Elementary School Cyber Education Initiative

Beyond the Bell

in partnership with

LA's BEST

Evaluation Report
Spring 2016

Prepared by

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Executive Summary

During the spring semester of 2016, the Beyond the Bell (BTB) Branch of the Los Angeles Unified School District implemented an after school Elementary School Cyber Education Initiative at six elementary schools. These "CyberPatriot Clubs," were implemented in partnership with LA's BEST, a community-based organization that operates after school programs at 194 high-need elementary schools in Los Angeles. As the newest of LA's BEST digital learning classes, CyberPatriot Clubs are designed to promote basic computer skills, cybersecurity principles and skills, and socio-emotional learning. The activity culminated in a cybersecurity competition among the six participating elementary schools.

Results of a post-survey given to 72 student participants suggested that the CyberPatriot Clubs helped a vast majority of students improve their digital self-efficacy, cybersecurity knowledge, socio-emotional skills. Improvements in digital self-efficacy included using a computer, accessing information on the Internet, creating documents and slideshows, editing pictures, typing and entering data on a spreadsheet. Increased cybersecurity knowledge included how to stay safe online, avoiding computer viruses, and protecting personal information. Socio-emotional learning included showing other students how to do things, working in groups, persisting on a hard task until completion, and resolving conflicts with peers.

Focus group participants (club instructors from LA's BEST) reported having a positive overall experience in the program. They also said that students really enjoyed the program, experienced it as fun, and were motivated to learn. Students especially enjoyed the games.

Challenges encountered by instructors included learning ahead of the students, not having enough computers, and teaching students from a wide grade span (grades 3-6), with varying levels of basic computer skills.

Suggestions for program improvement were:

- Provide a common implementation plan at the beginning that allows for individual creativity within a structure, allowing for fewer staff trainings.
- Increase the variety of games for students to play and make them more challenging.
- Create games that require more of the functions that will be required in competition and make them available earlier.
- Add physical, outdoor games to teach cybersecurity concepts.
- Make competition computers available earlier in the semester.

Instructors' suggestions for improving the culminating event included holding a pre-competition at each school site, and making information about the competition available further ahead of time so teams know what to prepare for.

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Student Survey:

Summary of Results

Section 1

Student Survey: Summary of Results

Following the pilot season, LA's BEST and an external evaluator conducted a student survey to measure digital self-efficacy, cybersecurity knowledge, ability to work on a team, and to obtain feedback about students' experiences in the clubs. A total of 72 elementary students in grades 3-6 responded to the survey. Findings are summarized below:

Digital Self-Efficacy

The following percentages of respondents reported that CyberPatriot helped them improve the following basic computer skills:

- Use a computer.....97%
- Search the Internet for information 88%
- Create a document, letter, or flyer.....74%
- Edit pictures 68%
- Type using the home row 60%
- Create a slideshow presentation 57%
- Use a spreadsheet or table to enter data.....54%

Cybersecurity

The following percentages of respondents reported that CyberPatriot helped them improve the following cybersecurity skills:

- Avoid getting a virus on the computer 81%
- Stay safe online when using a computer..... 81%

In addition:

- 85% knew not to give their parent or guardian's name to a stranger.
- 71% identified their name and address as types of personal information.
- 65% identified their telephone number as a type of personal information.
- 50% identified Trojan Horse, Sasser Worm and ILOVEYOU viruses as types of malware.

Socio-Emotional Learning

The following percentages of respondents reported that CyberPatriot helped them improve the following socio-emotional skills:

- Show other kids how to do things 85%
- Work in a group to get something done.....83%
- Keep working on something until finished, even if hard.....77%
- Solve a problem by talking with the student I am mad at.....66%

The CyberPatriot Club

When asked about their experience in the CyberPatriot Club:

- 91% said they did not know anything about cybersecurity until participating in the club or learned more information about cybersecurity to build on what they already knew.
- 87% said they would recommend the club to friends.
- 86% said they liked playing the computer games.
- 81% said they would participate in the club again.

Response frequencies by survey item appear on the following pages.

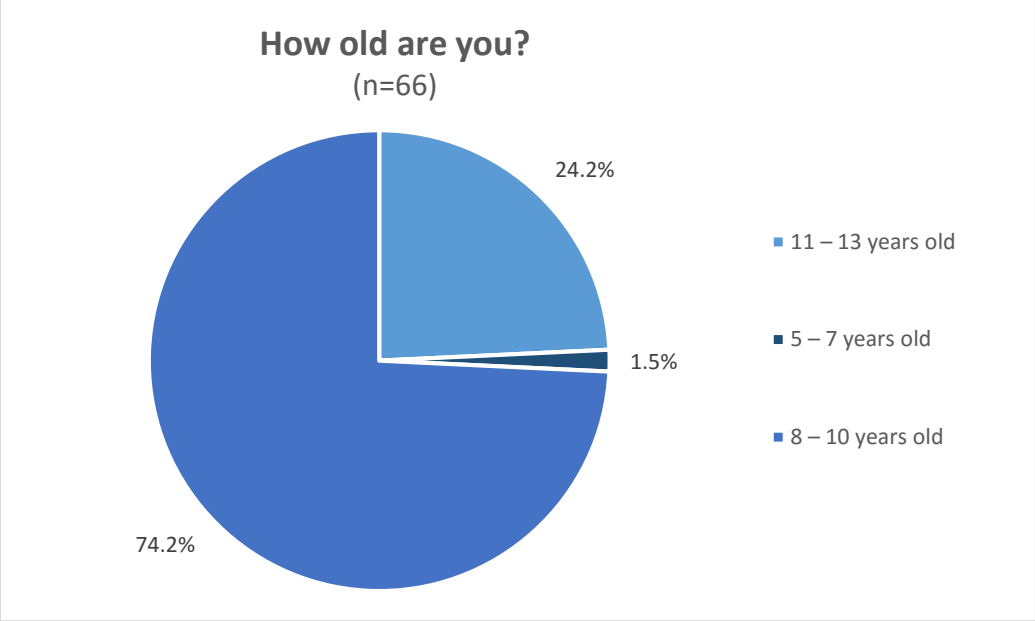
Student Survey:

Response Frequencies by Item

Section 2

Student Survey: Response Frequencies by Item

Figure 1.



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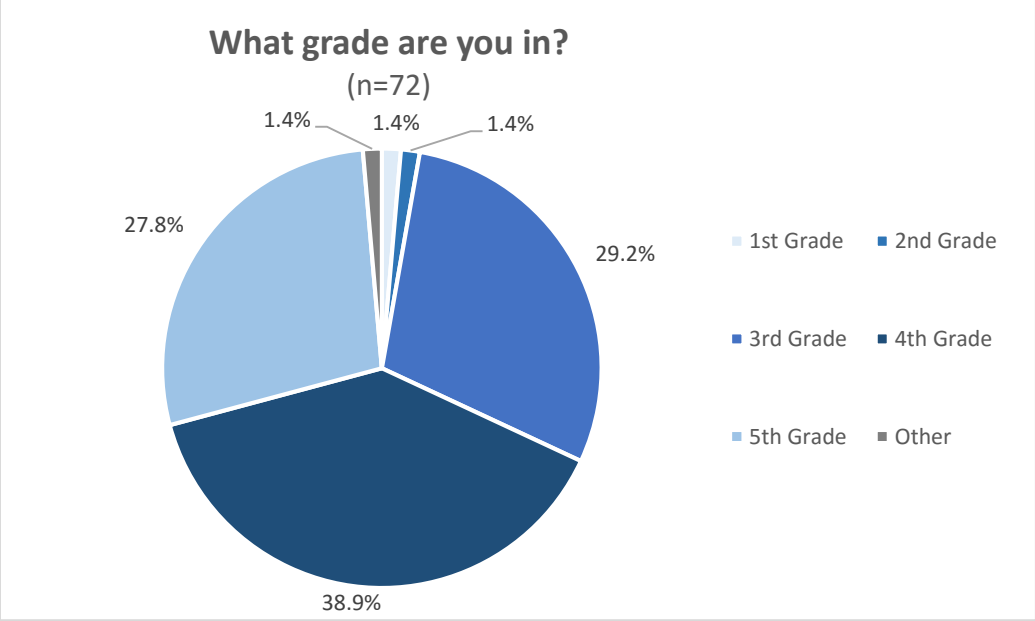

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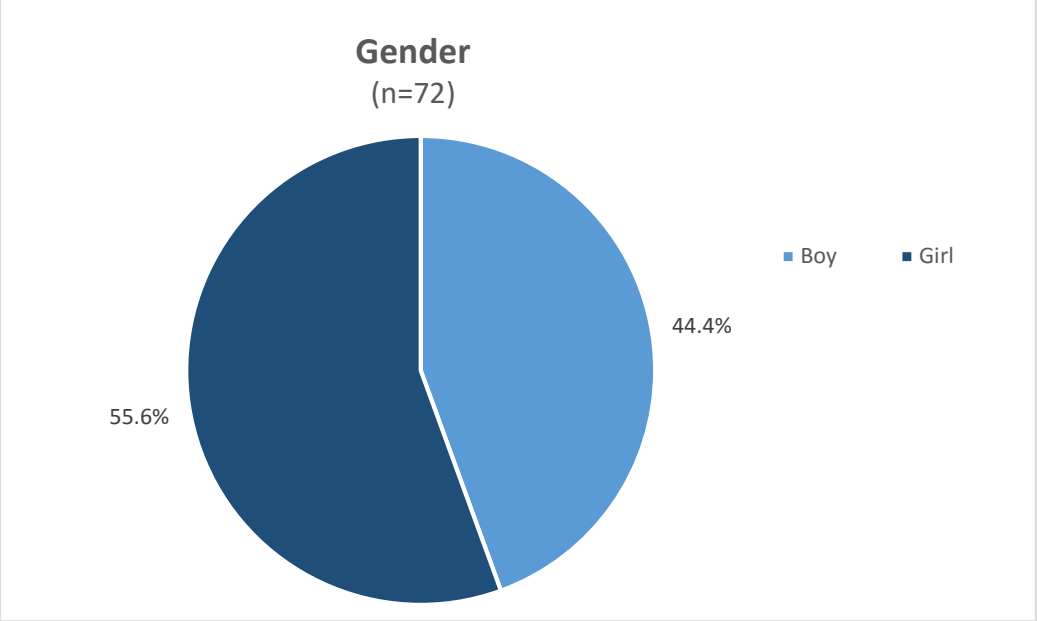

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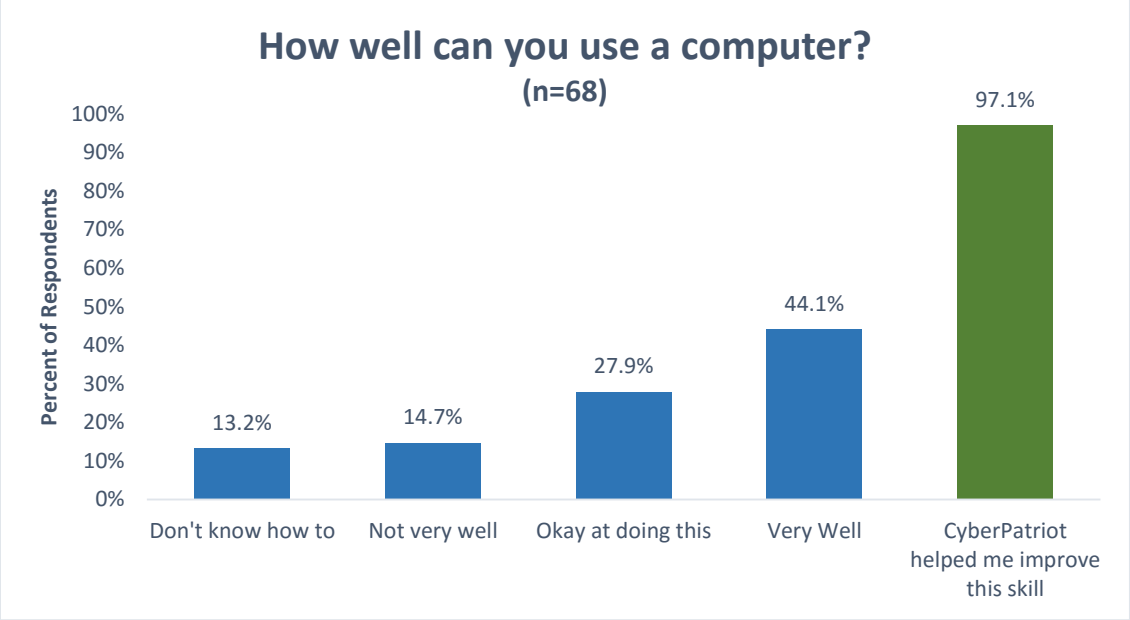

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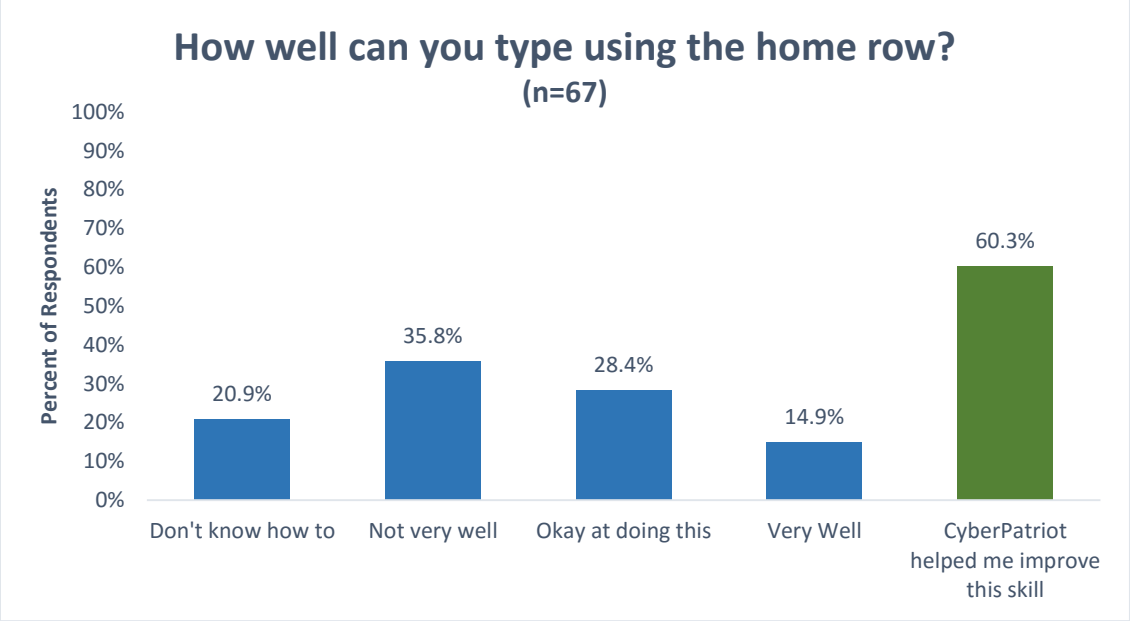

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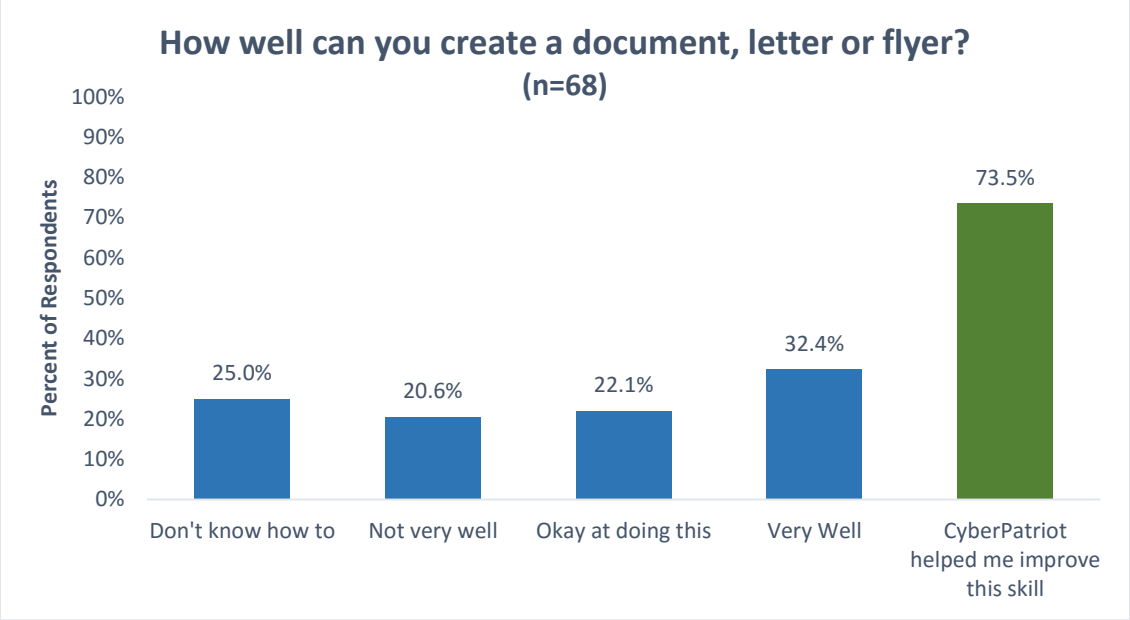

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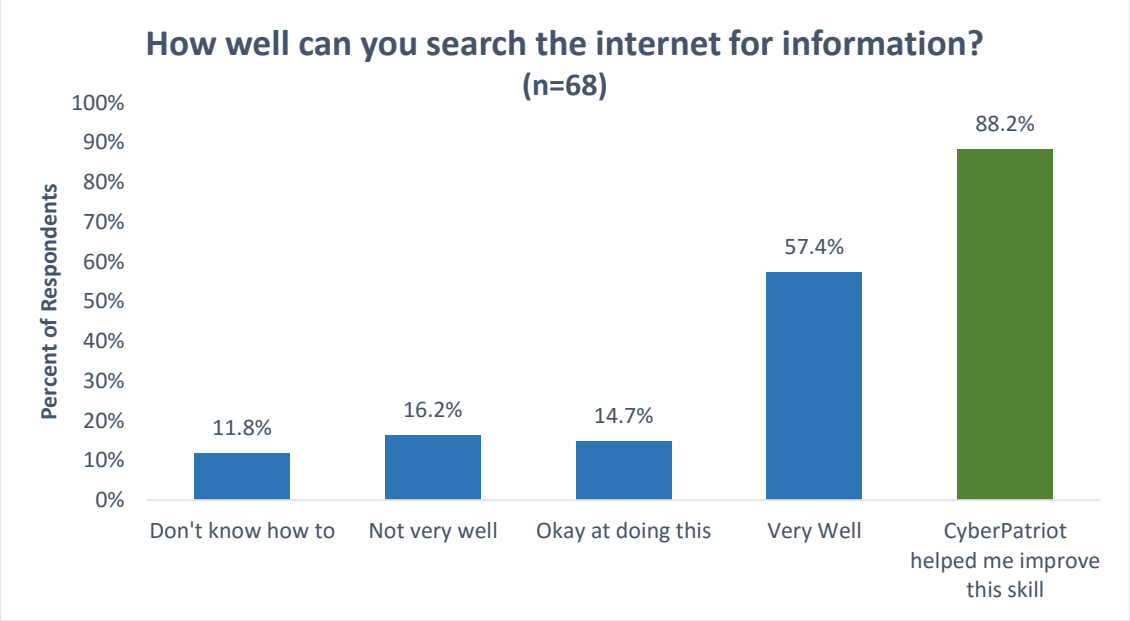

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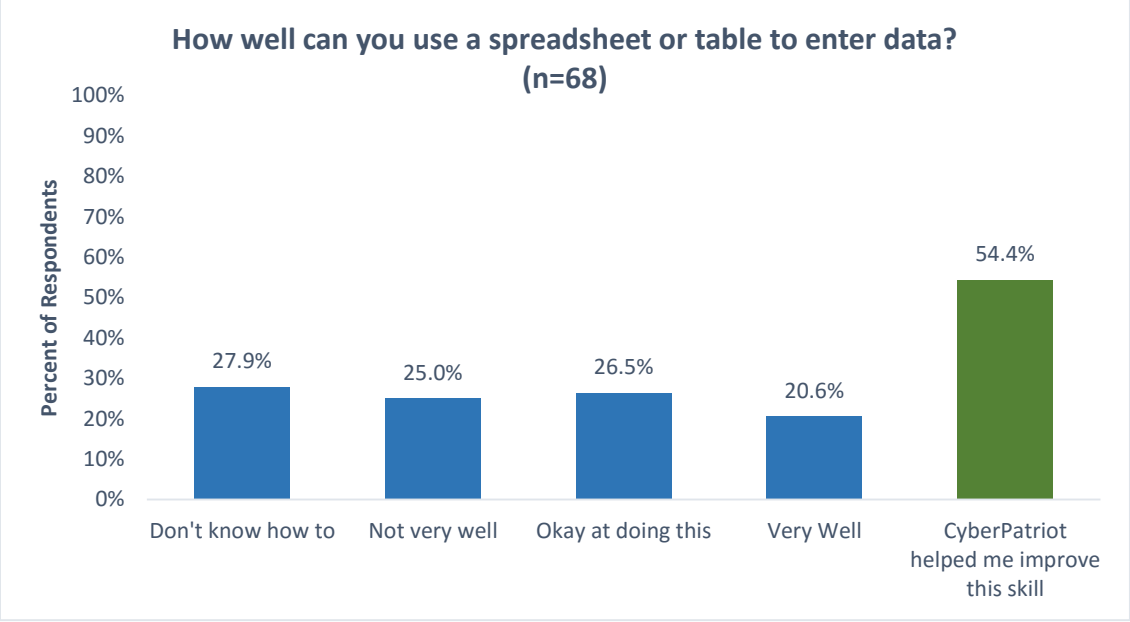

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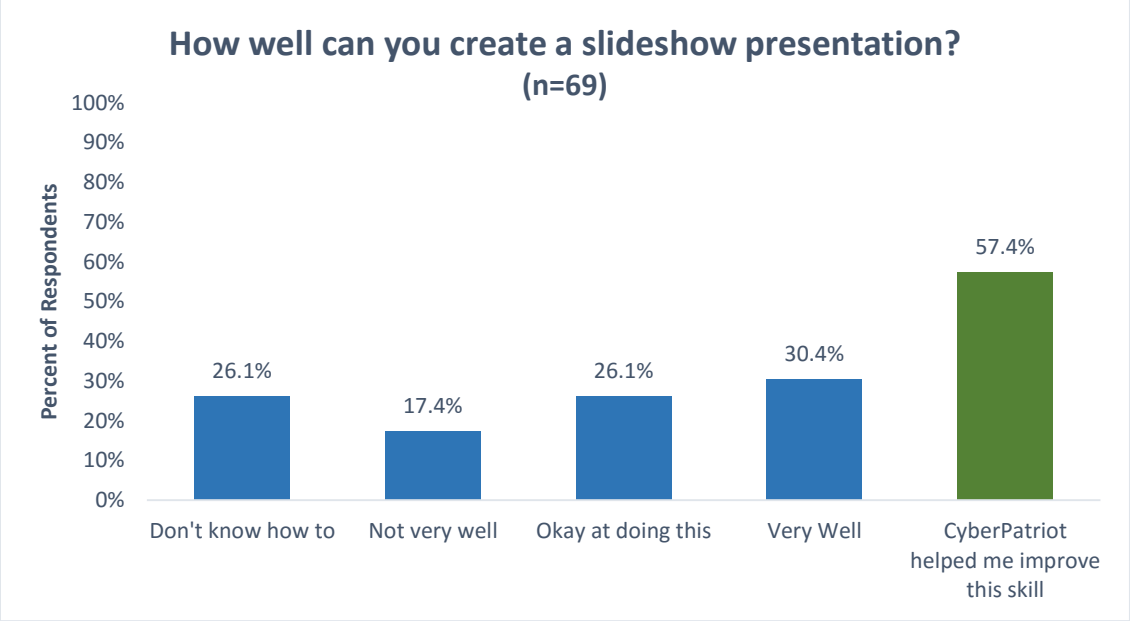

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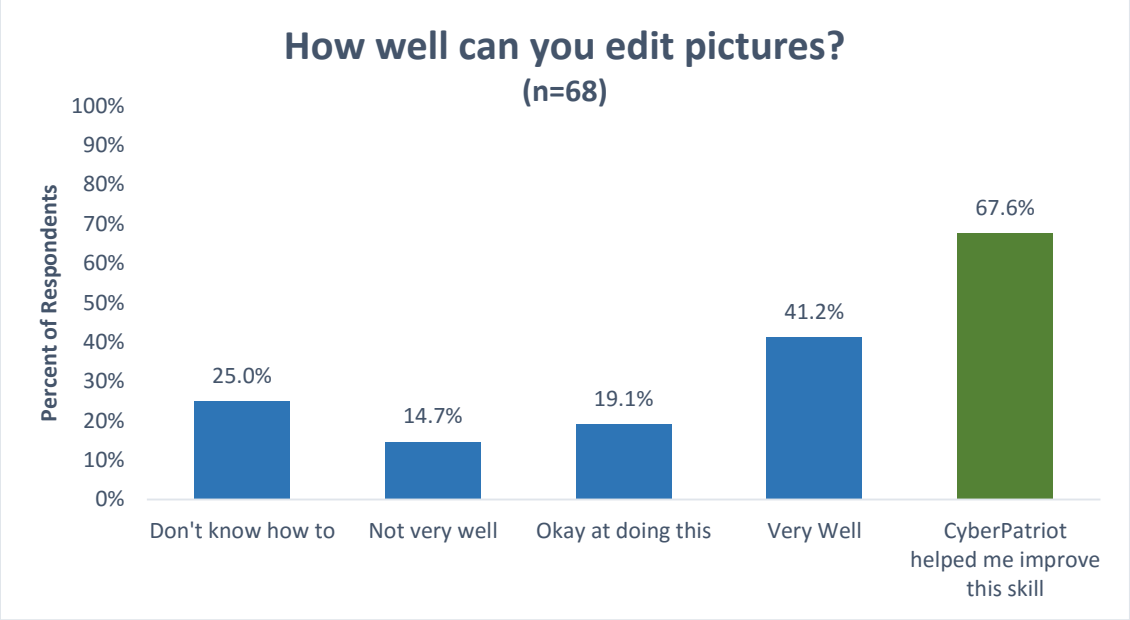

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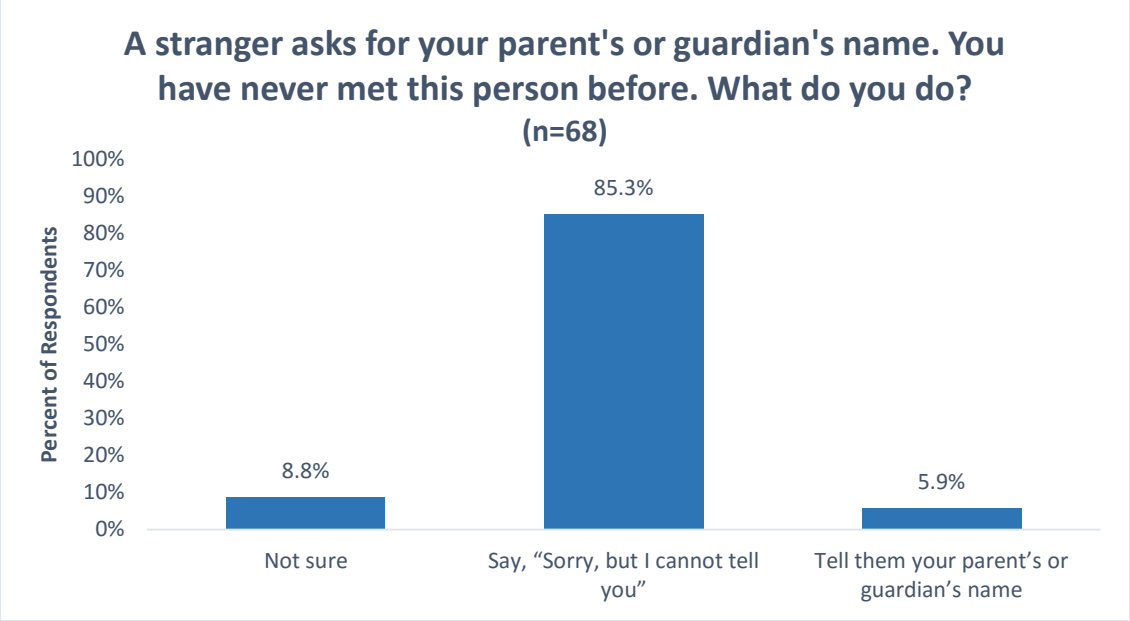

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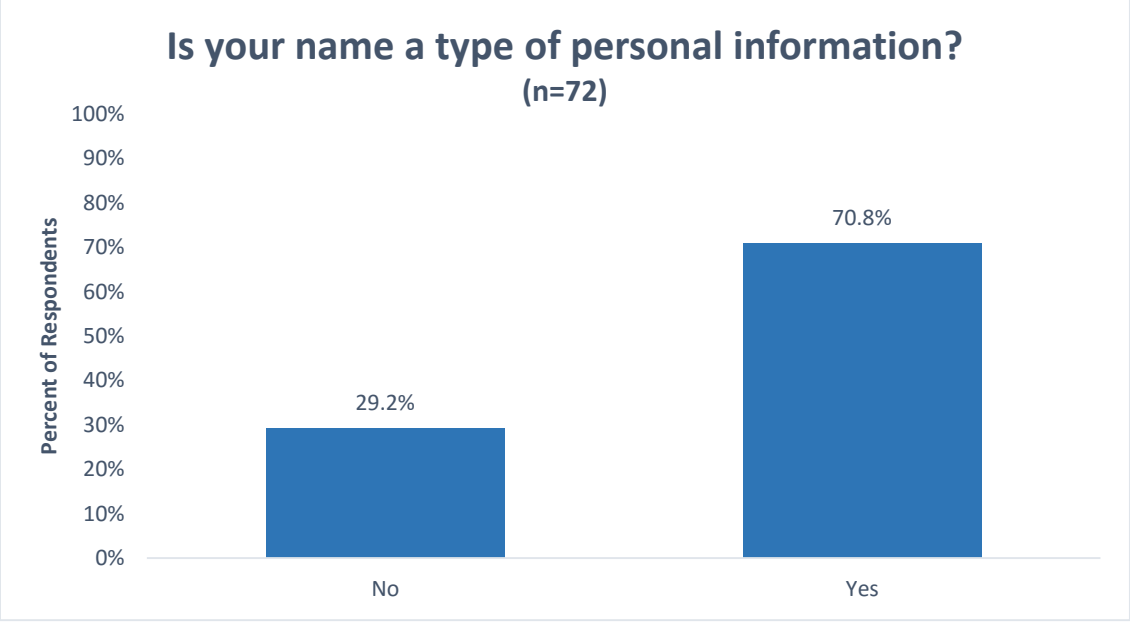

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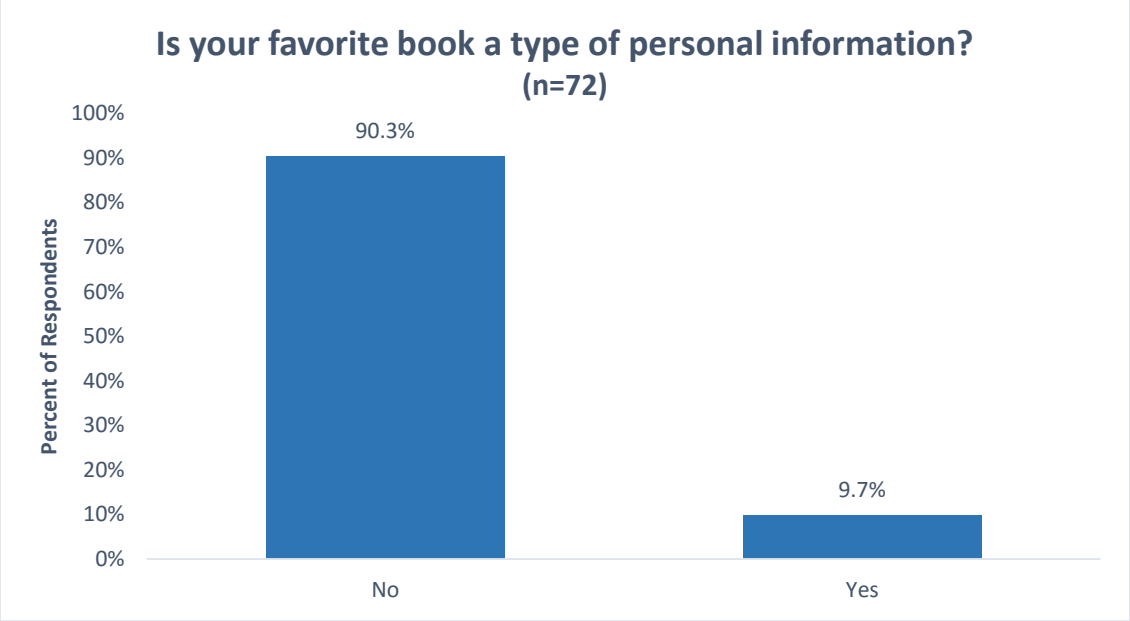

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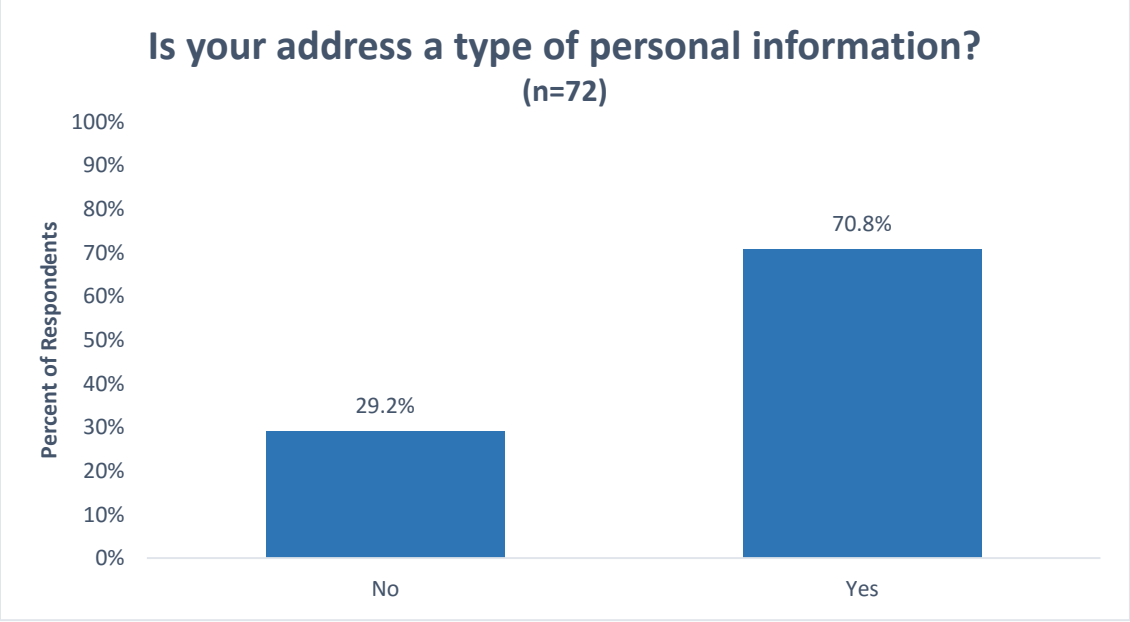

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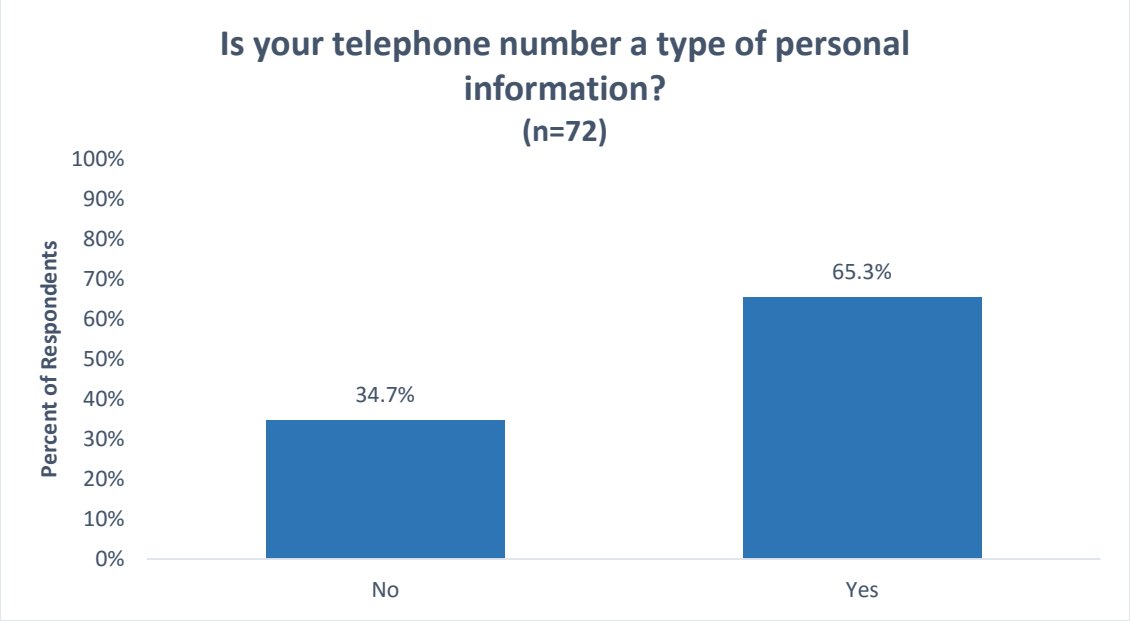

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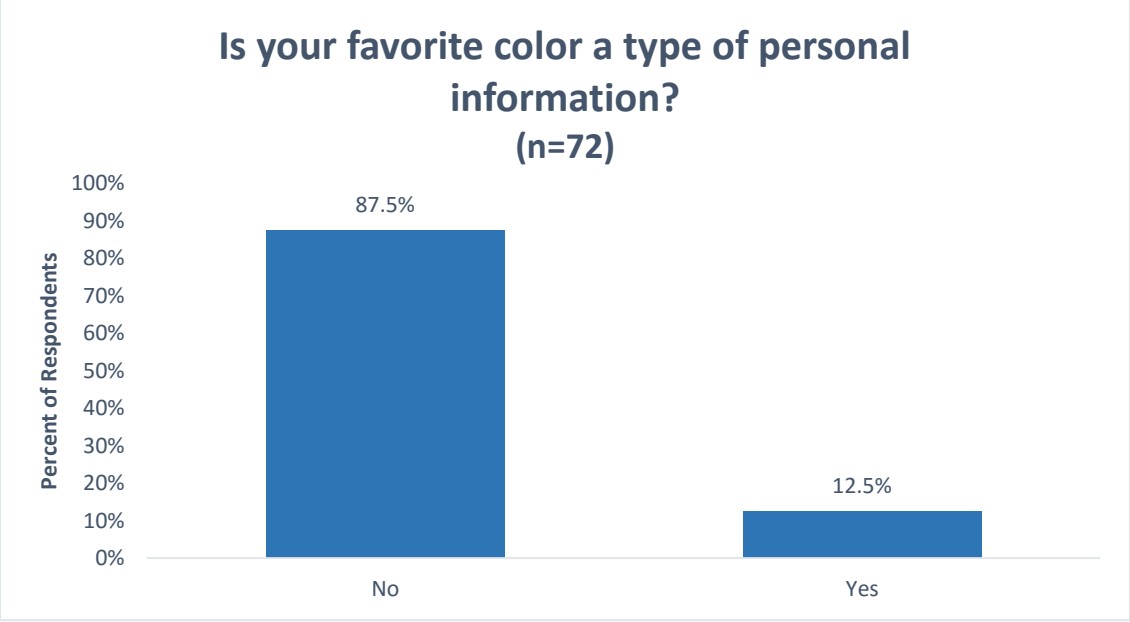

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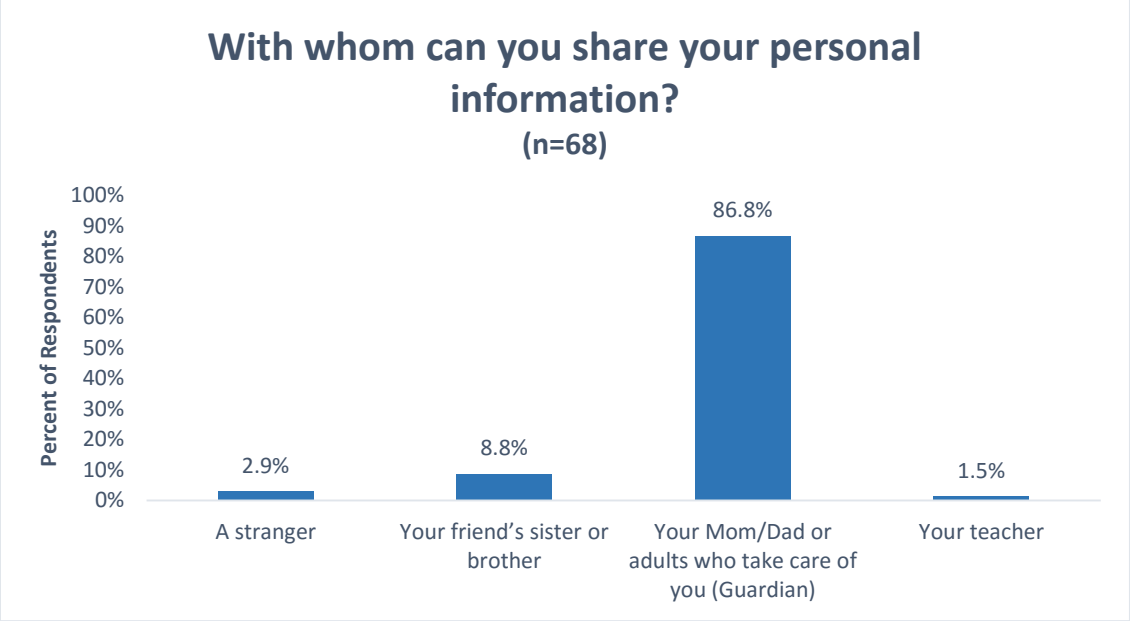

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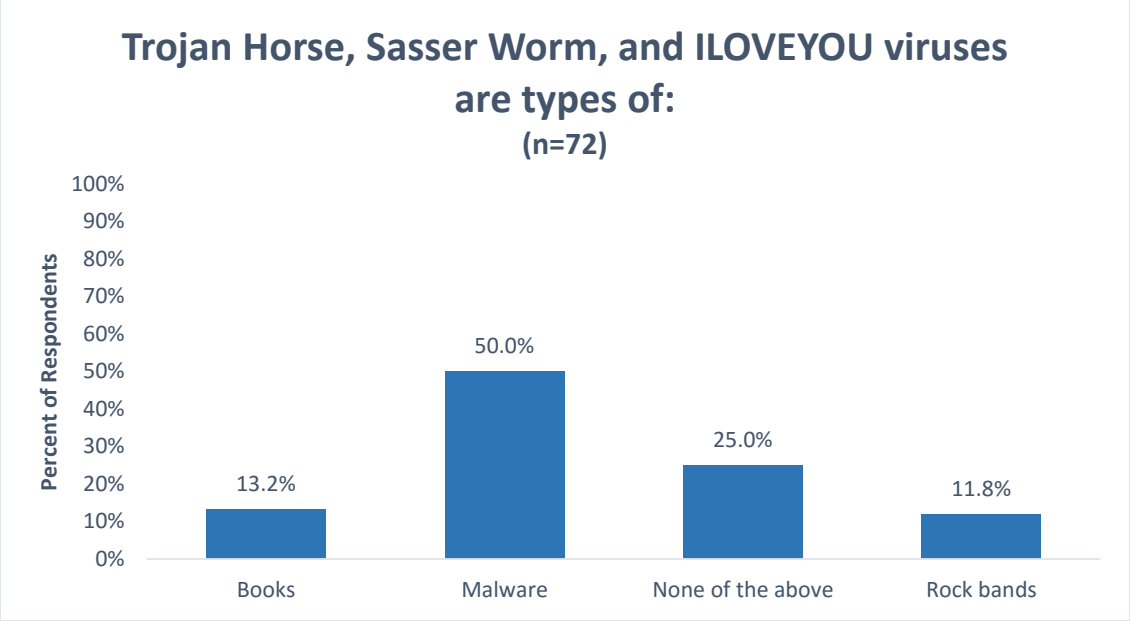

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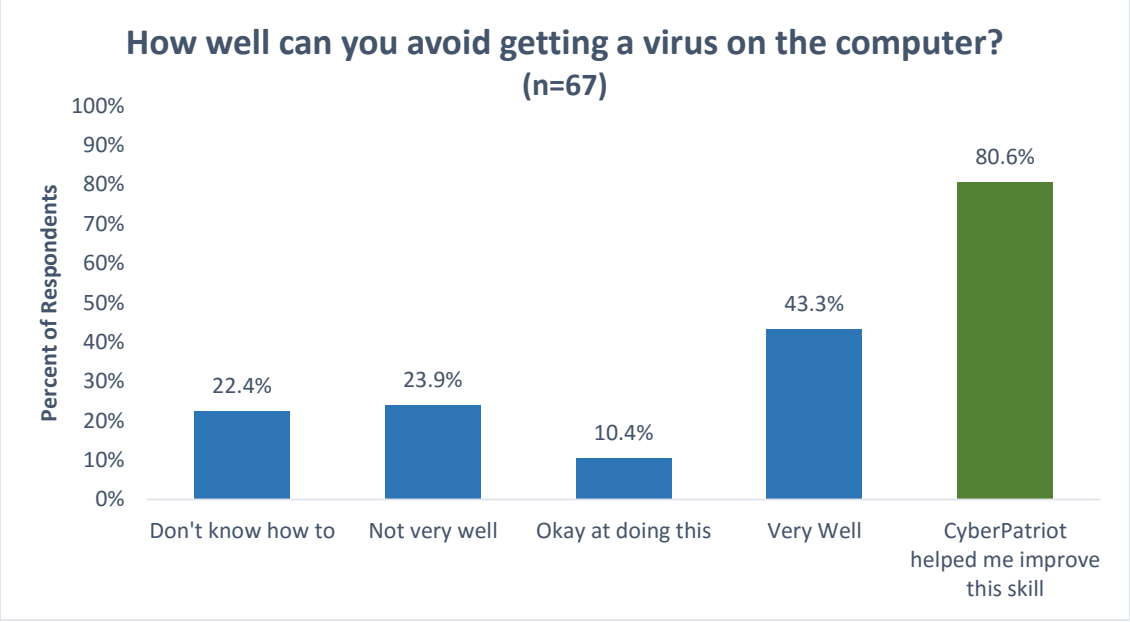

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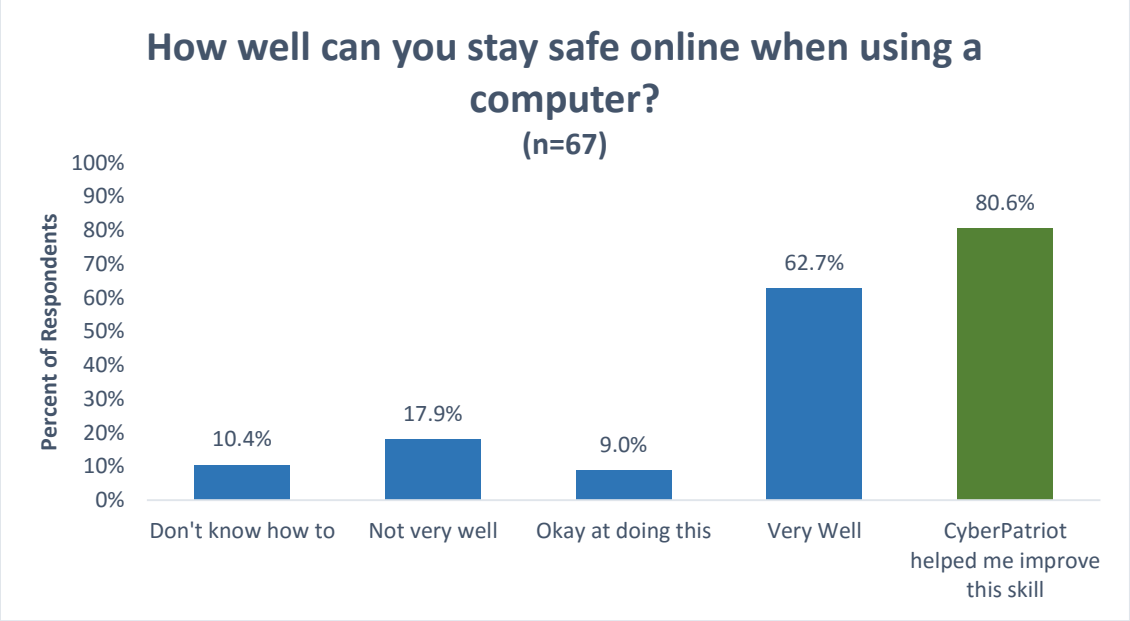

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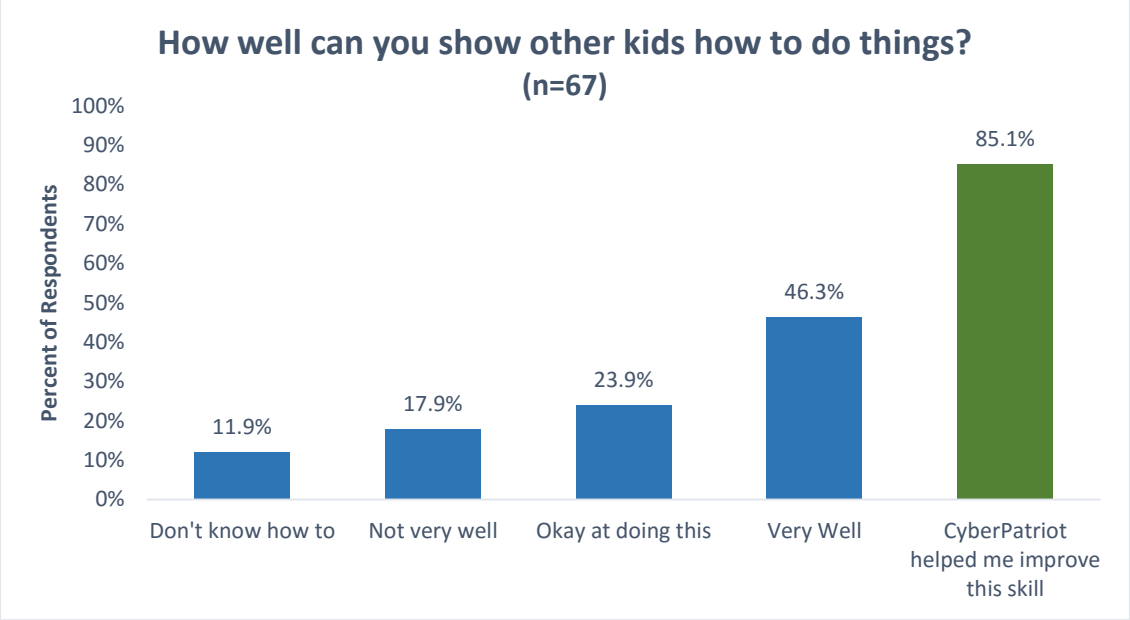

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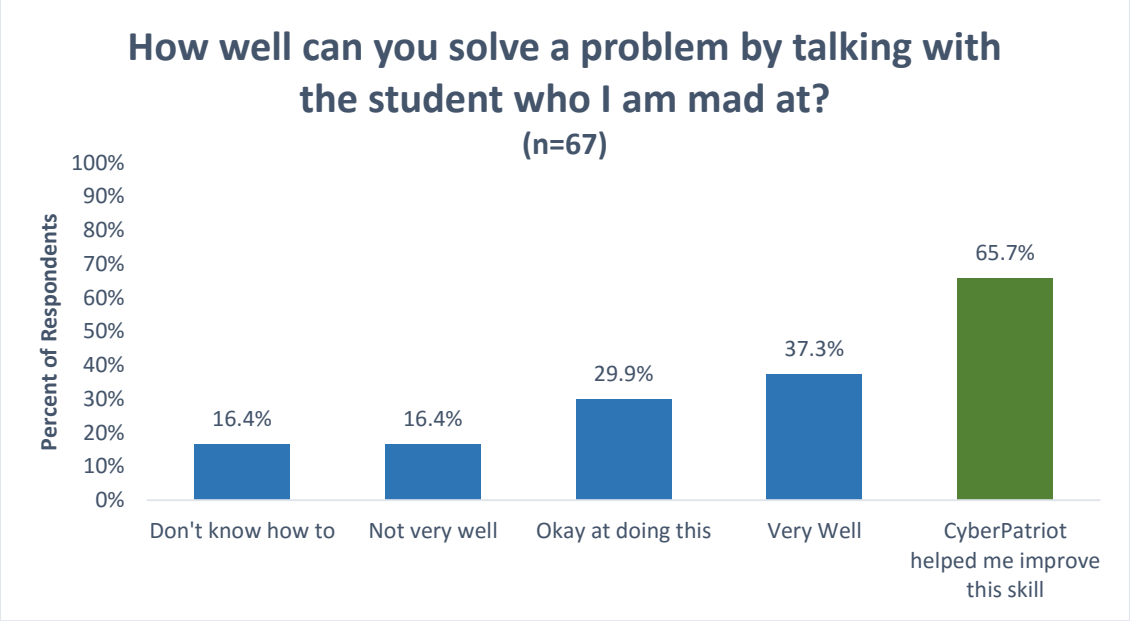

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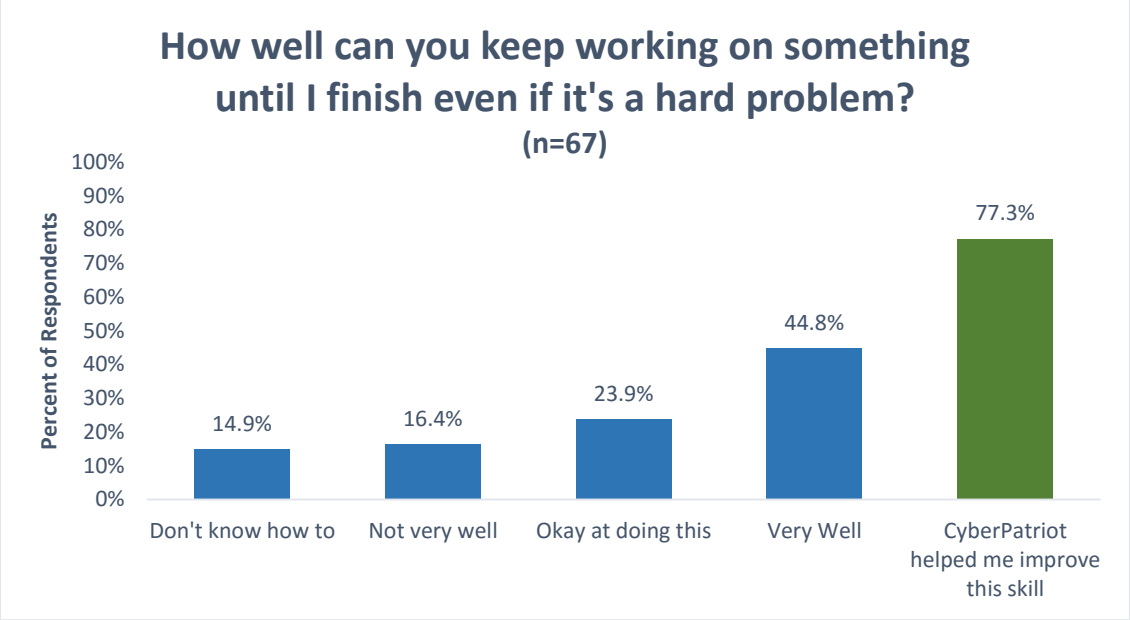

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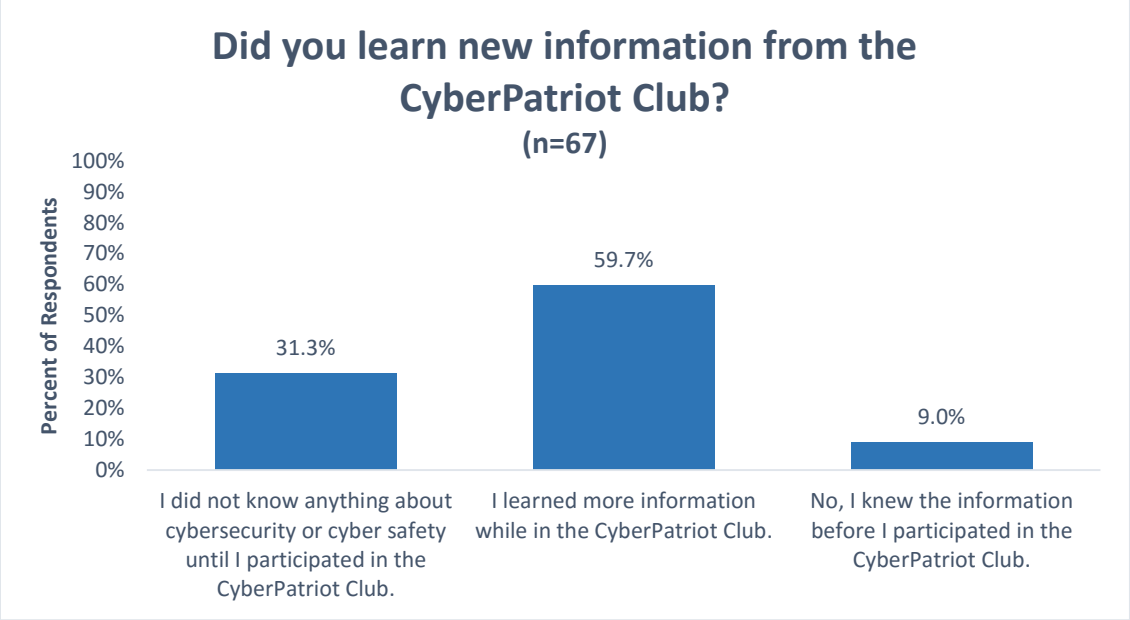

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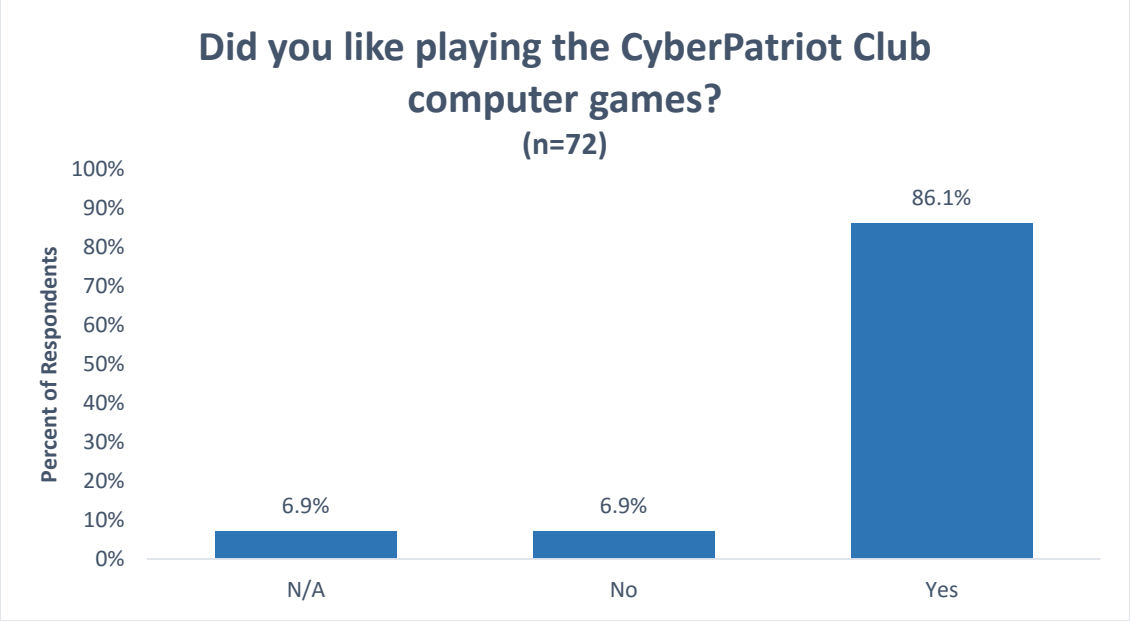

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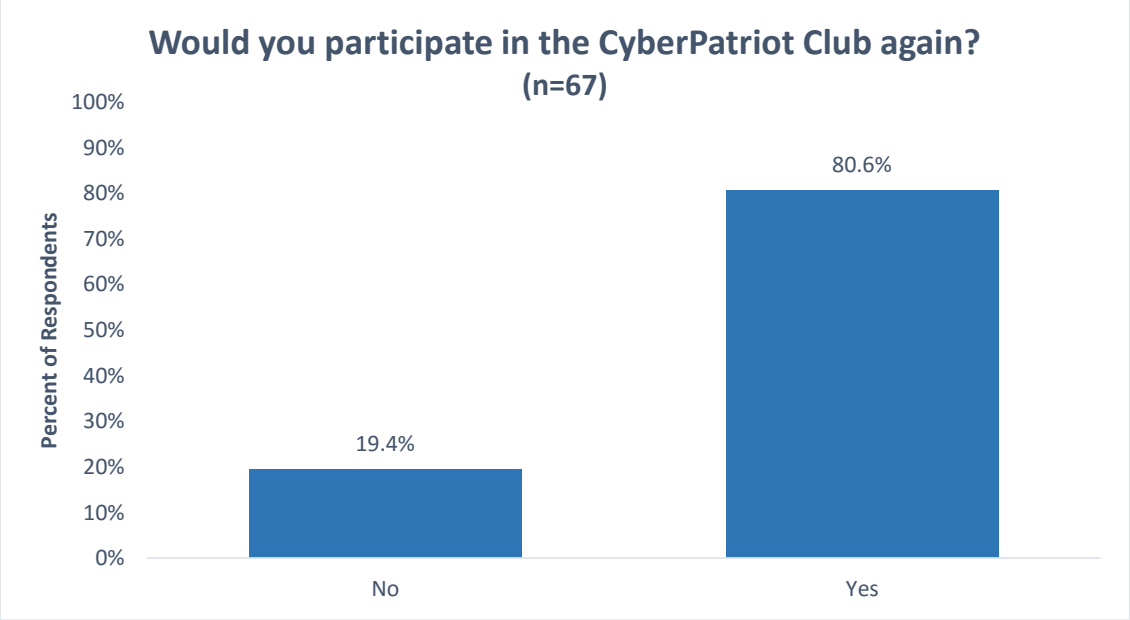

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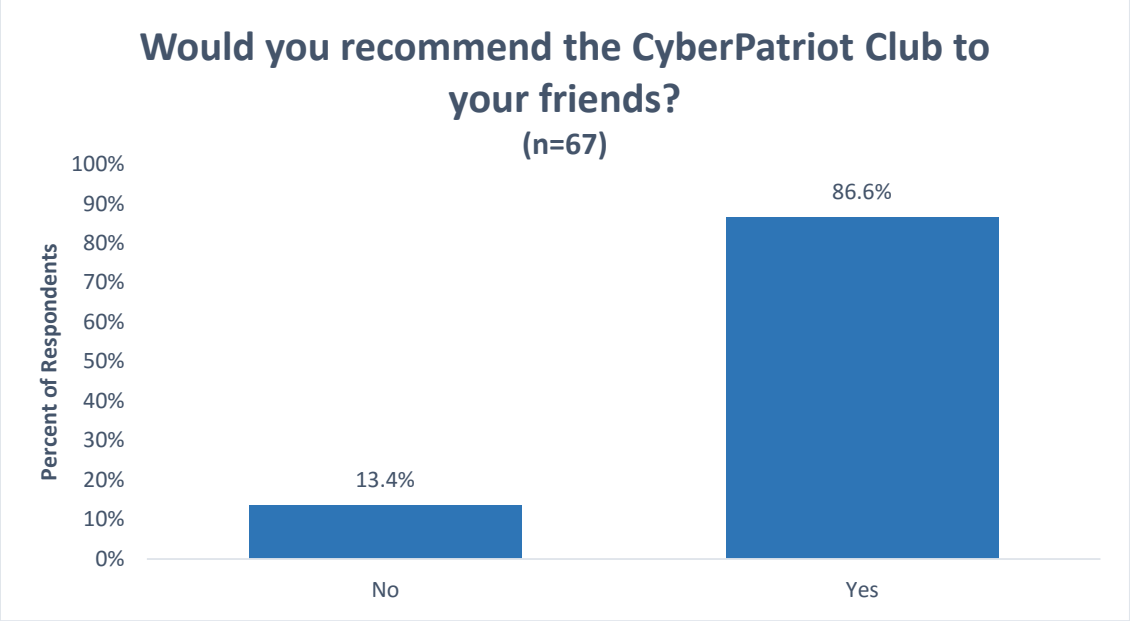
Would you recommend the CyberPatriot Club to your friends?
(n=67)
Percent of Respondents
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
13.4%
86.6%
No
Yes

Student Survey:

Summary of Results

Section 3

Staff Focus Group: Summary of Results

Following the completion of the CyberPatriot Clubs, a focus group of LA's BEST staff members was conducted by an external evaluator. The focus group was held in a conference room at the LA's BEST operations office, and lasted for an hour and a half. Four of the six club facilitators participated (three males and one female). Focus group questions were designed to elicit feedback from club facilitators for the purposes of program improvement. Staff members were asked questions about their overall experience, how they perceived students to experience the clubs, details regarding program implementation, what they learned through the experience, and the culminating event. A summary of staff input is as follows:

Overall Staff Experience with CyberPatriot

All four CyberPatriot instructors said that had a positive overall experience with the program and would implement it again. They described the program as a good experience for elementary students for the following reasons:

- It gives them a head start in technology skills they will need when they have their own computer. This is important as students are getting their own computer or digital devices at younger and younger ages.
- It trains them in specific skills they will need to keep their computer safe (understanding malware, viruses, password strength, etc.).
- LA's BEST is the only place students are getting the opportunity to learn technology skills at this level. Although students are exposed to computers during the regular school day they are not learning the same technology skills they are being taught in CyberPatriot.
- CyberPatriot complements the other after school digital learning classes offered by LA's BEST. One instructor said, "Students are learning something new that is different from anything else."

While the four instructors enjoyed leading CyberPatriot classes, they acknowledged certain challenges. The two most common were:

- Staying ahead of the students with the class materials, games, etc. One instructor said, "Students had fun but it was stressful. Managing time was a challenge. I was learning as I was taught."
- Working with minimal information about the competition and without the competition computers until week before.

Overall Student Experience with CyberPatriot

The instructors observed that students really enjoyed the program and experienced it as fun. They describe students as naturally interested and engaged. Some students who began the class without basic computer skills were challenged or confused at first, but ended the class feeling empowered with new technology skills and by learning how to stay safe online. Overall, instructors observed that students wanted to be in the class and were motivated to learn. One instructor said, "All of the kids wanted to do it."

Comments made by individual instructors regarding students' experience in CyberPatriot included:

- My kids enjoyed it. The stressful part for students was working on the computers because students were not sure how to answer the questions.
- The kids didn't understand many computer basics at first. They wanted to play games. By the end the kids felt more empowered using a computer. The kids that caught on first helped others.
- The kids mostly wanted to know what they had to do to get to play the games. Overall it was exciting for the kids.
- It was a fun learning experience for students. It was stressful for students when they couldn't do something. We started with learning definitions, then games, then working on computers to prepare for competition. The last part was what got hard for the kids (working on computers to prepare for competition).
- At first, the students were confused. But I was confused, too. Everything was brand new. I was teaching students what I learned the week before. We went over definitions, then played games, then worked on computer skills, which got hard for some students. For example, it was difficult for students to learn how to create a strong password.

According to instructors, CyberPatriot was appealing to students because they:

- Love anything having to do with computers.
- Are excited about playing the games.
- Want the chance to be in a competition and go on field trip.
- Are motivated to win medals and certificates.

Program Implementation

All four instructors agreed that the best time to implement CyberPatriot is during the spring semester after students have taken other digital learning classes that cover computer basics, using the internet, and keyboarding (KidType).

All four instructors implemented the lessons and activities in the order they were presented. They agreed that the presented order was logical and made sense. Students first learn the basics about becoming a digital citizen and staying safe online. Next they learn definitions and play games that help them learn definitions. Finally, they prepare for the competition.

All instructors completed some of the lessons, but some encountered difficulty in doing so. Two of the instructors postponed other activities so that the CyberPatriot Club could meet more than twice a week. This was necessary to complete all of the material within a four-week time frame. Instructors agreed that, ideally, the program could be extended over two months meeting two times per week. The final week would be a competition week with daily training. Computers with scenarios for competition would be available sometime during the first month, so that preparation could be spread out over time rather than limited to the final week.

Strategies used by instructors to make implementation of CyberPatriot activities easier included:

- Teaching other digital learning classes (computer basics, typing) prior to offering CyberPatriot.
- Preparing by playing games ahead of time, learning definitions ahead of time.
- Having kids working in groups, with students helping other students. In a mixed grade setting, teaching upper graders first then lower graders. Also, letting upper graders help teach the lower graders.
- Pairing students to work together when there were not enough computers for all students to have their own.
- Demonstrating things as a whole class on an overhead, first before splitting into groups.
- Adding more physical games to teach cybersecurity concepts.
- Playing matching games to teach definitions.
- Using the lessons that were provided.

Creative teaching strategies or activities that instructors added to the provided curriculum included:

- One instructor created a physical outdoor game to play with students called “virus.” outside. Students put sticky notes on each other to symbolize spreading the virus. She mentioned that other physical games could be created (like students forming a firewall and other students trying to penetrate).
- Another instructor created a visual comparing computers and human bodies and drew analogies about health of the body vs. health of a computer. For example, just as eating junk food can lead to bodily illness, opening junk mail can lead to a computer virus.

Staff Learning

What instructors said they learned from implementing CyberPatriot:

- How to use different teaching strategies.
- How to teach to a wide mix of grade levels.
- How to explain the material and help students understand it (all but one staff knew the computer-related material ahead of time).
- Refreshed computer skills, learned definitions (like firewall, malware, and Trojan horse).

Areas for Improvement

Major challenges noted by instructors were:

- Not having enough computers. One instructor worked around this by showing his screen on the overhead while teaching and then pairing students up at the computers to work in teams. He added that it might actually have been harder if kids had their own computers because there would be more individual questions.
- The games about computer safety were too easy and short. Kids went through levels too fast.
- The most challenging thing for students was preparing for competition. Many elements of competition were not included in the games. Elements of competition were creating and deleting user accounts, setting passwords, installing and uninstalling programs, using the control panel. Students needed more time with the competition computers. Kids expected the competition to be the same content as what they did on the competition computers during the week leading up to it. The competition covered the same concepts but with different specific content. The coaches would just like to know what to prepare students for ahead of time.

Instructors' suggestions for improving implementation of the elementary CyberPatriot program were:

- Provide a common implementation plan at the beginning that allows for individual creativity within a structure, allowing for fewer staff trainings.
- Increase the variety of games for students to play and make them more challenging.
- Create games that require more of the functions that will be required in competition and make them available earlier.
- Make competition computers available earlier in the semester.

Culminating Event

Instructors described the culminating event as rewarding, competitive, and as a showcase. They said that many of the students had not competed before and were nervous about their performance. However, students were ready and excited and it turned out to be fun.

When asked what they liked about the culminating event, instructors' responses included:

- The environment of the Boys and Girls Club helped. Students could play pool or air hockey while waiting for other groups to finish.
- All kids got certificates. Plus, there were medals for finalists and semi-finalists for each round and for two groups of students.
- The speakers: Carey, Julian, Becky and Jennifer talked about the creation of the program.
- Cyberteam shirts. Kids are still wearing them.

When asked what they would change about the culminating event, instructors' responses included:

- The room for the actual competition was too small. Parents couldn't see some of the students and were crowded into a corner with kids working out in the middle of the room at tables.
- Some of the kids were too big to fit into the shirts. There were only small and medium sizes, and no larges.
- The event could be more structured and described further ahead of time so teams know what to prepare for.
- Hold a pre-competition at the site, and then send fewer students to the multi-school competition. This may help the program be able to expand without the competition getting too crowded.