as part of their curricula	a. Plans for implementing materials in curriculum b. Information on how actual curricula was implemented	a. Number of units to be implemented, extra-curricular plans, subject matter, number of weeks, number of students to be affected, institutional support (info on biggest help/ biggest barriers to implementing curricula b. Recommendations, best practices, camp experiences, highs and lows.	Final reports (to be updated with additional material about actual implementation 6-9 months after camp completion) Site surveys
3. Instill in students an awareness of cyber threats and vulnerabilities and appropriate behavioral responses to mitigate them.	a. Effectiveness of teaching/learning process.	a. Learning environment b. Instruction/ Learning Time on Task, Use of Prior Knowledge, etc.	Pedagogical checklists

Methodology

The evaluation is a descriptive evaluation that uses mixed methods. The goal of this evaluation is to 1) describe the population of participants, 2) report on the end-of-camp variables[1] presented in tables 2 and 3 for all camps combined (the program) and each camp individually, 3) assess the effectiveness of teaching and learning practices using the variables presented in tables 2 and 3 using pedagogical reviews (template in Appendix C) and site surveys (template in Appendix D), and 4) identify best practices using camp director reports (template in Appendix E). Data were collected through observations and surveys. The GenCyber scale was developed with ten subscales on the teacher surveys and eleven subscales on the student surveys as shown in table 2. The survey used a 5-point Likert scale, where 5 is strongly agree and 1 is strongly disagree. The pedagogical observation protocol used three subscales listed in table 3.

Table 2: End-of-Camp Survey Variables

Variable	Teacher	Student
Learning Enjoyment and Desire	X	X
Learning Computer Science Enjoyment and Desire	X	X
Learning Cybersecurity Enjoyment and Desire	X	X
Interest	X	X
Interest Cybersecurity	X	X
Interest Computer Science	X	X
Self-Efficacy[2]	X	X
Camp Experience	X	X
Teaching Confidence (teacher survey only)	X	
Teaching Intention (teacher survey only)	X	
Pre Camp Career Intention		X
Post Camp Career Intention		X
Pre-Post Career Intention		X

Table 3: Pedagogical Checklist Variables

Focus on Learners and Relevance
Instructional Practice and Strategies
Environment and Culture

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[1] Survey questions are provided in Appendix A. A matrix of the variables by survey question is provided in Appendix B. The pedagogical checklist is provided in Appendix C, site surveys in Appendix D, and camp director reports at Appendix E.

[2] Self-efficacy is the extent or strength of one's belief in one's own ability to complete tasks and reach goals.

Findings

Teacher Camp Findings

The teacher camps offer a unique opportunity to provide awareness and professional development to teachers that will act as a force multiplier. For every teacher who attends a GenCyber camp, several students will potentially be exposed to new curriculum. The end-of-camp survey asked teachers to report how many students they expect to expose to cybersecurity content in the 2015-2016 school year as a result of participating in GenCyber. The projections provided by teachers who attended GenCyber camps indicate a potential impact to 13,972 students, which gives the 2015 GenCyber program a force multiplier of 1 to 58. In the spring of 2016 we hope to more definitely collect students reached via the 2015 GenCyber teacher attendees.

Population of Participants

Of the original 286 teachers provisioned for by GenCyber in 2015, a total of 240 teachers attended, which is 83.91% of planned participation. Figure 1 shows planned participation and total attendance by camp. Note, three camps had more teachers than planned: Cal Poly Pomona, SUNY Buffalo, and University of Alabama Huntsville. Below, tables 4 and 5 provide a summary of the teacher participant data by camp and include information on diversity (gender and race/ethnicity). As indicated, approximately 55% of teacher participants were female and approximately 29% represented minority races or ethnicities or preferred not to disclose.

Figure 1: Number of Participants by Camp
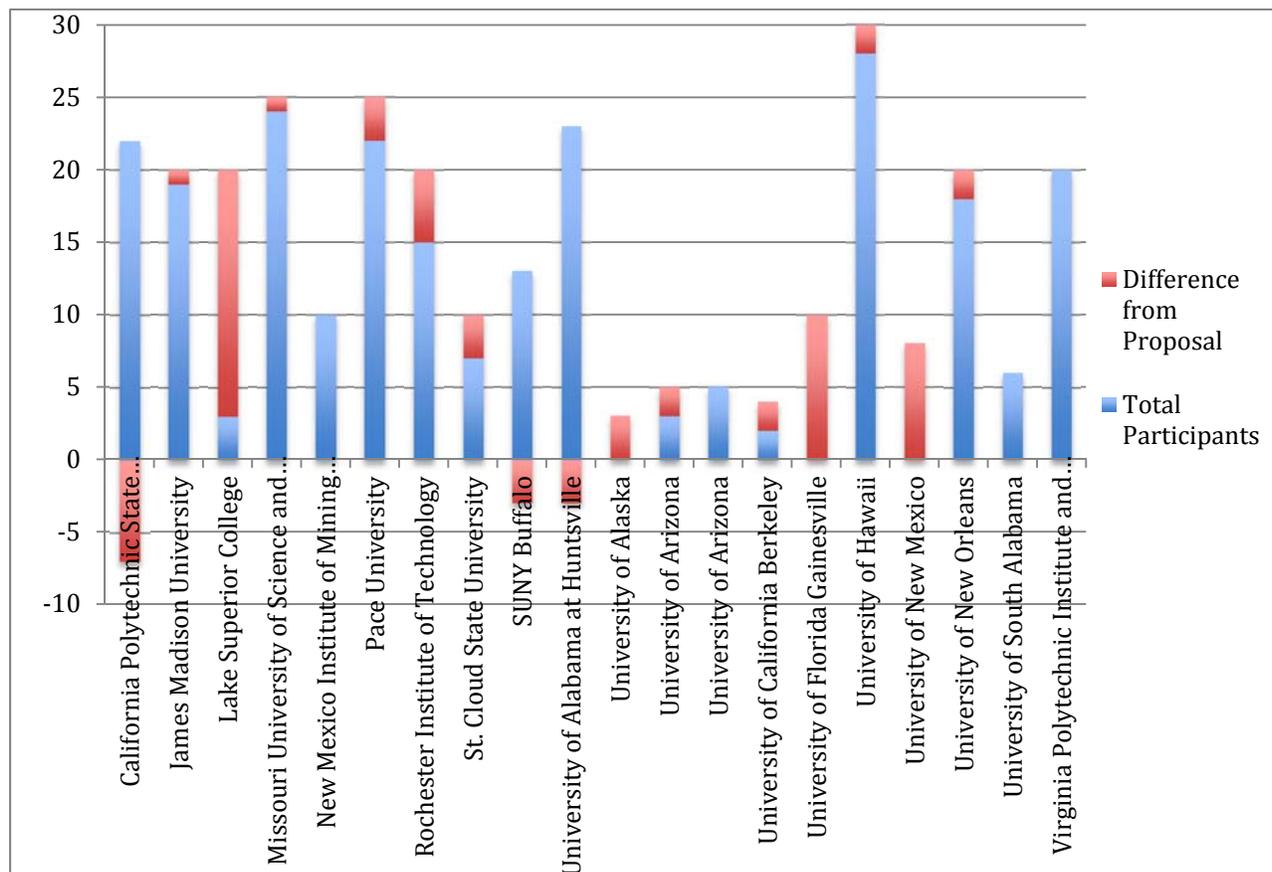
Table 4: Teacher Participants by Gender

Total	240	100.00%
Female	132	55.00%
Male	108	45.00%
Prefer to Not Disclose	0	00.00%

Table 5: Teacher Participants by Race/Ethnicity

| Total	240	100.00%
Caucasian	170	70.04%
Hispanic/Latino	12	5.00%
African American	21	8.75%
Asian	25	10.42%
Native American/Pacific Islander	4	1.67%
More than 1 Race	1	.42%
Other	3	1.25%
Prefer to Not Disclose	4	1.67%

Survey

Response Rate

Two hundred and seventeen of the total 240 teacher camp participants completed the end-of-camp survey, which represents a response rate of 90.41%. Table 6 below shows attendance and survey responses by camp. Figure 2 is a graph of the response rate by camp.

Table 6: Teacher Camp # of Attendees and Survey Responses by Camp

| Camps	# of Attendees	# Completed Surveys
Cal Poly Pomona	22	22
James Madison University	19	19
Lake Superior College	3	3
Missouri University ST	24	24
New Mexico Tech	10	6
Pace University	22	22
Rochester Institute of Technology	15	15
St. Cloud State University	7	7
SUNY Buffalo	13	12
University of Alabama Huntsville	23	20
University of Arizona 1	5	4
University of Arizona 2	3	3
University of California Berkeley	2	2
University of Hawaii	28	14
University of New Orleans	18	18
University of South Alabama 1	3	3
University of South Alabama 2	3	3
Virginia Tech	20	20
Total	**240**	**217**
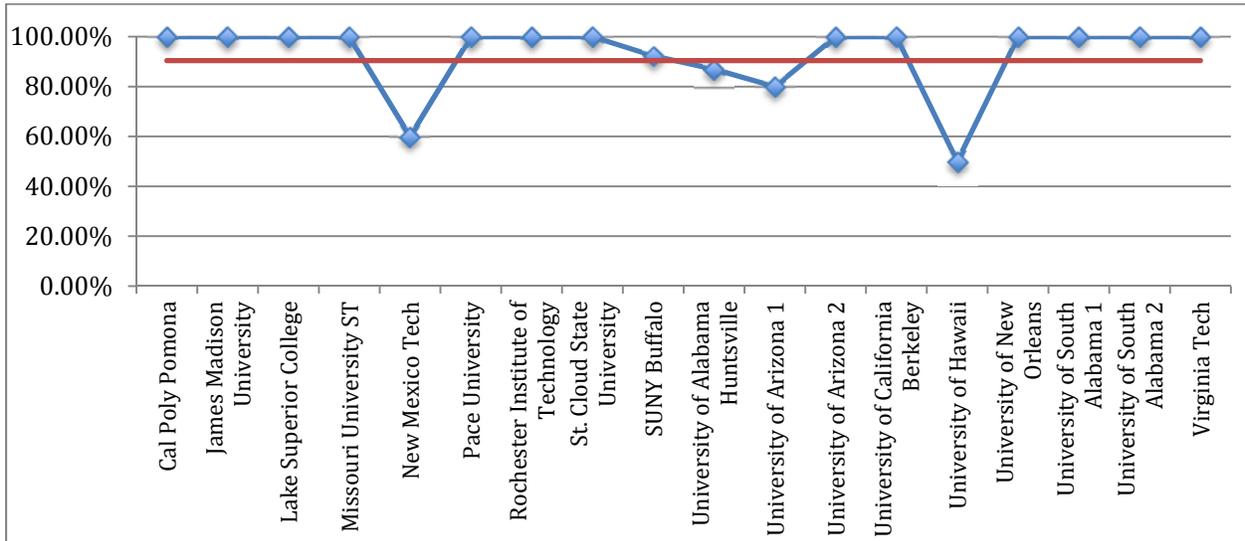
Results by Variable

Figure 3 shows the aggregated descriptive statistics for all teacher camp surveys sorted by mean score from highest to lowest. The highest rating is learning enjoyment and desire of cybersecurity at 4.67 with a standard deviation of .66 while the lowest rating is teaching confidence at 4.05 with a standard deviation of .73.

The 2015 GenCyber Teacher Camp program appears to be **overall very successful** with participants reporting they **strongly agree** that they: 1) learned a lot about cybersecurity and computer science, 2) are very interested in cybersecurity, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) intend to integrate cybersecurity into their teaching, and 5) had a productive and enjoyable camp experience. Participants also report that they **agree** that they: 1) are interested in computer science, and 2) feel confident to integrate what they learned into the curriculum.

Figure 3: Teacher Camp Survey Results by Variable
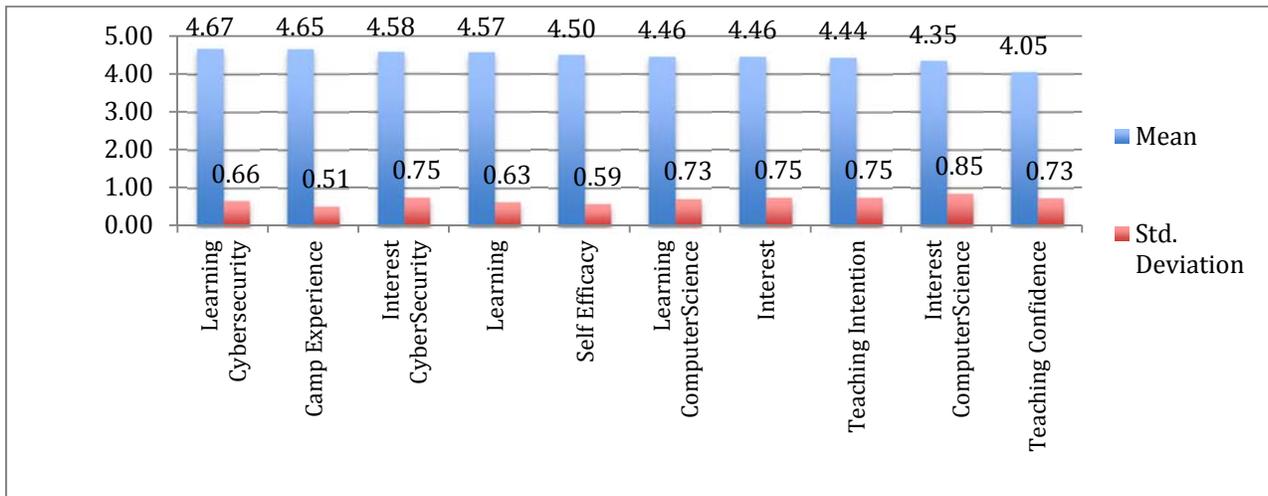
Results by Camp

Table 7 shows the mean score for each variable for all camps and for your camp.

Table 7: Variable Mean Score by Camp

Camps	Learning Enjoyment/Desire	Learning Computer Science	Learning Cybersecurity	Interest	Interest Cybersecurity	Interest Computer Science	Self-Efficacy	Teaching Confidence	Teaching Intention	Camp Experience
Average	**4.57**	**4.46**	**4.67**	**4.46**	**4.58**	**4.35**	**4.50**	**4.05**	**4.44**	**4.65**

Student Camp Findings

Population of Participants

Student Camps

Of the original 1397 students provisioned for by GenCyber in 2015, a total of 1222[3] attended, which is 87.47% of planned participation. Figure 4 shows planned participation and total attendance by camp. Note, four camps had more students than planned: Dakota State University Camp 2 (girl's camp), Marymount Camp 1, Mississippi State University High School Boys Camp, and Towson camp. Tables 8 and 9 below provide a summary of the student attendees that includes information on diversity (gender and race/ethnicity). As indicated, approximately 50% of student participants were female and approximately 50% represented minority races or ethnicities or preferred not to disclose.

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[3] Note that 1222 is the number for whom we have demographics reported. In some instances, this might not match the number of participants reported in the site visit report.
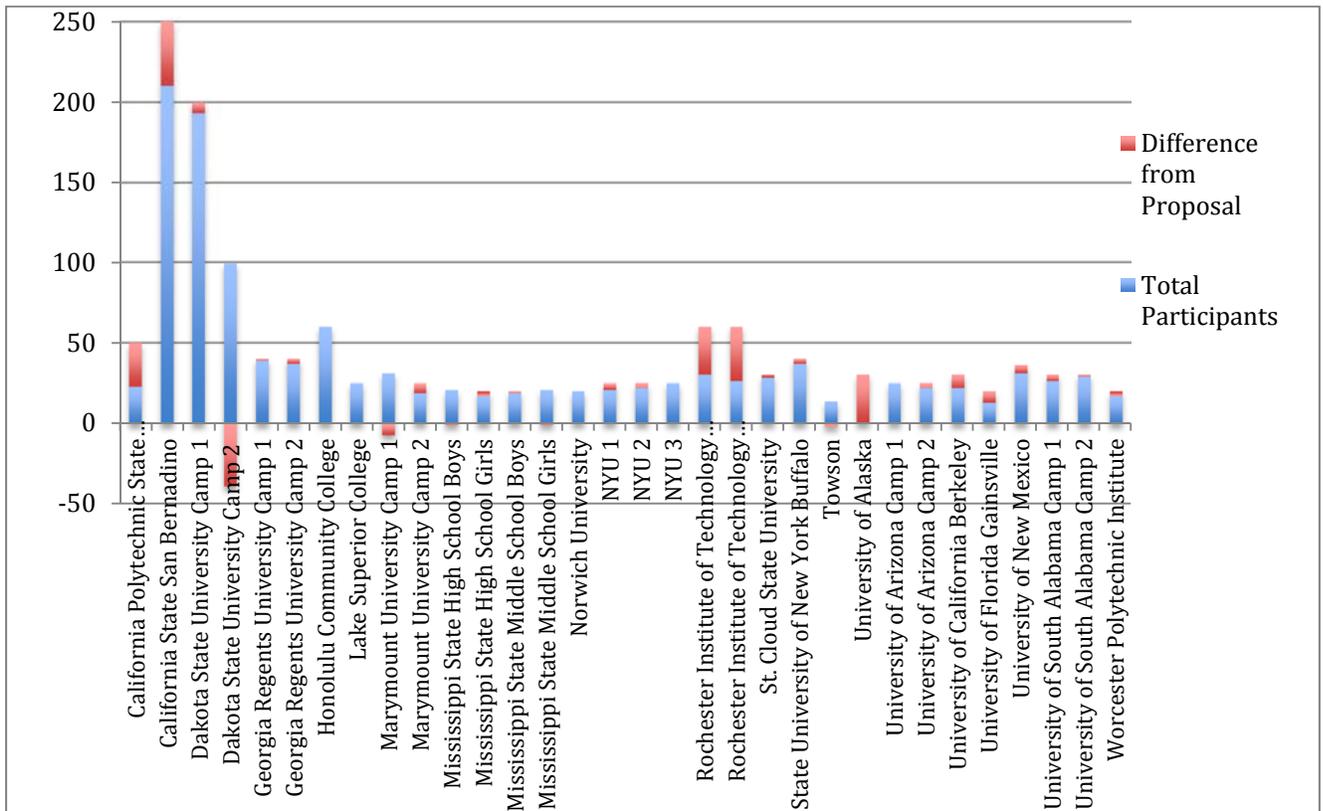
Figure 4: # of Participants by Camp

Table 8: Student Participants by Gender

Total	1222	100.00%
Female	618	50.25%
Male	602	49.59%
Prefer to Not Disclose	2	00.16%

Table 9: Student Participants by Race/Ethnicity

Total	1222	100.00%
Caucasian	612	50.08%
Hispanic/Latino	151	12.36%
African American	182	14.89%
Asian	144	11.78%
Native American/ Pacific Islander	31	2.54%
More than 1 Race	15	1.23%
Other	22	1.80%
Prefer to Not Disclose	65	5.32%

Survey

Response Rate

Of the total 1222 camp participants, 1035 students completed the survey, for a response rate of 84.70%. Figure 5 below is a graph of the response rate by camp. Table 10 below shows attendance and survey responses by camp.

Figure 5: Student Camp Response Rate by Camp
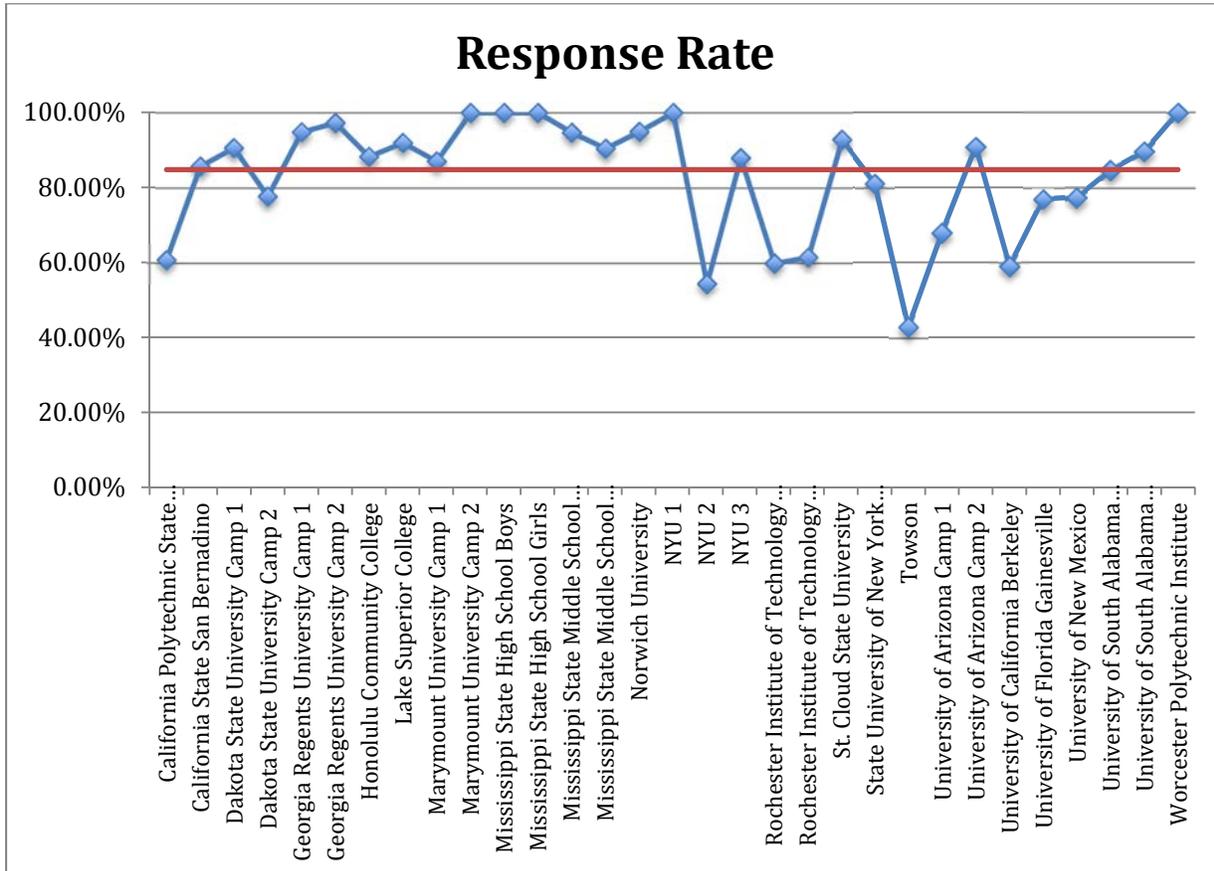
**Table 10: Student Camps # of Attendees and Survey Responses**

Camps	# of Attendees	# of Completed Surveys
California Polytechnic State University	23	14
California State San Bernadino	210	180
Dakota State University Camp 1	193	175
Dakota State University Camp 2	99	77
Georgia Regents University Camp 1	39	37
Georgia Regents University Camp 2	37	36
Honolulu Community College	60	53
Lake Superior College	25	23
Marymount University Camp 1	31	27
Marymount University Camp 2	19	19
Mississippi State High School Boys	21	21
Mississippi State High School Girls	17	17
Mississippi State Middle School Boys	19	18
Mississippi State Middle School Girls	21	19
Norwich University	20	19
NYU 1	21	21
NYU 2	22	12
NYU 3	25	22
Rochester Institute of Technology Camp 1	30	18
Rochester Institute of Technology Camp 2	26	16
St. Cloud State University	28	26
State University of New York Buffalo	37	30
Towson	14	6
University of Alaska		
University of Arizona Camp 1	25	17
University of Arizona Camp 2	22	20
University of California Berkeley	22	13
University of Florida Gainesville	13	10
University of New Mexico	31	24
University of South Alabama Camp 1	26	22
University of South Alabama Camp 2	29	26
Worcester Polytechnic Institute	17	17
Total	1222	1035

Results by Variable

Figure 6 shows the aggregated descriptive statistics for all student camp surveys sorted by mean score from highest to lowest. For the variable camp experience, the mean rating was 4.45 (the highest) and the standard deviation .60. The lowest rating was pre-camp intentions to pursue a career in computer science/cybersecurity at 3.37 with a standard deviation of 1.29. It should be noted that the post camp intentions to pursue a career in computer science/cybersecurity increased to 3.92 and the standard deviation decreased to .82.

The 2015 GenCyber student camp program appears to be **overall very successful** with participants reporting they **strongly agree** that they: 1) had a productive and enjoyable camp experience, and 2) learned a lot about computer science. Participants also report **agreement** that they: 1) learned a lot about cybersecurity, 2) are interested in computer science, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) are very interested in cybersecurity, and 5) are more interested in pursuing a career in cybersecurity after attending the camp. Overall, participants reported that they **neither agreed nor disagreed** that they planned to pursue a career in cybersecurity before attending the camp. The mean for pre camp interest in a career in cybersecurity was 3.37, and the standard deviation was 1.29 while the mean for post camp intention to pursue a cybersecurity career rose to 3.92 and less variance as represented by the standard deviation of .82. The improved interest in pursuit of careers in cybersecurity is particularly is notable. Pre-camp and post-camp career intentions are presented in greater detail starting on page 25.

Figure 6: Student Camp Survey Results by Variable
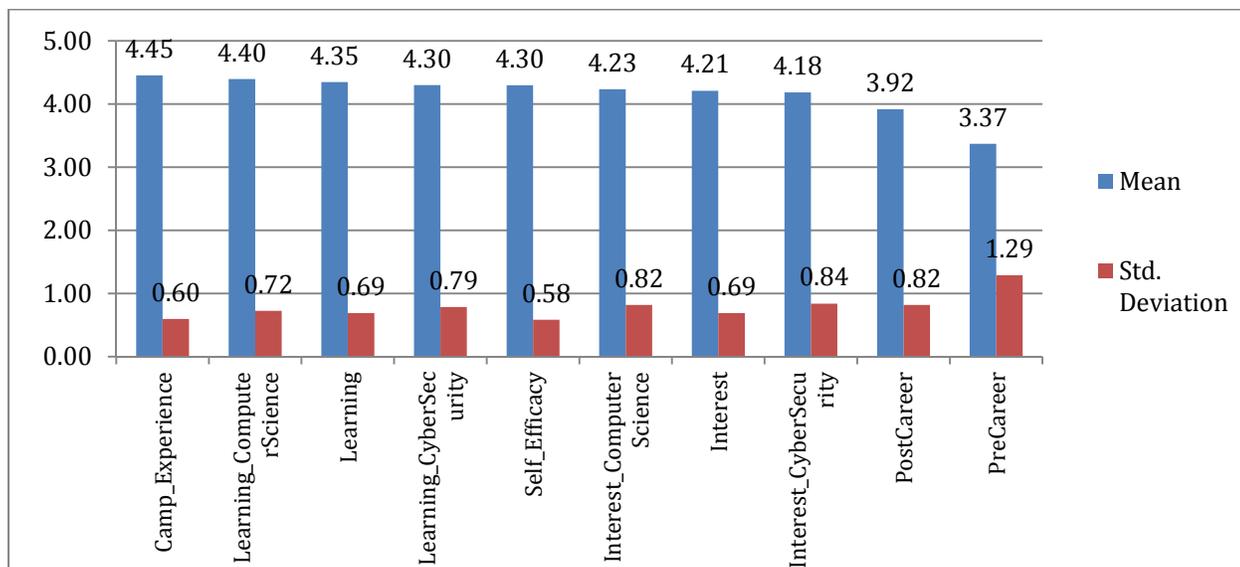

Results by Camp

Table 11 shows the mean score for each variable for all camps and for your camp.

Table 11: Variable Mean Score by Student Camp

	Learning Enjoy/Desire	Learning Comp Science	Learning Cybersecurity	Interest	Interest Cybersecurity	Interest Comp Science	Self-Efficacy	Pre-Career	Post-Career	Camp Experience
Average	**4.35**	**4.40**	**4.30**	**4.21**	**4.18**	**4.23**	**4.30**	**3.37**	**3.92**	**4.45**
Georgia Regents University Week 1	4.57	4.58	4.57	4.15	4.21	4.08	4.50	3.85	4.07	4.45
Georgia Regents University Week 2	4.60	4.61	4.59	4.19	4.19	4.16	4.37	3.59	4.01	4.37

Because of the noticeable change in career intention, we also ran paired t-tests on pre-camp and post-camp career intention for the all camps and for each camp. The difference was statistically significant where $t= -15.083$, $p=.000$. Figure 7 shows the pre-camp and post-camp career intention average for each camp. Also shown is the average rating for pre-camp intention to pursue a career in cybersecurity (red line in Figure 7, 3.37) and the average rating for post camp intention to pursue a career in cyberscurity (purple line in Figure 7, 3.92). The camps with a statistically significant (p=.05) difference between post-camp and pre-camp intention to pursue a cybersecurity are marked in yellow and orange. Note that some of the camps scored lower than the average on the pre-camp and/or post-camp career intention variable, yet have a statistically significant increase in post-camp intention to pursue a career in cybersecurity (e.g., Cal State San Bernadino, Dakota State Girls Camp, Mississippi State Middle School Girls Camp, and University of South Alabama).

Figure 5: Pre-camp and Post-camp Career Intention to Pursue Cybersecurity
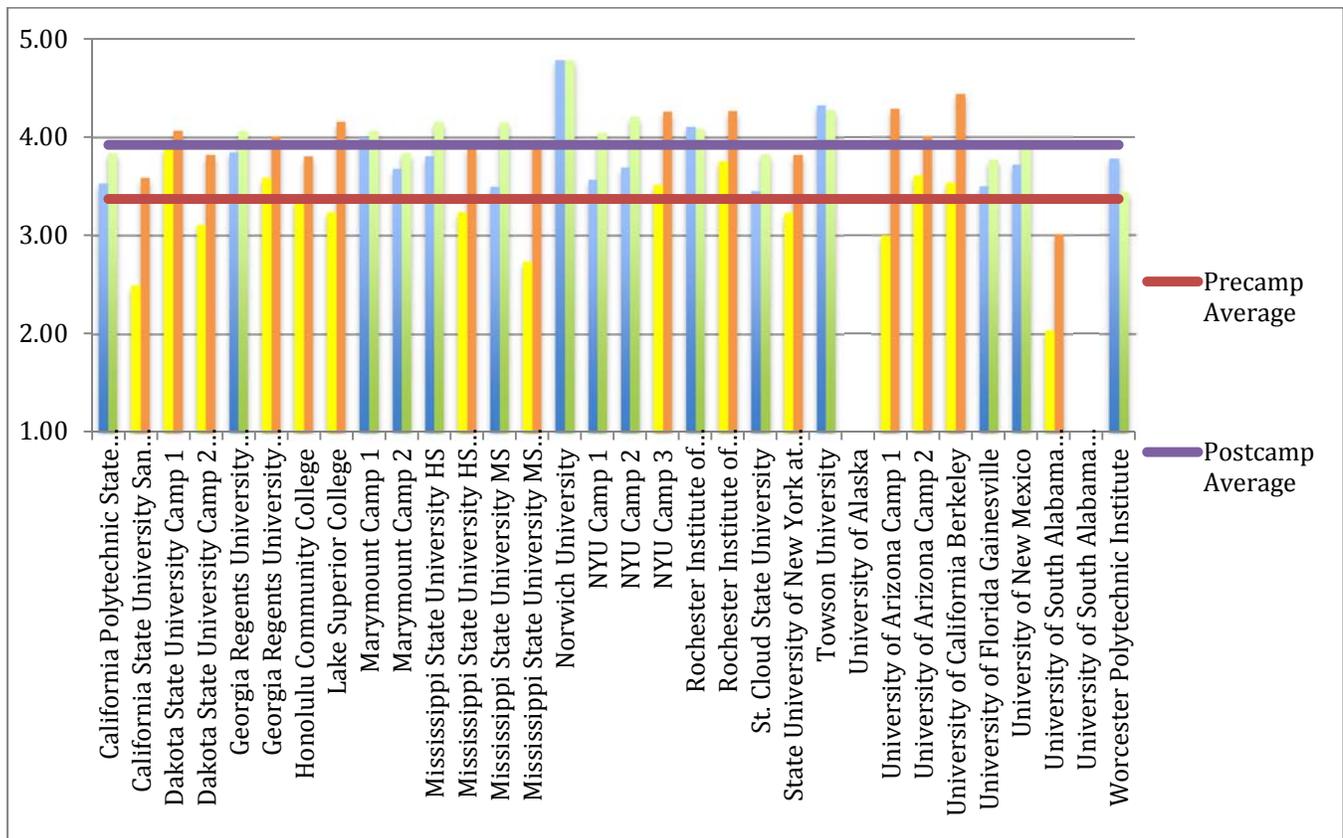
We investigated whether there were any statistically significant gender differences and found that several differences in scores can be attributed to gender of camp participants and not the camp per se. These are reported in tables 12 and 13.

Table 12: Descriptive Statistics for Girls Only, Boys Only, and Coed Camps

Gender		N	Minimum	Maximum	Mean	Std. Deviation
Girls only	Learning	363	1.00	5.00	4.2369	.68905
	Learning_ComputerScience	364	1.00	5.00	4.3091	.71482
	Learning_CyberSecurity	364	1.00	5.00	4.1662	.81175
	Interest	363	1.00	5.00	4.1194	.67795
	Interest_CyberSecurity	364	1.00	5.00	4.0522	.84633
	Interest_ComputerScience	365	1.00	5.00	4.1452	.82092
	Self_Efficacy	359	1.00	5.00	4.1704	.63945
	Pre-Career	364	1.00	5.00	2.8819	1.25081
	Post-Career	359	1.00	5.00	3.7762	.81254
	Camp_Experience	361	1.00	5.00	4.4685	.58169
Boys only	Learning	39	3.00	5.00	4.4167	.50437
	Learning_ComputerScience	39	3.50	5.00	4.6410	.41277
	Learning_CyberSecurity	39	1.50	5.00	4.1923	.79980
	Interest	39	3.33	5.00	4.3932	.51793
	Interest_CyberSecurity	39	2.00	5.00	4.1282	.89382
	Interest_ComputerScience	39	3.00	5.00	4.5897	.63734
	Self-Efficacy	39	3.00	5.00	4.2479	.58097
	Pre-Career	39	1.00	5.00	3.6667	1.17727
	Post-Career	39	3.00	5.00	4.1538	.57148
	Camp_Experience	39	3.71	5.00	4.7033	.39244
Co-ed	Learning	662	1.00	5.00	4.4026	.69452
	Learning_ComputerScience	664	1.00	5.00	4.4277	.73895
	Learning_CyberSecurity	662	1.00	5.00	4.3784	.76017
	Interest	640	1.00	5.00	4.2490	.70285
	Interest_CyberSecurity	663	1.00	5.00	4.2579	.82529
	Interest_ComputerScience	664	1.00	5.00	4.2605	.82195
	Self-Efficacy	649	2.33	5.00	4.3698	.53819
	Pre-Career	642	1.00	5.00	3.6293	1.24011
	Post-Career	636	1.00	5.00	3.9811	.82290
	Camp_Experience	654	1.14	5.00	4.4275	.61345

Table 13: Statistically Significant Differences between Girls Only, Boys Only, and Coed Camps

	Girls v. Boys		Boys v. Coed		Girls v Coed	
	t	p	t	P	T	p
Learning	-2.03	.047			-3.67	.000
Learning_ComputerScience	-4.37	.000	2.961	.005		
Learning_CyberSecurity					-4.09	.000
Interest	-3.03	.004			-2.87	.004
Interest_CyberSecurity					-3.76	.000
Interest_ComputerScience	-4.01	.000	3.08	.004	-2.16	.031
Self-Efficacy					-5.01	.000
Pre-Career	-3.93	.000			-9.14	.000
Post-Career	-3.74	.000			-3.80	.000
Camp_Experience	-3.36	.001	4.10	.000		

In reading the qualitative comments provided by students on the survey and by pedagogical site visitors, several themes emerged that help illuminate the differences among the groups. These themes are synthesized below in narrative and supported by a few illustrative quotes that were purposefully selected from a much larger set.

Instructional Strategies
One of the key differentiating factors in camps in the green category vs. yellow or red is the effective use of hands on learning. Repeatedly, students mention the best aspect of a camp being hands on learning, active learning, and effective use of interactivity during the learning process. Note that comments range from the opportunity to interact with others, to the opportunity to be physically more active, to interchanging of lecture with hands on more effectively. Conversely for camps rated less highly, students often mention that the camp had too much lecture and too little hands on. A few illustrative comments follow:

> "Spoon feeding in the long run teaches us nothing but the shape of the spoon"
> ~ E. M. Forster

Best Practice	Recommendations for Improvement
• My favorite thing about this camp was that it highlighted how important it is to have knowledge on both subjects of cyber security and computer science in current day. It highlighted the importance through not just having practice problems involving python but also through a variety of interactive activities that allowed me to work with both the other students and the camp's mentors. • The creative and interactive activities the teachers/faculty organized which made computer science/cybersecurity more interesting to learn! A few of my favorite activities were the interactive human network, the World Leader Summit, and of course, the Raspberry Pi! • Even though there were a lot of complex concepts, they broke it down into easy to understand segments and used really great metaphors to make it easier to relate to. • The hands on teaching of the classes • My favorite thing about this camp was that we got to use the actual tools and techniques used by professionals. • Using the skills we learned to solve daily challenges. • My favorite thing was the hands-on. • I liked that the camp was hands on and we got to use professional grade software. I enjoyed working with Kali Linux and Wireshark. The Raspberry pi setup was fun and I enjoyed it.	• There were not enough hands on activities. • Long lectures • The dragging on of the teachers somewhat. • This camp would be better if there are more interactive activities. • We did more activities that involve computer science and more information on cyber security. • Need more activities and making things with our hands. • They could've made some of the classes more interactive with students, but it's okay, I still liked it!!!! • I disliked that the whole class sessions we were sitting down in our seats. • Some of the instructor's presentations. I would rather be taught while doing the labs. • The lessons taught by the teachers, generally at 12:30 in the afternoon, where they introduced concepts of information and cyber security were... mediocre. I would have liked for them to go into more depth about how these concepts specifically affected the security and protection of networks, and accept more questions. • This camp would be better if I never looked at a computer screen all day. • How the morning was all lectures and the afternoon was all lab. Maybe you should mix labs and lectures together so students don't lose focus. • That when doing the labs on day 2 there wasn't instruction what to do or why we were doing it.

One my favorite part of the camp was looking through malware.	I would like to have been instructed on what we were doing and why.
• The hands on activities that were done. Not only did we learn how to use other platforms like the Raspberry Pi and Linux, we also learned what it's like to be an attacker. The attacks were fun and it made me learn what not to do and how to protect myself.	• The long lectures without any student participation.
• My favorite part was being able to do a lot of hands on things. I would like to be in a computer science job. Before I wanted to be a Nurse. I would think about getting a job in the IT.	• Please give us less lectures and more hands on activities.
• The hands on experience. Being able to personally operate the systems such as the Raspberry Pi or router, it was enjoyable being able to learn how to do tasks on the machines myself.	• They need to give us more hands on.
	• We should have done more hands on stuff.
	• I wish there was more instruction, and that the game wasn't the sole teacher of the material but rather, a supplement to the material.
• The labs and the RAVE activities because they provided us with a means to practice and experience the information given to us through lectures. I also learned a lot from the hacker's perspective they put us in in some of the activities because it made me more aware of the danger I've been putting myself into, without realizing it.	• We didn't get to interact with the other kids and we didn't have any hands on activities to help us understand more about what we were doing on the computer. Then we needed to know what most of these scientific words meant and needed a good definition of the words.
	• The thing I disliked the most about this camp was how sometimes the teachers just talked and talked and talked. It was hard to stay focused when they did.
• My favorite put about the camp was figuring out new ways to get information. It is not always a piece of paper laid flat, but layers that go underneath it. I like doing the decoding in python.	• Lectures
	• The long lectures.
	• The long lectures.
	• Too many lectures in my opinion.
	• There were too many lectures with not as much hands-on interaction.
	• The lectures were very long and I often lost interest.
	• I disliked getting projects to do that wouldn't work.

Effective Use of Time

While effective use of time includes the instructional strategies used to engage students in learning (above), effective use of time can be seen in students' joy and immersion in their learning such that time seems irrelevant. This occurs when time is apportioned effectively and can be seen in comments such as those in the left hand column. Conversely, sometimes the use of allocated time is less effective, as represented in the comments in the right hand column. The most evident recommendation is to allocate more time. In some cases, this might mean having longer camps, however, in other cases it means using the time available more effectively by covering fewer topics in greater depth, allocating sufficient time to complete the task, and ensuring that camp time is on task.

Best Practices	Recommendations for Improvement
• The opportunities to work in the labs with the concepts we learned was good. I also enjoyed the amount of time there was to relax and the amount freedom my colleagues and I were given.	• The lack of time to do the activities.
• I appreciated how in-depth the presentations	• This camp would be better if they could provide more classes possibly a longer period or a whole day on one subject due to not enough to go through in the amount of time provided. If there were longer classes I believe more could

Best Practice	Recommendations for Improvement
about cybersecurity were. They were informative and, while overwhelming at times, very interesting.	be taught or learned by students.
• My favorite part of the camp was learning, just learning! Getting exposed to new languages, new careers, doing challenges to test my knowledge were all great. I also LOVED Google.	• This camp would be better if it were longer classes so we could learn as much as possible. • I felt rushed to learn and adsorb everything. • I didn't get to go as in depth with programming as I would have liked to.
• I loved the most about this camp was the amount of knowledge that it offered relating to cyber security. It allowed the students to explore almost every part of the topic. I felt that I was learning something new every day, which was a wonderful experience.	• There were a few things I didn't understand during the classes and wish they were a little more detailed and explained further. • I didn't like that some of the labs felt rushed and that we didn't have time to complete them all.
• The camp went by very fast; just as I began to explore the skills I had developed, the camp was already coming to a close.	• I was kind of confused during the security class (morning) and it was kind of just them telling us to do stuff and not explaining it entirely. It just went really fast and I don't feel like I learned as much from that class as I did from the others
• I had such a good time and just wish this camp had been longer.	• This camp needs to be longer in order for us to learn everything. • This camp would be better if it used time management more effectively. We wasted a week of instructional time on a game; we could've learned more about defensive cyber security and not just offensive cyber security.

Relevance/Authenticity/Application

Another important aspect mentioned by participants is with regard to the relevance, authenticity and application of what they learned. An important aspect of learning and "sense making" is understanding "why something is". Why information provides context, which is essential to encoding information into long-term memory and helping learners build adaptive knowledge structures. Another important aspect of relevance is knowing that you are working on an authentic problem in an authentic manner. Authentic learning tasks appeal to students innate sense of wonder about the world, and provide them with a sense of urgency about their ability to meaningful interact in and contribute to the world in which they live. And finally, another effective practice is to link what is being learned to students' emerging sense of identity about who they will become. To summarize, it is recommended that camps allocate time to explaining "why" something is, provide examples that link knowledge to real world practice and phenomena, and link the why and the examples to the students' futures.

Best Practice	Recommendations for Improvement
• Being able to learn how to think like a hacker, by using password decryption, Trojan Horses, etc. This made my understanding of cybersecurity much clearer, as I was able to see different methods hackers use to obtain information, thus being able to defend against it.	• I never learned the real-life applications of everything we learned in class. • This camp would be better if things were explained more in depth e.g. "do this thing on the terminal and use x information -this is why you need that information and this is what it does with it-"
• The knowledge and information that was taught during the week, although it took a while to	• There was no structure or teaching at the camp. I learned little to nothing about cyber security

deliver, the information was somewhat practical for real world use, other parts were unnecessary. • My favorite thing about this camp was that we got to use the actual tools and techniques used by professionals. • Learning how to protect myself from hackers. • I liked that the camp was hands-on and we got to use professional grade software. I enjoyed working with Kali Linux and Wireshark. The Raspberry pi setup was fun and I enjoyed it. One my favorite part of the camp was looking through malware. • Being able to learn the different majors I could take in college to set me in the correct path toward my desired job. I was unaware of Cognitive Science and how essential it is for the future of all jobs. I plan on double majoring with the course now by being informed of the benefits and my interest in the material. This contributed to me learning how broad the field of cyber security can be and how different fields can relate to it. • I really enjoyed the various speakers that came to inform us about future opportunities.	at this camp. I actually have a background in computer science, but this background seemed useless, as the activities did were not related to computer science whatsoever. There was also little to no explanation on how to do any of the activities. Any actual teaching was not helpful at all during the activities because all we learned was very minor information on very few cybersecurity terms, but never enough information to be useful to use in the future. • This camp would be better if we learned more about what exactly we were doing instead of solving it but not knowing what you did. • This camp would be better if we learned more about careers in computer science.

Interest in Students' Learning

Another theme concerns the commitment of the camp teachers/mentors to students' learning. Salient points include: a) the value of a respectful climate, 2) targeting learning to learners' interests, abilities, and learning styles, 3) autonomy, and 4) student/teacher ratio. Recommendations for camps include cultivating a natural curiosity and respect for students' interests and learning progression. A few illustrative comments include:

> "More important than the curriculum is the question of the methods of teaching and the spirit in which the teaching is given." - Bertrand Russell.

> "Students don't care how much you know until they know how much you care." - Anonymous.

Best Practice	Recommendations for Improvement
• I loved how the teachers/teaching assistants were always ready, willing, and able to explain concepts--both those we may not have understood during the lesson and extra stuff that wasn't originally included. I feel like I learned so much about computer science. • My favorite things about this camp were the opportunity to meet people with common interests, and the amazing teachers cared about us and who took time from their schedules to teach us their knowledge. I really appreciate	• This camp would be better if they asked more for the participants' opinions. For example, asking what type of activities they wanted to do and what they were interested in, that way the students would be more encouraged to come to the camp. • I wish the kids got to choose the groups they were in and the counselors were nicer. • They should split us up in groups by level of knowledge. • The thing I disliked the most about this camp

everyone that put the effort in to make this camp great.	was the fact that at times, the workload got slightly larger than I had anticipated, and left me a bit overwhelmed.
• I loved meeting new people. The teachers were amazing! They made everything super easy to understand.	• I disliked the fact that the teachers didn't try very hard to keep our attention.
• You learned and had fun at the same time and how we had certain freedoms.	• Students could learn more and have more interactive labs if you would remove the distractions like other students who no longer care about the subject or the camp
• The teachers were very kind and helpful. All of the faculty was very understanding and genuinely cared about my learning experience.	• We moved at a slower pace, and gave more assistance to those with minimal cyber security/ computer science experience.
• Learning something new and I really liked that all my questions were looked into and respected.	• Don't have college students try to teach us, if they don't know how.
	• As I am already greatly involved with computer science and computers in general I feel as if a more advanced group would be beneficial to people like me. While I still learned new things in the camp as a whole, a lot of what we covered was more common knowledge to the "computer world".
	• There need more teachers in the room to help stragglers and another teacher to get people ahead.
	• They need more proctors or instructors on the same page to help. We had lots of help, but some of the graduated students that were helping would either get confused easily, being that they didn't understand English very well. Another being that they were impatient at times and would walk away to get help....and not come back.

Sense of Community

A successful learning environment creates a community that promotes positive social skills and academic achievement. Humans learn best when they feel they are part of a community, where everyone feels accepted and where individuality is encouraged. Creating such a community requires planning and practice where participations learn how to safely take risks, be wrong without shaming and retribution, participate in class meetings, work collaboratively, and resolve conflicts peacefully with some of these resources. This evaluation found that the camps with higher overall scores seemed to be more effective in creating this inclusive and welcoming sense of community, and camps that scored less well had specific comments to the contrary as shown by a few excerpted quotes below.

Best Practice	Recommendations for Improvement
• I really enjoyed connecting with other girls with similar interests, and I also really loved learning different computing languages (JS, CSS etc.) The TA's were awesome as well.	• The camp counselors were too strict and treated us like children which was a bit aggravating because even at school I am not as restricted to do certain things as I was here.
• The people. I really liked the environment of this	Some of them were very rude to us or rushed us

camp. Of course the material was interesting to learn, but it wouldn't have been the same if the camp wasn't organized and comfortable like it is. When I say comfortable, I mean that everyone-- students, teacher assistants, professors, developed a very close relationship. We helped each other when the learning material was difficult, and we worked together to solve problems. Not only was this an educational experience, but it was also really really fun.

- Being around people with a similar interest.
- Being with others of the same mindset as me.
- Hanging out with everyone, especially the counselors due to the fact that they were all so cool and relatable. All of them, except one, took their time to come and meet with us to get to know us more and we all shared a great connection. I can't choose one thing as my favorite because there was so much fun things that we did. We had so many friendly competitions that brought all of us closer and knowing that camp is almost over really makes me sad.
- My favorite thing about the camp was the people. The college counselors, the junior counselors, and the campers.
- Making new friends and laughing with my friends and learning things together as a team.
- The counselors. They were "chill". Very understanding and helpful.
- The other campers were one of my favorite.
- My favorite thing about camp was meeting and working with new people

which gave me anxiety.
- Interacting with other members. This camp doesn't realize that people have social anxiety.
- Some of the girls in the camp only came because it was free. I still think it should be free, but the girls should want to come to learn.
- I wish the teachers were more interested in getting to know the kids. They seemed like the had their own teacher clique.
- I wish they had used an interview process. There are those in this camp who didn't want to be here. A willingness to participate can be confirmed by a simple phone call interview.
- Stronger interactions with newbies.

Organization and Environment

Sometimes physical environmental conditions may affect one's ability to learn. For instance, if one is located in an area that is prone to many weather disasters such as hurricanes, then they may not have the best opportunity to learn. Most of their time may be spent coping with the challenges of poor weather thus making it very difficult for them to concentrate. Different environments may boost or distract students from learning. It is possible that some camps will have some students that like the environment and others who do not. And it could be easy to dismiss the need to make changes-you know the old adage…."you can't please everyone". The main point to remember is that environment can and does affect the learners' experience. If providing an environment conducive to learning is not important to the camp

organizers, it sends the implicit message to the campers that they are not important, their learning is not important, which clearly is not the desired outcome.

Best Practices	Recommendations for Improvement
• The people. I really liked the environment of this camp. Of course the material was interesting to learn, but it wouldn't have been the same if the camp wasn't organized and comfortable like it is. When I say comfortable, I mean that everyone-- students, teacher assistants, professors, developed a very close relationship. We helped each other when the learning material was difficult, and we worked together to solve problems. Not only was this an educational experience, but it was also really, really fun.	• Very disorganized. Please inform students of what to bring to camp and hand schedules out on the first day. • Some things weren't organized and sometimes I couldn't understand the speakers because they speak as though we already know everything • How disorganized it was at first. Otherwise I enjoyed it all. • The lack of planning in the beginning and loss of interest from part of group • You need a better location. • You should fix the WIFI where I was sitting. • This camp needs to be in a better location • The noise was a distraction, it shouldn't be next to very loud people • It also would've been nice to have more breaks and maybe have snack provided as we are teenagers and starving.

"It is the supreme art of the teacher to awaken joy in creative expression and knowledge.~ Albert Einstein

The themes presented above obviously overlap, and in cases, the above quotes reflect that. But truly outstanding learning experiences are more than a summation of these factors: 1. effective instructional strategies; 2. making learning relevant, authentic and applicable; 3. effective use of time; 4. demonstrating interest in students' learning; 5. sense of community; and 6. organization and environment. There is a certain magic that occurs when all of the factors constellate to create a unique and special learning experience. The following quotes were selected to convey what can happen when these factors bring a camp to life.

I loved everything about this camp. Before coming to this camp, I had an interest in Computer Science but I wasn't too sure. The various activities and discussions have reassured me that Computer Science is a field that I want to pursue as a career.

I learned so much, so much help, and the challenge, and how I ended up feeling confident with myself more than I ever did because now I know something and actually know how to find someone's information, and I know the knowledge of how it's easy to hack into someone's system.

It was really interesting and I now have more confidence in possibly pursuing a career in the cyber security field. Thank you!

I loved practically everything about this camp. From the teachers/assistants to the various activities and tools we learned about cyber security and computer science. My MOST favorite would probably be making our own website and using it to learn how to change, edit and update information on the site even after making the basic structure of the site. It taught me a lot on "making" and was fun at the same time. I also really enjoyed having the "murder mystery" throughout the days of the camp that allowed us to use what we learned actively to solve the "mystery."

> I greatly enjoyed getting to learn about cyber security, as well as getting to meet people who have interests similar to my own. The camp was well structured and thought out, and I really enjoyed the lectures.

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Teachers are expected to reach unattainable goals with inadequate tools. The miracle is that at times they accomplish this impossible task.~Dr. Haim Ginott

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Conclusions

The 2015 was overall very successful in meeting its goals. The intent was to have 286 teachers and 1397 students participate in the 2015 summer camps and the actual participation numbers were 240 teachers (83.91% of planned) and 1222 students (87.47% of planned). The program intended to reach a diverse set of teachers and students and appears to have done an excellent job in achieving this goal. Fifty five percent of the 240 teachers were female and 30% were minorities. Fifty percent of the student participants were female and 50% of the student participants were minorities.

The evaluation collected data from 217 teachers, a response rate of 90.41%, and from 1035 students, a response rate of 84.70%. The evaluation from the teacher camps finds program appears to be overall very successful with participants reporting they strongly agree that they: 1) learned a lot about cybersecurity and computer science, 2) are very interested in cybersecurity, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) intend to integrate cybersecurity into their teaching, and 5) had a productive and enjoyable camp experience. Participants also report that they agree that they: 1) are interested in computer science, and 2) feel confident to integrate what they learned into the curriculum. Teachers report plans to reach 13,972 students with new curriculum in the 2015-16 academic year.

The 2015 GenCyber Student Camp program appears to be overall very successful with participants reporting they strongly agree that they: 1) had a productive and enjoyable camp experience, and 2) learned a lot about computer science. Participants also report agreement that they: 1) learned a lot about cybersecurity, 2) are interested in computer science, 3) feel confident they understand the importance of cybersecurity (self-efficacy), 4) are very interested in cybersecurity, and 5) are more interested in pursuing a career in cybersecurity after attending the camp. The improved interest in pursuit of careers in cybersecurity is particularly in contrast to participants reporting that they neither agreed nor disagreed that they planned to pursue a career in cybersecurity before attending the camp.

The expanded proof of concept of the GenCyber initiative, which has multidisciplinary implications, has provided a great deal of knowledge and experience that will be leveraged to improve on future iterations of the program. While overall the program appears to be highly successful, some things can be enhanced or improved; the program succeeds when each individual camp succeeds. As written by Dr. William T. Neumann, GenCyber Camp Director, in his University of Arizona "Final Report for Student Program[s]", "GenCyber, to some extent, is a process or cognitive dissonance – the process is as much correcting misimpressions [about cybersecurity] as it is teaching new concepts. The evaluation concludes with the following high-level summary of best practices and recommendations for improvement as gathered from all sources of program data.

Teacher Camps

- Articulate achievable learning goals and then plan instruction to achieve them.
- Provide sufficient time to practice with hands on and active learning, and provide more printed reference materials during instruction to allow participants to catch up during fast-paced activities.
- Carefully balance lecture with active learning.
- Help learning scaffold knowledge by accounting for incoming knowledge, and providing contextual explanations.
- More effectively manage camp instructors and assistants to provide help to participants who may need additional assistance. Begin instructor preparation earlier in the process to facilitate camp running more smoothly.
- Better balance course duration, as shorter camps can be effective for exposing teachers to the area but are less well suited for preparing them to transfer what they learn into their curriculum.
- Outline goals for curricula development and transfer and ensure there is time at camp to work on this.
- Maintain consideration for teacher's summer schedules. Teacher's schedules are becoming increasingly full during the summer, which can be a challenge for a one-week residential program. Teachers are often in demand for STEM summer school classes, which further narrows the time window students would be available for attending. Stipends are a potential way to address this issue.
- Influencing K-12 institutions to instill cyber security first principles and secure programming practices as part of their curricula can be challenging, as many teachers have limited control over introducing largely new content into lesson plans or establishing new classes. The establishment of after school programs and the engagement of school administration may address this issue.
- Provide consideration for various levels of abilities and work ethics, potentially providing read-ahead materials prior to the camps or employing various methods to divide instruction by ability level. Employ methods to tailor teaching content and styles to the target audience.
- Potentially integrate or embed more student and teacher camps. It works well to assist teachers with skill building by observing a learning process, being mentored as they develop their own plan, and being offer a low-risk environment to practice their skills as teachers to the class.
- Achieve better ratios of instructors to teacher participants.
- Provide reference materials and/or non-Government-funded devices for teachers as camp take-aways to facilitate continued learning for teachers and their students in the classrooms.
- Consider potential to provide continuing education units, etc.
- For universities and colleges hosting student and teacher camps, consider having the teacher camp prior to the student camp enabled the instructors and the High School teacher to be better prepared for the summer camp.
- For residential camps, provide a better detailed list of what students should bring (recreational equipment, what is in the dorms, laundry, etc.)
- Send out a parent awareness package regarding start dates, supplies, dress codes, etc., as applicable.
- Include more hands-on experience with real-world scenarios where possible.
- Potentially level GenCyber participation as a gateway to address the lack of local, funded lab environments, potentially involving school administrators.

Student Camps

- Make effective use of hands on learning. Students thrive on active learning material, and learning with their peers. Also account for shorter attention spans often found with high school and grade school students.
- Make good use of time. This does not mean cramming 8 weeks of material into 1 week. While making camps longer is one way to make efficient use of time, camps also might want to try and cover less material in a single year and begin thinking about multi-year or year round camp experience.
- Make material relevant to learners to enhance their learning and increase their interest. Learners want to understand why something is the case, know how to use their knowledge to make sense of and contribute to the world, and attach their learning to their future plans.
- Demonstrate a commitment to and interest in students' learning.
- Provide more printed reference materials during instruction to allow participants to catch up during fast-paced activities.
- More effectively manage camp instructors and assistants to provide help to participants who may need additional assistance. Begin instructor preparation earlier in the process to facilitate camp running more smoothly.
- Make strides to create a camp environment that fosters a community where learners feel included, wanted, and valued.
- Present a well-organized physical environment that is conducive to the size and activities of the camp.
- Achieve better ratios of instructors to student participants.
- Consider the pros and cons of residential programs versus non-residential programs. Although more costly and more difficult to run, residential program offer distinct advantages in terms of outreach to participants from more distant communities.
- Consider potential to provide college credit for participants.

GenCyber Program

- Start the program notification process earlier
- Enhance the GenCyber website to provide a repository of content developed and used by all camps.
- Consider ratio of instructors to participants more closely in effectiveness of camps.
- Integrate pedagogical-related content from the pedagogical checklist and camp site surveys into a single document.
- Ensure that future year camps are aware that the program is exempt from the IRB process, and/or it is not a requirement.
- Ensure that potential camps are aware that GenCyber camps can be jointly funded by additional sponsors as long as it meets the requirements of a GenCyber camp.
- Provide additional guidance and stipulations for residential camps.
- Consider potential for "program mentors", individuals beyond program office members and the site visit team that could serve as mentors during the design process of the camps.
- Consider returning to capturing pre-test survey data. We did not capture pre-test surveys this year, only post-test surveys and the significance in that we do not capture the deltas of information. Although someone may rank low or middle of the road, their delta of change may actually be much larger than those who ranked high.

Appendix A: End-of-camp Survey Questions

1. I enjoyed learning about computer science
2. I would like to learn more about computer science
3. I enjoyed learning about cybersecurity
4. I would like to learn more about cybersecurity
5. The teachers/faculty in this program made me more interested in computer science
6. The teachers/faculty in this program made me more interested in cybersecurity
7. I know what cybersecurity means
8. I know more about cybersecurity than I did before this camp
9. I know more about computer science than I did before this camp
10. I am more comfortable learning cybersecurity concepts now
11. I am confident that I can teach others about cybersecurity
12. I am confident that I can teach others about computer science
13. I intend to introduce cybersecurity concepts in my teaching
14. I know more about information security than I did before this camp
15. I can explain why cybersecurity is important
16. Overall this camp was a good experience
17. I am glad I attended this camp
18. I would like to attend more camps like this
19. My opinions and ideas were respected in this camp
20. I found the camp activities interesting
21. I liked interacting with the teachers at this camp
22. I enjoyed the projects and activities at this camp
23. I met new colleagues at this camp