Engaging High School Students Towards a Career in Cybersecurity

A Senior Project

presented to

The Faculty of the Journalism Department

California Polytechnic State University, San Luis Obispo

In Partial Fulfillment

Of the Requirements for the Degree

Bachelor of Science in Journalism

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June 2019

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ABSTRACT

The following study acknowledges the numerous jobs available in cybersecurity and searches for ways to use public relations efforts to engage high school students towards a career in cybersecurity. While the field of cybersecurity is growing and the amount of jobs are increasing, there is currently not enough people pursuing a career in cybersecurity. This lack of professionals is dangerous because there are simply not enough professionals that are seeking to progress the field, and there's not enough people to fight the increasing number of cyberattacks. The main goal for this project was to discover public relations tactics that can be used towards increasing awareness among the next generation of cybersecurity professionals. Ultimately, these findings were then applied to press kits, pitch emails, surveys and other press materials that would be used for California Cybersecurity Institute's event, the California Cyber Innovation Challenge. This event is a statewide high school cybersecurity competition designed to introduce more students to cybersecurity as a future course of study and career. This paper addresses the need for public relations engagement efforts among cyber-focused companies, and how these efforts can be applied to an existing event.

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Chapter 1

Introduction

Statement of the Problem

As people become more reliant on technology in this digital age, the risks regarding cyberattacks are rapidly increasing. Nowadays, many of our everyday products are linked to the internet, therefore creating the potential to be vulnerable to being hacked (Price 2015). While this has created new job opportunities in the field of cybersecurity, there is simply not enough cyber professionals that are furthering cyber safety efforts. Currently, there are large gaps in the conversation of cybersecurity because of the lack of professionals that exist in society (Schnieder, 2013).

One organization that is seeking to change this gap is California Cybersecurity Institute (CCI). CCI is an extension of Cal Poly's Cybersecurity Center and aims to educate the next generation about the cyber workforce by providing students and faculty with a hands-on learning environment. While there are many resources available to students that allow them to be exposed to the world of cybersecurity, not enough people know that these resources exist. That is why a large component to the lack of professionals in the field of cybersecurity can be attributed to students being unaware of it being a career option. For this reason, the CCI holds events such as the California Cyber Innovation Challenge (CCIC) for high school students to be exposed to cybercrime early, and potentially develop an interest in a cybersecurity career path.

To put the problem in perspective, here are a few statistics regarding the field of cybersecurity, as stated by CCI.

- 36,602 unfilled cyber positions in California

- 313,735 vacant cyber positions nationally
- 4 Nation States threatening cyberattacks on California
- California is #1 in victims of cybercrime, as ranked by FBI/1C3
- $450 million in reported losses for California

The problem, however, is getting the attention of high school students and their parents to such opportunities. The CCI provides an opportunity for the next generation to be educated on cyber-related topics and be exposed to hands-on research and experience. The organization provides training, resources, a space for innovation, protection and expertise.

The use of public relations engagement efforts, that will be directly applied to the California Cyber Innovation Challenge, will illuminate the idea of a career in cybersecurity to the next generation of cyber-professionals.

Background of the Problem

While cybersecurity is a growing field with many open jobs, there simply is not enough people pursuing a career in cybersecurity. This gap is dangerous for multiple reasons, including that there are not enough people to fight cybercrimes and there are not enough experts that can educate future generations on a problem that is not likely to go away. This primarily has to do with two factors: the controversy between protection and privacy, and people not being familiar enough with cybersecurity to consider it as a possible career path.

This growing number of jobs in cybersecurity is a direct result of people becoming more dependent on technology. While cyberattacks are becoming increasingly more common, professionals in the field are noticing a resistance towards fighting these crimes. “Strategies to protect youth from potentially problematic online experiences may be met with considerable

resistance as young people may not be ready or willing to accept such interventions" (Byrne, 2011). This resistance ties back to people being unsure of where the line should be between protection and privacy. While many can agree that cybercrime is becoming very common and holds some very serious risks, people are, overall, still uncomfortable with the idea of their information not being private. Risen and Lichtblau explains (2009), "the disclosure of excessive domestic collection of information by the security agency served as a warning against giving it greater control over cybersecurity."

In addition to the divisive issue regarding privacy and protection, the lack of professionals pursuing careers in cybersecurity can also be attributed to the lack of exposure that students have regarding the issue of cyberattacks. A study done that examined the current cybersecurity curriculum model that is used in higher education business schools. After examining 518 schools, it was discovered that only 278 of them offered information systems/information technology. Of those 278 schools, only a mere 27 of them even had cybersecurity programs (Yang, 2017). Without being exposed to the field as a student, there can't be an expectation that the next generation will fill those empty spots in cybersecurity. But as being admitted into colleges becomes more and more competitive, it is more common for the interest in a particular field to be chosen as a high school student. Take for Instance California Polytechnic State University, San Luis Obispo. This university requires students to declare their major before even arriving. Students that are required to do this are going to draw from their past experiences in order to make a decision on what they want to study. That is why exposure at the high school level is so crucial. In fact, there are many free learning resources available for students that take interest in cybersecurity, but the issue is that not many people know that these resources exist (Hosbein, 2019). For that reason, the focus needs to shift towards exposure and

engagement.

Purpose of the Study

With the issue of cybersecurity, privacy and online protection spreading rapidly, there is no better time than now to make the push for students to be exposed to fighting cybercrimes. By studying cybersecurity and high school students' interest in the field, one can use this information in order to develop a language and communication plan that will engage high school students towards being interested in cybersecurity. By combining available information about both cybersecurity and successful public relations engagement practices, press materials, such as press kits, can be created more effectively. Overtime, this could lead to an increase in the number of students that are interested in a career in cybersecurity. The research collected from this study will be applied to the CCI's 2019 California Cyber Innovation Challenge in order to create effective press kits and other public relations materials for both before and after the event.

Setting for the Study

This study will be completed with the use of data collection, implementation of strategic writing, and the creation of press kits for California Cybersecurity Institute (CCI). Additionally, the study will be completed at California Polytechnic State University, San Luis Obispo as a Senior Project. After working with the CCI once before for the purpose of developing a communication plan, this study will focus on an upcoming event: California Cyber Innovation Challenge. This event allows high school students to compete by fighting cybercrime in a "real world situation." The press kits, that will be crafted for both before and after the event's usage, will attract high school students not only to the event, but to a potential interest in the field of

cybersecurity. While many public relations efforts and planned, created and noted, many often go on to be forgotten. That is why this study will focus on public relations engagement efforts that can be applied to both this event and other projects in the future. The number of outlets that publish a story after receiving the press kit will measure the success of the public relations efforts.

Research Questions

The following research questions were created in order to develop a language that can be used in public relations efforts that intrigues people, particularly high school students, towards the field of cybersecurity. The research questions were designed to acquire the best methods in overall engagement efforts, measuring the success of those efforts and creating materials that the CCI can use towards future projects.

1. How can a press kit boost overall engagement and the engagement of high school students?

2. What causes high school students to get involved in a certain field early?

3. How can we use the fact that there is a spike in open cybersecurity jobs to our advantage?

4. How can you measure the success of public relations engagement efforts?

5. What is Challenged Based Learning (CBL) and how can we pitch this to our audience?

6. What are some key strategies involving the language that surrounds the controversial balance between protection and privacy in cybersecurity?

7. How can the efforts used towards this project be applicable to other public relations engagement plans in the future?

8. Why is it that the creation of engagement so crucial for this brand/project?

Definition of the Terms

The following terms are presented to the reader in order to clarify repeated terms, organizations and concepts.

Cybersecurity: the organization and collection of resources, processes, and structures used to protect cyberspace and cyberspace-enabled systems from occurrences that misalign with property rights (Craigen, 2014).

California Cybersecurity Institute (CCI): a robust, multi-agency effort to protect California from future cyber threats through training and research for government, academia, military, law enforcement, first responders and private entities. The CCI is an extension of Cal Poly's Cybersecurity Center, and aims to educate the next generation cyber workforce and provide faculty and students with hands-on research and learning environment.

California Cyber Innovation Challenge: a statewide high school cybersecurity competition designed to introduce more students to cybersecurity as a future course of study and career. The event is designed to engage and support the next generation and is conducted through live-immersive environments that represent real world scenarios. The event will take place from June 21-23. The CCIC impacts students across all demographics and has quadrupled in size over the last four years. For this event, Cal Poly collaborates with organizations already focused on "California for All" such as the Sector Navigators, Mayor's Cup and the Governer's Office of

Business and Economic Development (GO-Biz). The CCIC takes place in a live-immersive environment that represents real-world scenarios.

Challenge Based Learning (CBL): a model of learning where you are being educated by solving real-world challenges and problems. The overall goal is to encourage students to develop a deeper understanding of a particular subject. Many studies have concluded that students can benefit from CBL (Cheung, 2011).

Press Kit: a package of promotional materials that are presented to members of the press to brief them on an event, product, service, candidate, etc. Press kits are commonly used in public relations efforts.

Organization of Study

Chapter 1 includes a statement and background of the problem, a purpose of the study, definitions for frequently used terms and the research questions that were developed. Chapter 2 will outline the use of public relations efforts and how it can boost engagement, specifically the engagement of high school students towards cybersecurity. Additionally, it will dive deeper into the doubts that people have about cybersecurity, in order to develop public relations materials that can be successful in reaching the target audience. Chapter 3 will focus on the methodology of the study. Chapter 4 will discuss the evaluation process regarding the success of public relations efforts, as well as examine the misconceptions that young students have about cyber topics. Chapter 5 will summarize the end of the study and make recommendations to both cybersecurity and public relations professionals on how to apply these findings to future public

relations efforts regarding cybersecurity. The appendix is composed of the created public relations materials such as press kits, pitch emails, media lists, survey results and more.

Chapter 2

Literature Review

This review of the literature outlines the use of public relations efforts and how it can boost engagement, specifically the engagement of high school students. Topics that were reviewed included defining public relations terms, studies the target audience and controversies that surround cybersecurity. Additionally, it seeks to recognize the doubts that people have about cybersecurity, in order to develop public relations materials that can be successful.

Press Kits Boosting Overall Engagement

A press kit is a package of promotional materials that are presented to members of the press to brief them on an event, product, service, candidate, etc. By sending a press kit to members of the press, you can increase the media coverage of a given event or story. Press kits are commonly used in public relations efforts.

However, in order to successfully use press kits to boost overall engagement, there can't be only one. Since we are currently focused primarily on using press kits for event publicity, it is crucial to create a press kit for both pre-event publicity and post-event publicity (Haber, 2007, p. 18-19). A successful event is not one that just gets a good turn out, it is one that is still remembered afterwards.

Additionally, a press kit should be created and should include a news release, a background sheet, a photo/illustration and remarks made by key people at the event in order to be successful.

Filling Jobs in Cybersecurity by Peaking the Interest of High School Students

When looking at how high school students view different career paths, it is important to keep in mind that people, particularly high school students in this case, might not have a clear understanding of what cybersecurity is or the startling statistics that surround it. A longitudinal study of students in an introductory cybersecurity course observed students before, during and after the course. The study found that students did change their views about cybersecurity after completing the course, and many said that they had a positive experience (Bell, 2014). But before students take these courses and/or participate in these events, they first have to sign up. So before peaking the students' interest in a career in cybersecurity, one strategy could be first peaking the interests of the parents. One way to do this could be promoting free resources that students have. In an article posted to CCI's blog, Hosbien points out that many services that educate people on cybersecurity are completely free (Hosbien, 2019). More specifically, it highlights high schools participating in cyber competitions and cybersecurity organizations that provide free learning resources to students.

According to an article done by the *Tribune Business News*, there is one factor that tends to drive how high school students choose their interests and extracurricular activities: college applications (Brigid, 2007). Additionally, in the article, a college counselor advises students to pick two or three things that they have an interest in, instead of having a long list of activities that they are not very invested in. When choosing language that targets high school students and jobs in cybersecurity, we should be reminding our audience that events like the "California Cyber Innovation Challenge" put on by the CCI is something extraordinary for a college application. Some of this strategy has already been used by the CCI in a past press release that

states that their courses follow a "learn by doing" mentality (2018). Because CCI is based in San Luis Obispo, the same city as California Polytechnic State University, they strategically worded their press release to include the university's motto, "learn by doing," something that residents in the city would be able to recognize. Potentially, this could pique the interest of a high schooler in the area that one day hopes to attend California Polytechnic State University.

In addition to peaking interest by using language that speaks to high schoolers that are eager to apply to colleges, the language used should also draw from the tendencies that youth have with current technology. As young people are depending more and more on technology, the language used in the public relations efforts should encourage the youth to educate themselves on strategies that can prevent problematic online situations (Byrne, 2011).

Ultimately, a career path in cybersecurity needs to be highlighted because there is a large need for professionals in the field. Currently, there are gaps in the conversation of cybersecurity because of the lack of professionals that exist (Schnieder, 2013).

Measuring the Success of Public Relations Efforts

Often times, public relations plans are created, executed and completed, but there was no plan put in place for how to measure how successful the project or campaign was. In a research paper in *Communication World,* Nicholson points out that often times, plans are created, noted and then forgotten (Nicholson, 2014). This can mostly be attributed to not being realistic about goals that are developed for a given project. Details can always be added later, so when measuring the success of your campaign, try to consider how much of the goals discussed made it to the finished product.

While measuring the success of public relations efforts is important for any project, it is also important to remember that your methods for measuring one project's or company's success

might not be the same as another's. Above all, it is important to be realistic and credible with your client's expectations and the technique that you use to measure the success of a public relations campaign (Rinrattanakorn, 2012).

Regarding how to ensure that your communication plan is successful and adaptable, Tidwell created a test to identify if you plan is online-friendly (Tidwell, 2014).

1. Define audience personas
2. "Connected" means different things to different generations
3. Communication vehicles should be shareable
4. Communicate with, not at, consumers
5. Having a real-time reaction is critical

In the case of measuring the success of public relations efforts that seek to increase the interest that high schoolers have in cybersecurity, there are multiple routes that can be taken. Much like the study that analyzed students before and after completing a cybersecurity course, the CCI could survey high school participants on their thoughts before and after the innovation challenge. Additionally, because CCI is still growing, success can be measured by the amount of publications that choose to write a story about the innovation challenge after receiving the press kit.

Pitching Challenge Based Learning

When reviewing the literature regarding this topic, a somewhat common theme that was popping up was the concept of Challenge Based Learning (CBL). CBL is a model of learning where you are being educated by solving real-world challenges and problems. This approach promotes hands-on learning, collaborating and brainstorming. After reading about this

framework, it was apparent that the CCI's "California Cyber Innovation Challenge" falls into the category of CBL. In fact, one study that was done on the effectiveness of CBL focused on events that are very similar to the event that CCI is putting on. One of these being the "International Conference on Security and Management." During this conference, students competed by working together to solve a cyberattack problem (Cheung, 2011). Cheung concluded that students can really benefit from a CBL approach.

Another study, completed by *The New Media Consortium,* aimed to identify how effective CBL can be by following 6 schools in different locations of the United States that all implemented the CBL technique. The results showed that CBL is very effective, especially in 9th grade (Johnson, 2009, p. 1-38).

Right there, that is the pitch for CBL, because when you are targeting high school students you are not only targeting them, you are also targeting their parents. By pitching CBL, parents will want their children to get involved in events and activities that they believe can further their educational potential.

Balancing Protection and Privacy in Cybersecurity

The trickiest part about developing the language used in public relations efforts for cybersecurity is balancing the concepts of both protection and privacy. While people want to feel like their technology usage is safe, they also want to know that their information is still private. The United States as a whole is increasing cybersecurity efforts, which has proven to make the debate between protection and privacy more controversial (Price, 2015). Price explains that while many people associate common cybercrimes with stealing credit card information, attacks can occur through anything that is linked to the internet. Nowadays, many of our everyday products are linked to the internet, therefore creating the potential to be vulnerable to

cyberattacks. While discussing cybersecurity in campaigns, press releases and any other public relations related project, it is absolutely crucial to remember that the line between privacy and protection is fine.

Therefore, it is ok to acknowledge the concern of privacy as long as you are really emphasizing the concern for protection. As technology is rapidly progressing and emerging so are the dangers of being "hacked" (Wortham, 2015).

Application of Public Relations Efforts to Future Projects

One of the most important things to keep in mind while developing a communication plan is allowing room for change. By creating it in such a way that allows for change, you are allowing it to be applied to projects in the future, not just what you are working on now (Aiello, 2014). When working on a public relations project, you are most likely developing a communication plan, or there is one already in place. If a communication plan is already in place, it is important to follow it so that the brand's voice can be consistent. By keeping the same voice, your brand will grow stronger, and the materials you create will be reusable, at least in some sense.

Engagement is Crucial for CCI

While overall engagement is an important component to any public relations topic, I wanted to discover what makes successful engagement so crucial to this brand in particular. While this particular project is focusing on the promotion of one event that CCI puts on, it is still important to look at the bigger picture. Not only should this project increase engagement, it should jumpstart opportunities for stronger engagement later on, both for CCI and other cybersecurity-focused companies. Currently, CCI is not consistently active on social media.

However, social media just might be the reason that engagement is so crucial for this brand. Social networks are not only used for entertainment, it can be a tool used to create a bridge between teaching, research, sharing information (Marino, 2016).

Chapter 3

Methodology

This chapter will be used to discuss the methods of data collection containing data sources, collection and presentation. Additionally, the limitations and delimitations of the data collection will be discussed.

Data Sources

For this study, high school students will be anonymously surveyed. The questions asked on this survey will seek to answer the research questions and determine possible best public relations practices for engaging this particular audience. The survey will also reveal the existing amount of exposure that the topic of cybersecurity currently has with high school students, and whether the term "cybersecurity" holds positive or negative connotations. The survey results will then be analyzed in terms of public relations effort.

Participants

The participants for this survey will be members of the California Cyber Innovation Challenge's target audience. Survey participants will be high school students, grades 9th through 12th, and come from a top-rated, public high school in California. This high school is similar to the high schools that usually participate in this event, and therefore will provide relevant and anonymous data.

Survey Design

The survey design was based on what would be most effective in answering the provided question. The survey begins with asking the students to fill in what year in school they are, which allows for the data to be organized by year in school. The rest of the eight questions were

written in a way that will provide answers to the proposed research question. More specifically, the results will be a tool used to create a language that will engage high school students, that will then be applied to the created press kits. These questions consist of multiple choice, check all that apply and short answer.

The following questions were asked of the survey participants and served as data sources for the study:

1. What year in school are you?
    a. 9th grade
    b. 10th grade
    c. 11th grade
    d. 12th grade

2. What causes you to sign up for an event and/or activity?

. I participate in activities that I am passionate about

a. I participate in activities that I think will look good on a college application

b. My parents pick my activities

3. Have you already chosen a career path?

. Yes

a. No

b. Maybe

4. If someone told you about a professional field that has a significant amount of open jobs, would you be more interested in that field?

. Yes, it's important to me that the industry I pursue has job security

a. Maybe, if it is similar to what I already want to do

b. No, I know what I want to do

5. Do you prefer hands-on learning or textbook learning?

. Hands-on

a. Textbook

6. Are you (generally speaking) familiar with cybersecurity?

. Yes

a. No

b. I’m not sure

7. In your own words, what is cybersecurity?

. Short answer option

8. Overall, do you have positive or negative connotations about cybersecurity? Why?

. Short answer option

9. When browsing online, what kind of articles interest you?

. Short answer option

Data Collection

Data collection for this study was conducted by sending a shareable Google Forms link to students and classes at the participating high school. The questions on the survey were mostly qualitative questions, such as what kind of connotations they have about cybersecurity. The design of the survey's purpose was to use the results as a tool towards developing a language that engages the target audience.

Data Presentation

The collected data from this survey was included in a chart created by Google Forms. This service also allows readers to look at the charts based on the year they are in high school, whether or not they are familiar with cybersecurity and more. The data presentation provides a clear way to view how high school students view cybersecurity.

Limitations

There are limitations to this study based on the amount of time available to conduct the research and overall project. The timeline of this project is assigned to follow the California Polytechnic State University, San Luis Obispo quarter system, which is a ten-week long period for each quarter. The amount of research done for this study was limited due to the time restraint. In particular, the timeline given for the survey was one week. Another issue was the fact that the event that this project revolves around takes place after the available timeline, therefore making it impossible to survey the students that are actually participating in the California Cyber Innovation challenge.

Delimitations

Due to time and accessibility constraints, delimitations were also present in this study. Because the event takes place after the timeline for this project is over, the press kit designed for after the event takes place will have to leave gaps for the marketing and communications team to fill in. These gaps may include the attendance at the event, quotes from employees and attendees and the overall success. Additionally, the accessibility of high school students that would be willing to participate in a survey for this study also proposed a delimitation. For this reason, the students surveyed will all come from the same high school. The profile of said high school will match that of the typical schools that participate in the California Cyber Innovation Challenge.

Chapter 4

Data Analysis

Chapter 4 will provide an explanation to how strategy was implemented for the press releases for the California Cybersecurity Institute's California Cyber Innovation Challenge (CCIC), as well as the primary audiences' predetermined ideas regarding cybersecurity. The data will summarize what causes high school students to get involved in a certain field, what they believe cybersecurity is and whether or not they are currently interested in a career in cybersecurity. This data will be crucial when creating press kits for CCIC because the language should attract the target audience, high school students. The results from this survey will be compared to the research findings in the review of the literature. Lastly, the pre-established research questions will be answered using the survey results and/or the literature and the main takeaway from these answers will be identified.

Public Relations Action Plan

The goals for this project are to raise awareness for both the brand and this particular event, as well as attract the next generation to a career in cybersecurity. The purpose for the California Cyber Innovation Challenge is to raise up the next generation of cybersecurity professionals by increasing their cyber fluency, professional experience and interest in digital forensics. By implementing public relations efforts through the creation of press kits, the CCI will raise awareness for the amount of available jobs in cybersecurity and inspire the next generation of cybersecurity leaders. Using the information that was gathered through the literature review and survey, press kits will be strategically sent out to applicable media outlets.

Tactics and Tools

The public relations plan for the California Cybersecurity Institute is composed of four main tactics. These tactics include using press materials that are composed of a language that attracts the primary audience and seeks approval from the secondary audience, strategic pitching, the use of a resonating aesthetic and a survey for participating students.

After analyzing the survey results done for this project, high school students remain as the primary audience for the creation of public relations materials. However, it is important to keep in mind that the approval of the secondary audience, parents, is just as important. After asking high school students what causes them to get involved with a subject or activity, 81.8% answered that they choose activities that they are passionate about and 72.7% answered that they choose based on what they believe will look good on a college application. Interestingly enough, 0% of surveyed high school students answered that they participate in activities chosen for them by parents. This discovery calls for a shift attracting parents towards the event to simply seeking their approval.

The next tactic will be strategic pitching. In order for the publicity efforts to be successful, a spreadsheet will be developed for the CCI that provides a breakdown for media outlets that surround the participating high schools, as well as their pitching contact information. This tool will allow for a more strategic and organized pitching process, and should result in a higher success rate regarding how many media outlets pick up the story. Aside from pitching to just local news outlets, press kits will also be sent to the participating schools so that they may have the option to share about the event through school newspapers, magazines, newsletters and digital platforms. For these pitches to be successful, they will be sent to the target outlets along with a personal email that highlights their local schools' participation in CCIC.

Another tactic will be the use of a resonating aesthetic. CCI is in a unique position design-wise because it is technically a subdivision of Cal Poly, San Luis Obispo, therefore following Cal Poly's branding model. However, Cal Poly is in the middle of a rebrand, leaving space for the CCI to develop an aesthetic that both abides to Cal Poly's design guidelines and matches their own brand. The press kits will be developed in InDesign for a professional and clean look, and will follow Cal Poly's current, but soon to be outdated, design guidelines. In addition to Cal Poly's guidelines, the press kits will include engaging, cyber-themed graphics that ever so slightly break the mold of Cal Poly's current branding. Because Cal Poly's redesign will be officially launched in July, a month after CCIC, the press kits will be designed in a way that will be easy to edit so that they may be updated after the redesign launch.

The last tactic will be surveying participating students. While these survey results will be completed outside of the pre-established timeline for this research, the CCI will be able to use these survey results to gain a deeper understanding of what attracts the next generation to cybersecurity. A sample survey is provided in the appendix for viewing.

Communication with Publics

For effective publicity efforts, it is crucial to effectively communicate to the future generation of cybersecurity professionals. The idea of Challenge Based Learning (CBL) that was discussed in chapter 2 of the literary review both aligns with Cal Poly's learn by doing mentality and promotes a style of learning that is beneficial to high school students.

Branding CCI in a way that aligns with Cal Poly was achieved by following the Cal Poly color schemes and typeface guidelines as well as incorporating the Cal Poly logo. Because Cal Poly will undergo a redesign a month after CCIC takes place, the press kits were designed in a

way that limited the use of the current, and soon to be outdated, Cal Poly logo, so that it will be easy to update for future use. By limiting the amount of Cal Poly visual materials in the press kits, the CCI is able to have a connected, but still individualized brand image. This unique image was also achieved through displaying shocking statistics in a creative way and incorporating cyber-themed visual components.

In addition to the exit survey that will be provided at the end of the event, the success of the event will be measured by the amount of media outlets that report on CCIC. Because participants will be coming from all over California, the goal of pitching to outlets surrounding the participating schools not only gets the word out about CCI, but it also will increase awareness for a career path in cybersecurity.

By completing a small, yet effective, survey before the event and creation of the press kits, there is now data that displays answers to the research questions stated in chapter 2. These survey results assisted in creating a language on the press kits that might engage high school students, provided insight to the CCI on how to spark an interest in a career in cybersecurity for students stated pre-established ideas that students have about cybersecurity. Below is an infographic that displays these anonymous survey results.

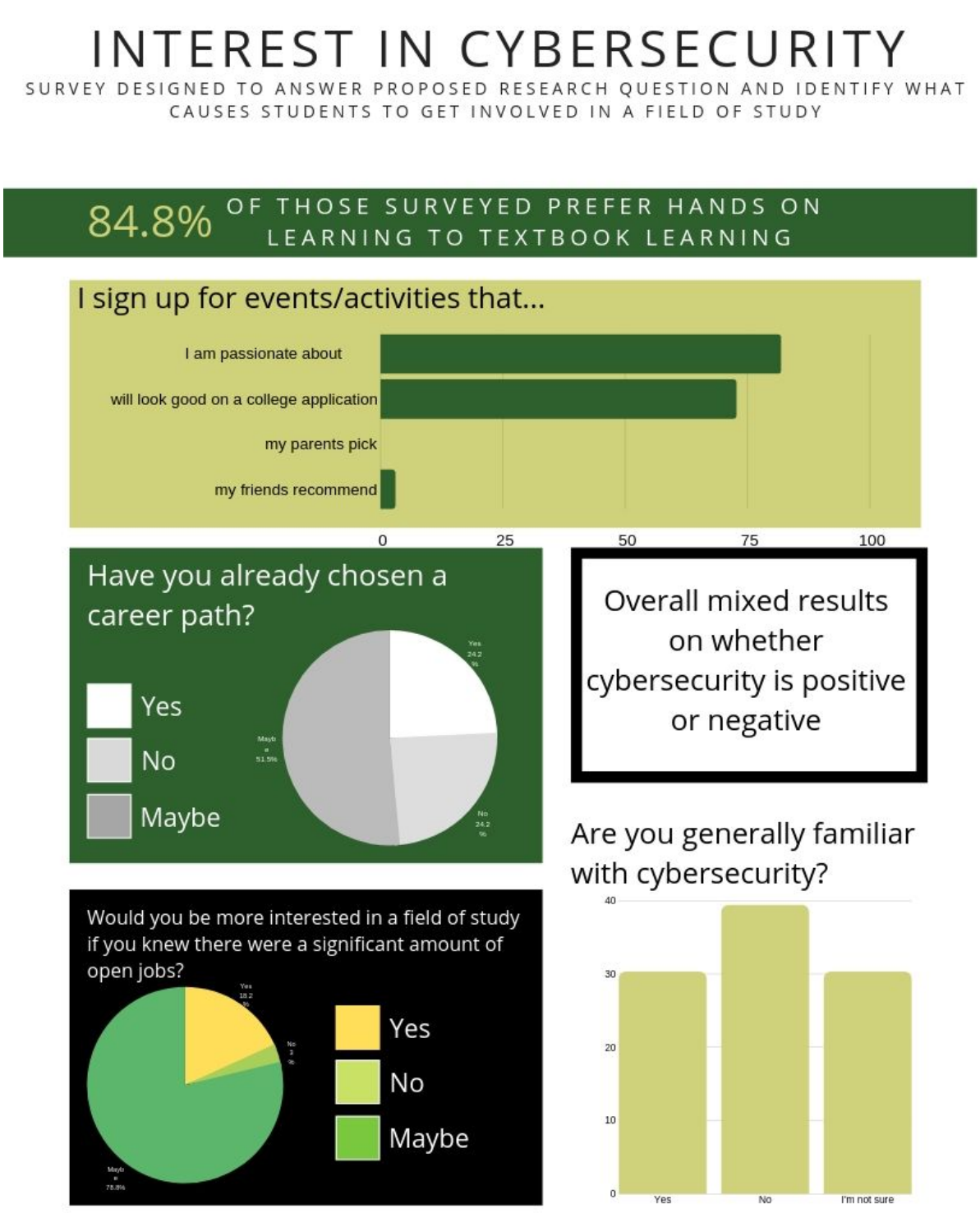

Figure 1: Interest in Cybersecurity survey results

Research Questions

Before reviewing literature, collecting data and creating public relations materials for CCIC, research questions were created in order to develop a language that can be used in public relations efforts that intrigue high school students towards a career in cybersecurity. The research questions were designed to acquire the best methods in overall engagement efforts, measure the success of those efforts and creating materials that the CCI can use towards future projects. Because these questions seek to answer both how to engage high school students and best practices for CCI, they are not all answered using the same tactic. Outlined below is both the determined answer to each research question and how each given question was ultimately answered.

Research Question #1: How can a press kit boost overall engagement and the engagement of high school students?

- How this question was answered: literature review
- In order to successfully use press kits to boost overall engagement, there can't be only one. Since we are currently focused primarily on using press kits for event publicity, it is crucial to create a press kit for both pre-event publicity and post-event publicity (Haber, 2007, p. 18-19). A successful event is not one that just gets a good turn out, it is one that is still remembered afterwards.
- <u>The takeaway:</u> Based on this information, this project included both a press kit for before the event and a template for a press kit that could be sent out after the event takes place. By having a press kit for both before and after a given event, the awareness of a given story or event can be increased.

Research Question #2: What causes high school students to get involved in a certain field early?

- How this question was answered: survey
- As displayed in figure 1, 81.8% of students surveyed answered that they get involved in activities that they are passionate about and 72.7% said that they base their involvement on what they believe will look good on a college application.
- The takeaway: public relations materials that aim to attract high school students should highlight the professional benefits

Research Question #3: How can we use the fact that there is a spike in open cybersecurity jobs to our advantage?

- How this question was answered: survey
- Only 3% of the high school students that were surveyed answered that hearing that a certain professional field has a large number of open jobs would not affect their interest in a career. This demonstrates that even while still in high school, job security in a field may be a factor in their field of study decision.
- The takeaway: public relations materials that aim to attract high school students should highlight that there are thousands of open jobs in cybersecurity in California alone. The lack of professionals in the field should be addressed because this may lead more students to pursue a career in cybersecurity.

Research Question #4: How can you measure the success of public relations engagement efforts?

- How this question was answered: literature review

- As pointed out in a research paper in *Communication World,* public relations plans are often created, executed and completed, but then there is no strategy put in place for how to measure the success of public relations efforts (Nicholson, 2014). With this in mind, a plan for how to measure the success of the efforts put into this project was identified early on.
- Regarding how to ensure that your communication plan is successful and adaptable, Tidwell created a test to identify if you plan is online-friendly (Tidwell, 2014).
    1. Define audience personas
    2. "Connected" means different things to different generations
    3. Communication vehicles should be shareable
    4. Communicate with, not at, consumers
    5. Having a real-time reaction is critical
- <u>The takeaway:</u> it was identified early on in the project that the success of this project would be measured through a survey that was designed for CCIC participants to complete after the event, and overall media coverage through outlets that the press kits were sent to.

Research Question #5: What is Challenged Based Learning (CBL) and how can we pitch this to our audience?

- <u>How this question was answered:</u> literature review and survey results
- CBL is a model of learning where you are being educated by solving real-world challenges and problems. This approach promotes hands-on learning, collaborating and brainstorming.

- Multiple studies that were discovered in the literature review phase of this project discovered that CBL is very beneficial to students, specifically those in high school.
- One study, completed by *The New Media Consortium,* aimed to identify how effective CBL can be by following 6 schools in different locations of the United States that all implemented the CBL technique. The results showed that CBL is very effective, especially in 9th grade (Johnson, 2009, p. 1-38).
- When asked, 84.8% of survey participants answered that they prefer hands on learning to textbook learning.
- The takeaway: When you combine the research that proves the benefits of CBL to the data that shows that students prefer hands on learning, it is apparent how strong of a pitch CBL is to both students and parents. Therefore, public relations efforts that engage people towards cybersecurity should discuss CBL and why it is so beneficial. Additionally, these efforts should make it clear to students that experience in cybersecurity will be very hands on, the preferred type of learning.

Research Question #6: What are some key strategies involving the language that surrounds the controversial balance between protection and privacy in cybersecurity?

- How this question was answered: survey results
- Below you will find the short answers that students provided when asked "Overall, do you have positive or negative connotations about cybersecurity?

Positive	Negative
Positive, I want to keep my identity safe	negative because it's commonly associated with invasion of privacy

Positive because I have not been hacked	Negative, because there are so many cases we hear about breach in cybersecurity
Positive because it helps people	Negative, because I'm not as aware of the dangers online and what I need to do to protect myself. I honestly just don't like thinking about it.
Positive, sounds like to will protect money	Negative, government likes to spy
Positive because it prevents my computers from getting viruses	Negative. There are lots of sketchy stories about privacy violations.
Positive because it is security so it's helpful	Negative as it means identity theft
I have a positive connotation because I want my personal information kept safe.	Negative because of all the news about hacking
Generally positive. Protects consumers and workers alike.	Negative

Table 1: Survey answers to "overall, do you have positive or negative connotations about cybersecurity?"

While there were other responses that recognized both positive and negative connections, a majority of the answers stayed on one side of the controversial topic.

- The takeaway: Many people that associate cybersecurity with negative connotations are not familiar with the positive attributes. Because of this, communication plans, press kits, campaigns and other public relations efforts for cybersecurity brands should be upfront about the privacy concerns that surround cybersecurity. From there, these materials should discuss how the benefits of more cybersecurity efforts outweigh the common privacy concerns.

Research Question #7: How can the efforts used towards this project be applicable to other public relations engagement plans in the future?

- How this question was answered: completing the project
- Every public relations project is different and comes along with unique circumstances. Some of the circumstances for this particular project included the following:
    - Cal Poly being in the middle of a rebrand
    - Strict timeline for the completion of this project
    - The actual event taking place outside of the allowed timeline for the project.
- The takeaway: With these circumstances in mind, the press kits that were created had to be designed in a way that would allow for it to be easily altered. While the exact materials created for this project may never be used again by the CCI, the strategic language and writing that was applied can be applied for all future materials. Additionally, the strategies that were identified regarding how to engage the future generation can be applied to any of their campaigns that are geared towards students. Not only should this project increase engagement, it should jumpstart opportunities for stronger engagement later on.

Research Question #8: Why is it that the creation of engagement is so crucial for this brand/project?

- How this question was answered: literature review
- Currently, there are gaps in the conversation of cybersecurity because of the lack of professionals that exist (Schnieder, 2013). In other words, the field is struggling due to lack of engagement. Because the CCI's mission is to "educate the next generation cyber workforce and provide faculty and students with a new, hands-on research and learning

environment," boosting engagement around the topic of cybersecurity is absolutely crucial.

- The takeaway: Boosting overall engagement is arguably a goal for all public relations efforts, but for this brand the creation of engagement is crucial because it revolves around a topic that many people do not understand. By boosting overall engagement, the CCI can get one step closer towards educating the cybersecurity leaders of tomorrow.

Chapter 5

Discussions and Recommendations

Summary

The press kits and other public relations efforts for California Cybersecurity Institute's (CCI) California Cyber Innovation Challenge (CCIC) was created by a Cal Poly journalism student who saw a need for raising awareness for the numerous available jobs in the field of cybersecurity. By looking into how to target a high school audience through public relations efforts, this Cal Poly student created communication materials that can be continuously used by CCI and potentially other cyber-focused companies. CCIC is a high school cybersecurity competition that is designed to introduce students to a potential career or course of study. The purpose of this study conducted over the past ten weeks was to successfully create press materials that would increase engagement for CCI and to gain a strong understanding of what attracts young students to a career early. These findings were then used to create press materials that can more effectively attract the target audience.

In order to determine strategies to increase engagement, the research for this project focused on answering the following questions:

1. How can a press kit boost overall engagement and the engagement of high school students?
2. What causes high school students to get involved in a certain field early?
3. How can we use the fact that there is a spike in open cybersecurity jobs to our advantage?
4. How can you measure the success of public relations engagement efforts?
5. What is Challenged Based Learning (CBL) and how can we pitch this to our audience?

6. What are some key strategies involving the language that surrounds the controversial balance between protection and privacy in cybersecurity?
7. How can the efforts used towards this project be applicable to other public relations engagement plans in the future?
8. Why is it that the creation of engagement is so crucial for this brand/project?

As previously mentioned, the findings of this study allowed for the creation of effective press kits, sample pitching emails, media lists and an exit survey for students participating in CCIC.

Discussion

By analyzing the data collected from Chapter 4 and making connections through researching the existing literature, it is now possible to make conclusions regarding the original research questions.

Research Question #1: How can a press kit boost overall engagement and the engagement of high school students?

In order to successfully use press kits to boost overall engagement, there can't be only one press kit. Since we are currently focused primarily on using press kits for event publicity, it is crucial to create a press kit for both pre-event publicity and post-event publicity (Haber, 2007, p. 18-19). A successful event is not one that just gets a good turn out, it is one that is still remembered afterwards.

According to the anonymous survey conducted for this study, a majority of high school students sign up for events that they are passionate about and they believe will look good on a college application. When pitching to media outlets, the experience that students can gain from this event should be highlighted.

Based on this information, this project included both a press kit for before the event and a template for a press kit that could be sent out after the event takes place. Additionally, the language used in press materials highlight the benefits of participating in events such as CCIC.

Research Question #2: What causes high school students to get involved in a certain field early?

This question was answered using the survey. As stated in the previous research question's conclusion, a majority of high school students sign up for events that they are passionate about and they believe will look good on a college application. In fact, 81.8% of students surveyed answered that they get involved in activities that they are passionate about and 72.7% said that they base their involvement on what they believe will look good on a college application.
A study done that examined the current cybersecurity curriculum model that is used in higher education business schools shows that we can't depend on students being exposed to cybersecurity careers at the university level. After this study examined 518 schools, it was discovered that 278 of them offered information systems/information technology programs. Of those 278 schools, only 27 of them had cybersecurity programs (Yang, 2017). Without being exposed to the field as a student, there can't be an expectation that the next generation will fill those empty spots in cybersecurity. That is why answering this research question becomes so crucial.

As seen in the study that examined the current cybersecurity curriculum model that is used in higher education business schools,

, this does partly have to do with available resources. Not every school has a cybersecurity company that they have partnered with or even cybersecurity opportunities at all.

With this information, it can be concluded that what attracts high school students is available resources and opportunities that can strengthen their college applications. That being said, public relations materials that aim to attract high school students should highlight the professional benefits.

Research Question #3: How can we use the fact that there is a spike in open cybersecurity jobs to our advantage?

This question was able to be answered through the survey. Only 3% of the high school students that were surveyed answered that hearing that a certain professional field has a large number of open jobs would not affect their interest in a career. This demonstrates that even while still in high school, job security in a field may be a factor in their field of study decision. Additionally, it is important to still consider parents as a secondary audience because they also want to see their children succeed. If cybersecurity is communicated as a field of study with high job security, this will interest both the students and the parents.

While creating public relations materials that aim to attract high school students, these materials should highlight that there are thousands of open jobs in cybersecurity in California alone. The lack of professionals in the field should be addressed in these materials because this may lead more students to pursue a career in cybersecurity.

Research Question #4: How can you measure the success of public relations engagement efforts?

This research question was answered through reviewing the existing literature on the topic. As pointed out in a research paper in *Communication World,* public relations plans are often created, executed and completed, but then there is no strategy put in place for how to measure the success of public relations efforts (Nicholson, 2014). With this in mind, a plan for how to measure the success of the efforts put into this project was identified early on.

Regarding how to ensure that your communication plan is successful and adaptable, Tidwell created a test to identify if you plan is online-friendly (Tidwell, 2014).

1. Define audience personas
2. "Connected" means different things to different generations
3. Communication vehicles should be shareable
4. Communicate with, not at, consumers
5. Having a real-time reaction is critical

It was identified early on in the project that the success of this project would be measured through a survey that was designed for CCIC participants to complete after the event, and overall media coverage through outlets that the press kits were sent to. Due to limitations, these survey results will not be completed in time to contribute to this particular project, but the results can be extremely useful for future cybersecurity engagement projects.

Research Question #5: What is Challenged Based Learning (CBL) and how can we pitch this to our audience?

The answer to this question was identified early on during the literature review stage of the project. Challenge Based Learning (CBL) is a model of learning where you are being educated by solving real-world challenges and problems. This approach promotes hands-on learning, collaborating and brainstorming.

Multiple studies that were discovered in the literature review phase of this project discovered that CBL can be very beneficial to students, specifically those in high school. In particular, a study completed by *The New Media Consortium,* aimed to identify how effective CBL can be by following 6 schools in different locations of the United States that all implemented the CBL technique. The results showed that CBL is very effective, especially in 9th grade (Johnson, 2009, p. 1-38).

While this question was answered through the literature, it was also supported through the conducted survey. When asked on the survey, 84.8% of survey participants answered that they prefer hands on learning to textbook learning. This translates to not only is CBL an effective way of learning, but it is also what students prefer.

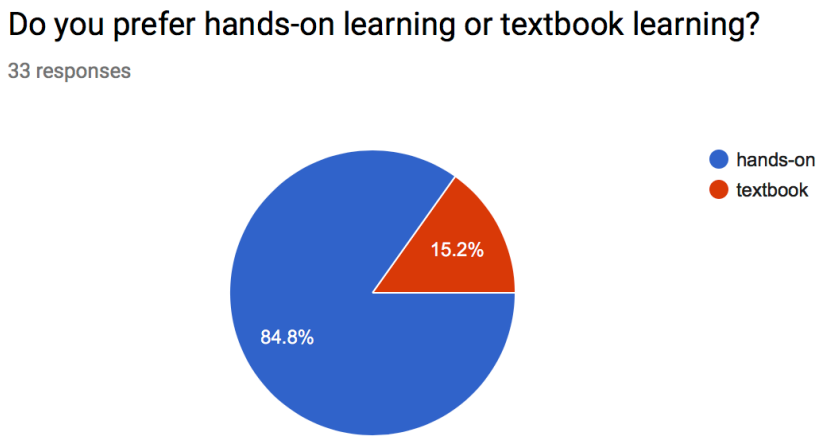

Figure 2: Survey response to "do you prefer hands-on learning or textbook learning?"

When you combine the research that proves the benefits of CBL to the data that shows that students prefer hands on learning, it is apparent how strong of a pitch CBL is to both students and parents. Therefore, public relations efforts that engage people towards cybersecurity should discuss CBL and why it is so beneficial. Additionally, these efforts should make it clear to students that experience in cybersecurity will be very hands on, which is the preferred way of learning.

Research Question #6: What are some key strategies involving the language that surrounds the controversial balance between protection and privacy in cybersecurity?

One of the trickiest parts of dealing with communication that revolves around cybersecurity is the controversy and balance between protection and privacy. While there were other responses that recognized both positive and negative connections, a majority of the answers stayed on one side of the controversial topic. Additionally, many short answer responses did include either being positive because of protection, or negative due to privacy issues. For example, one response to the question, "overall, do you have a positive or negative connotations about cybersecurity?" was "negative, because it's commonly associated with invasion of privacy." However, other responses were positive such as "positive, I want to keep my identity safe."

In other words, the takeaway is that many people that associate cybersecurity with negative connotations are not familiar with the positive attributes. Because of this, communication plans, press kits, campaigns and other public relations efforts for cybersecurity brands should be upfront about the privacy concerns that surround cybersecurity. From there,

these materials should discuss how the benefits of more cybersecurity efforts outweigh the common privacy concerns.

Research Question #7: How can the efforts used towards this project be applicable to other public relations engagement plans in the future?

In general, every public relations project is different and comes along with unique circumstances. Circumstances for this particular project included having only ten weeks to complete the project, Cal Poly being in the middle of a rebrand and the actual event taking place outside of the allowed timeline for this project.

With these circumstances in mind, the press kits had to be designed in a way that would allow for it to be easily altered. While the exact materials created for this project may never be used again by the CCI, the strategic language and writing that was applied can be applied for all future materials. Additionally, the strategies that were identified regarding how to engage the future generation can be applied to any of their campaigns that are geared towards students. The large amount of available jobs is not something that will be fixed in a short period, so projects created by CCI that aim to increase engagement should always keep the findings from this project in mind.

Not only should this project increase engagement, it should jumpstart opportunities for stronger engagement later on.

Research Question #8: Why is it that the creation of engagement is so crucial for this brand/project?

Currently, there are large gaps in the conversation of cybersecurity because of the lack of professionals that exist in the industry (Schnieder, 2013). This gap in the field undoubtedly exists because of the lack of engagement. Because the CCI's mission is to "educate the next generation cyber workforce and provide faculty and students with a new, hands-on research and learning environment," boosting engagement around the topic of cybersecurity is absolutely crucial. But it isn't just crucial for the CCI, it's crucial for the entire field of cybersecurity. If the next generation doesn't start to fill those open jobs in cybersecurity, then the gap will only increase.

Boosting overall engagement is arguably a goal for all public relations efforts, but for this brand the creation of engagement is crucial because it revolves around a topic that many people do not understand. By boosting overall engagement, the CCI can get one step closer towards educating the cybersecurity leaders of tomorrow, which is their entire goal.

Recommendations for Practice

After the completion of this study, a substantial amount of research has been collected on the topic of using public relations efforts to create a stronger engagement for cybersecurity brands. Given the information that has been collected, it is important to highlight the findings that are most applicable to similar public relations efforts in the future.

Be Honest About Controversy

The controversy and balance between protection and privacy regarding cybersecurity does create hesitation. For a lot of people, as seen in the survey conducted for this project, they

either have a negative or positive connotation about cybersecurity. When creating press materials for cybersecurity companies, it is important to both promote the positive and be honest about the negative.

Nowadays, many of our everyday products are linked to the internet, therefore creating the potential to be vulnerable to being hacked, with this in mind, cybersecurity companies should be acknowledging privacy concerns, but also explaining how ultimately the risk outweighs this concern (Price 2015). In order to encourage the next generation to pursue a career in cybersecurity, the audience has to see that the positive outweighs the negative.

Push Challenge Based Learning

Numerous studies have shown how challenge based learning is beneficial to high school students (Cheung, 2011). Additionally, according to the survey, students prefer hands on learning to textbook learning. CCI and other cybersecurity-focused companies utilize challenge based learning, but they don't advertise the benefits. Therefore, public relations efforts for cybersecurity should be pushing challenge based learning because it can propose benefits to students in a learning atmosphere that they prefer.

Focus on Engagement Efforts

While there are many resources available to students that allow them to be exposed to the world of cybersecurity and a potential career in the field, not enough people know that these resources exist. Therefore, the lack of professionals in the field can be attributed to the lack of engagement efforts. Students are simply unaware that a career in cybersecurity is an option.

While hosting events such as the CCIC is definitely a great start, simply having the event is not enough.

Remember, the goal is not to be heard by everyone, the goal is to be heard by future cybersecurity professionals. With that being said, focus on using a language that actually engages this audience. For example, as young people are depending more and more on technology, the language used in the public relations efforts should encourage the youth to educate themselves on strategies that can prevent problematic online situations (Byrne, 2011).

Additionally, it is recommended to survey your audience after an event. A longitudinal study of students in an introductory cybersecurity course observed students before, during and after the course. The study found that students did change their views about cybersecurity after completing the course, and many said that they had a positive experience (Bell, 2014). With events such as CCIC, it's important to see what engaged your audience and what didn't, and the best way to accurately discover what worked is by asking your audience directly.

Survey Your Audience

The best way to determine how to engage your target audience is to survey them directly. The survey that was completed for this project was immensely helpful when it came time to develop public relations materials for CCIC. Though this event takes place outside of the timeline for this project, a sample exit survey was created and sent to CCI as a portion of this project. Questions on this survey include:

- How did you hear about this event?
- Did you have any experience with cybersecurity prior to this event?

- After participating in this event, are you interested in studying cybersecurity in the future?
- This event utilized challenge based learning, would you say that you prefer this hands-on learning to textbook learning?
- Would you participate in this event again?

By asking these questions, CCI will be able to continually develop a communication plan to engage high school students. A full version of this survey can be viewed in the appendix.

Conclusion

In conclusion, the findings in this study will provide communication and public relations professionals with recommendations on how to engage students, particularly towards a career in cybersecurity. With the issue of cybersecurity, privacy and online protection spreading rapidly, there is no better time than now to make the push for students to be exposed to fighting cybercrimes. The hope is that by exposing more students to cybersecurity, the smaller the gap will be regarding cyber-topics. By studying cybersecurity and high school students' interest in the field, one can use this information in order to develop a language and communication plan that will engage high school students towards being interested in the field. Using this information, it was possible to make public relations materials, such as press kits, pitch emails, media lists and exit surveys, that will successfully engage the right audience.

Overall, the study presented findings through a survey and review of existing studies and literature. The study can be used as a tool, by cybersecurity and public relations professionals, who wish to increase engagement. By using public relations efforts as means of reaching the

target audience, cybersecurity and public relations professionals should be able to take a step closer towards filling jobs in cybersecurity.

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Appendix A: Figures

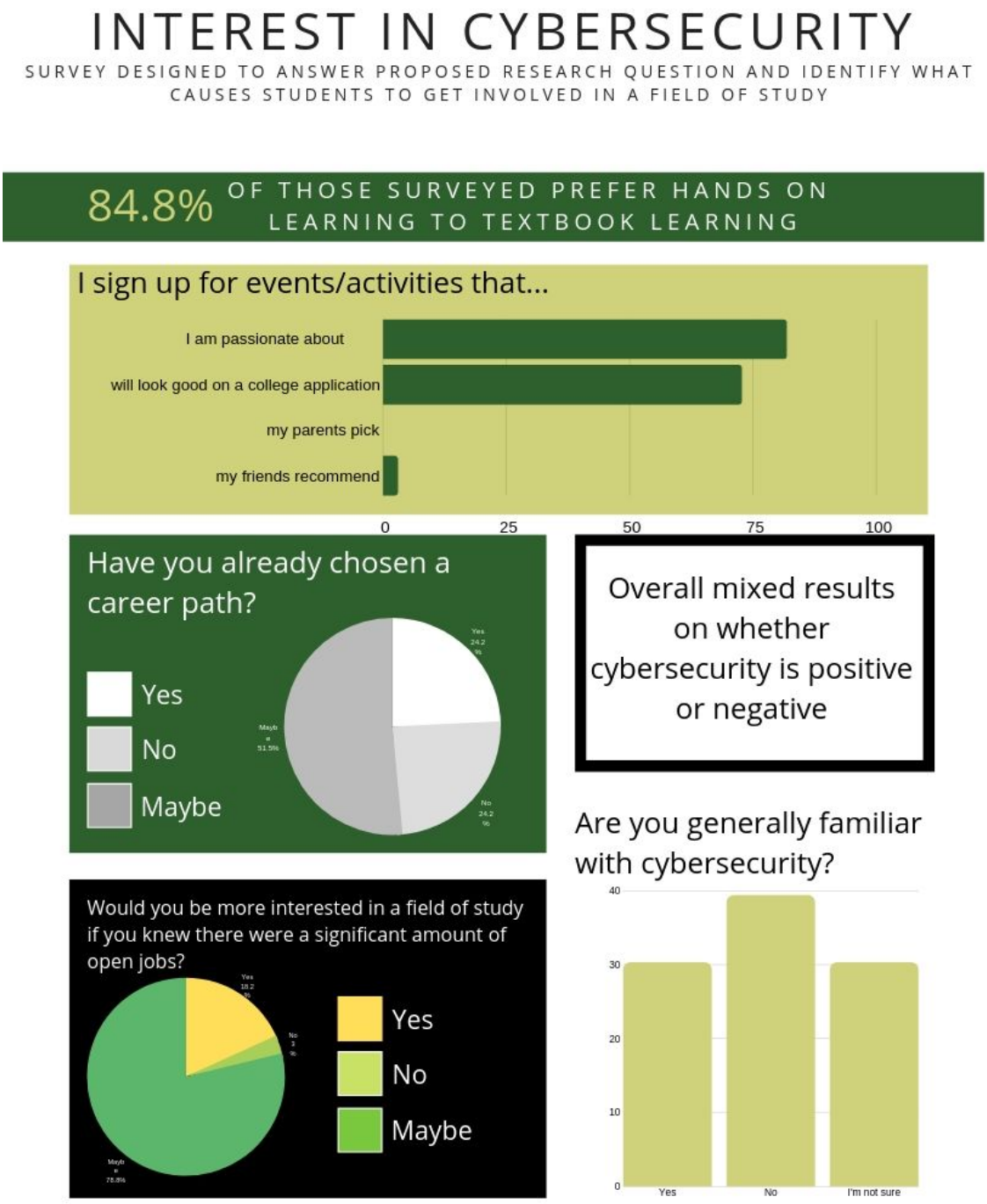

Figure 1: Interest in Cybersecurity survey results

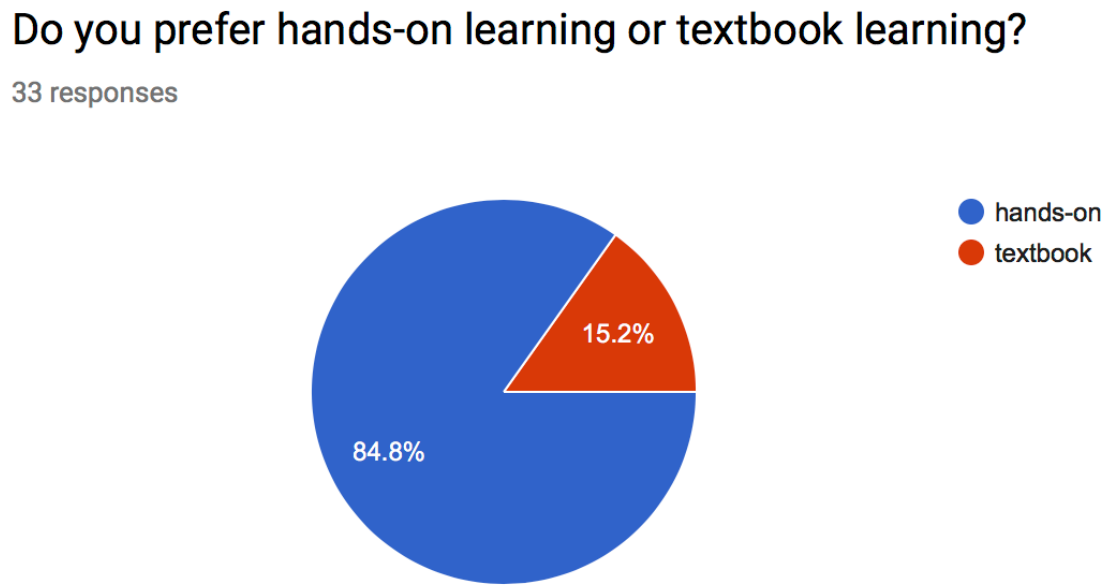

Figure 2: Survey response to "do you prefer hands-on learning or textbook learning?"

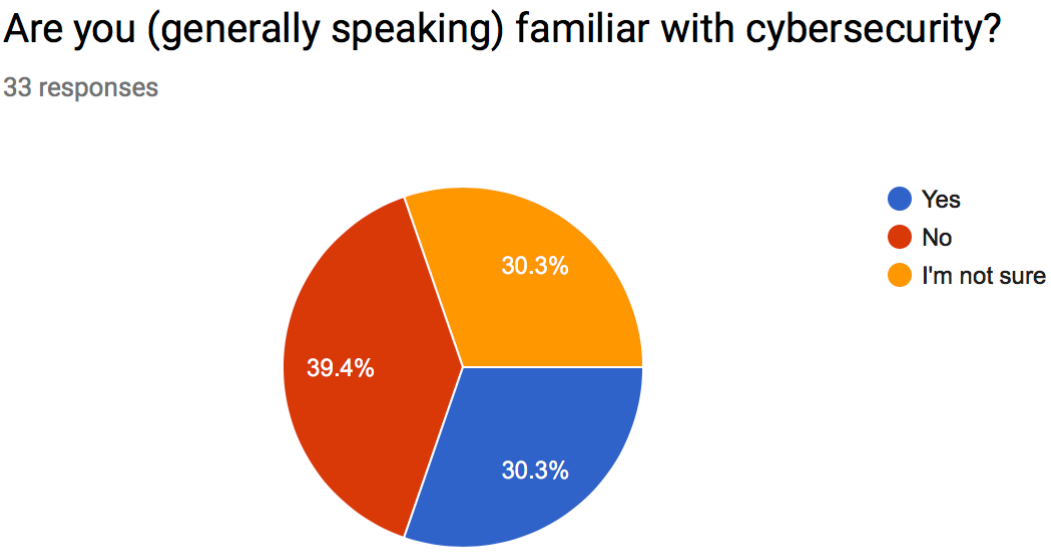

Figure 3: Survey response to "are you familiar with cybersecurity?"

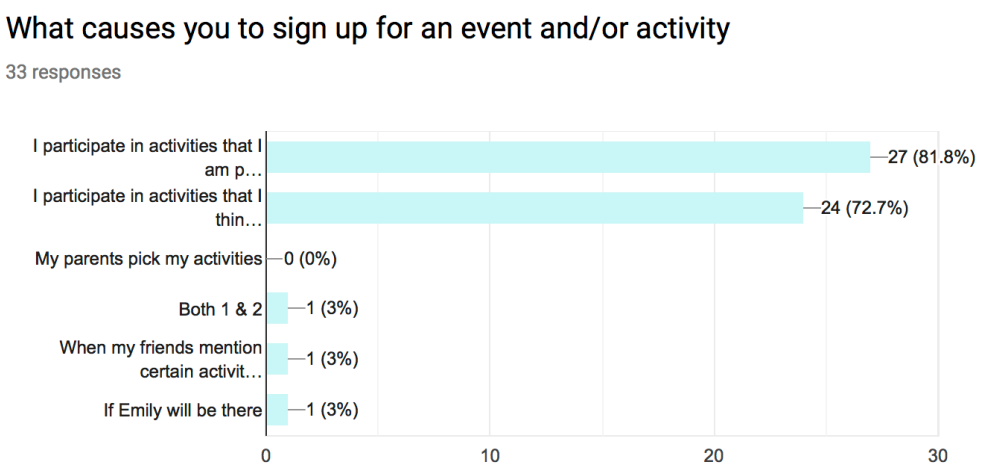

Figure 4: Survey response to "What causes you to sign up for an event and/or activity?"

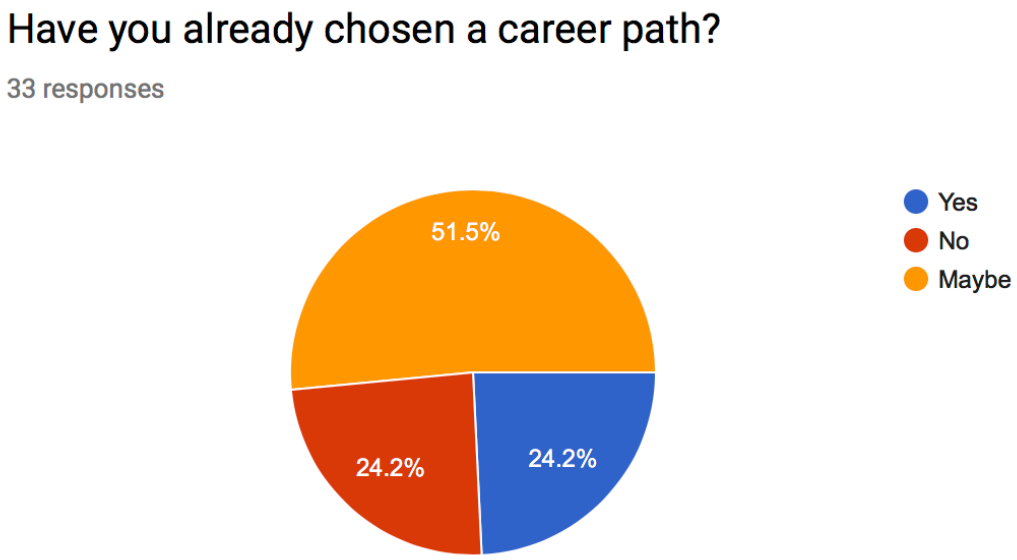

Figure 5: Survey response to "Have you already chosen a career path?"

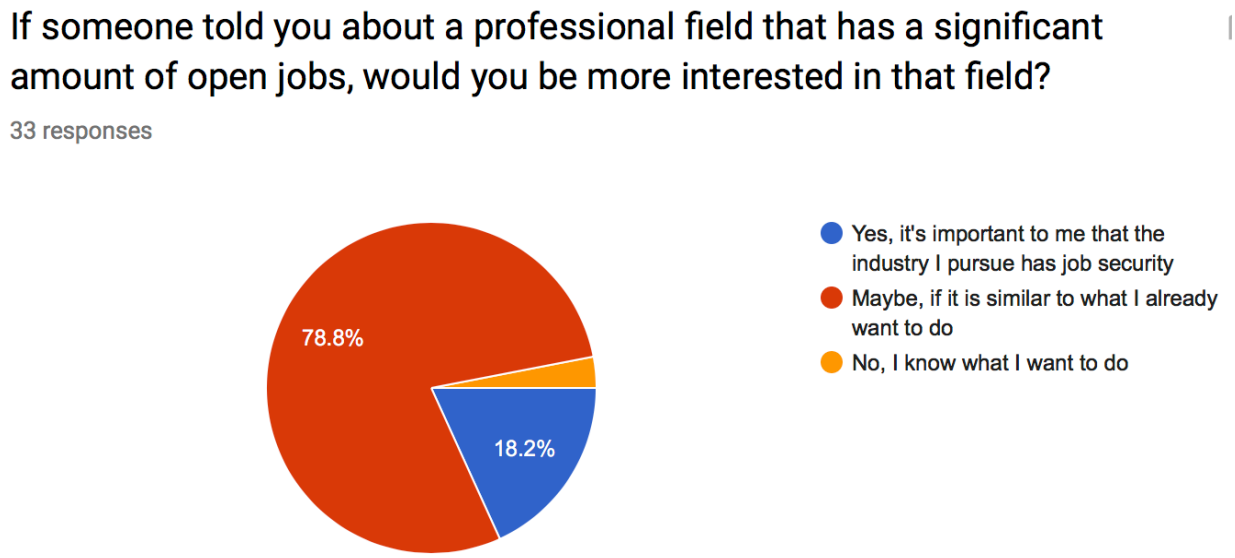

Figure 6: Survey response to "If someone told you about a professional field that has a significant amount of open jobs, would you be more interested in that field?"

CYBER INNOVATION CHALLENGE

Date: Friday, June 21 - Sunday, June 23
Location: California Cybersecurity Institute at Camp San Luis Obispo, CA

The CCIC is the high school cybersecurity championship for the State of California featuring 32 teams in 2 divisions and more than 200 total student participants. The CCIC is conducted through live-immersive environments representing real world scenarios. It is designed to raise up the next generation of cybersecurity professionals by increasing their cyber fluency, professional experience, and interest in digital forensics. This year's challenge will focus on both the ethical and technical issues of an attack on a medical facility and its personnel.

The CCIC begins with the spring 2019 regional qualifying rounds from which, along with an "at-large" selection process, 32 teams in two divisions will be drawn to participate in the state championship round, June 21-23 at the CCI. The first division is for m ore experienced clubs and the second is for teams newer to this type of exercise. This year's competition highlights the challenges of securing healthcare information and devices due to the growing importance of protecting the progress of medical technology against impending cyberthreats.

Who can participate?

The CCIC is open to all California high schools. Last year's event featured an immersive forensics training scenario in a hospital office environment and team of professionals from government, industry and education. Learn more about this year's event at youtu.be/2XIn4VzUXFI

For more information, contact us at
cci@calpoly.edu or 805-756-1368
Learn more at cci.calpoly.edu/events

CAL POLY
SAN LUIS OBISPO

Figure 7: CCIC Information Poster (created by CCI)

CAL POLY California Cybersecurity Institute

Participant Survey

How did you hear about this event?

- [ ] Through my school
- [ ] Through a parent/guardian
- [ ] Online
- [ ] Other

Did you have any experience with cybersecurity prior to this event?

- [ ] Yes
- [ ] No
- [ ] Prefer not to answer

After participating in this event, would you say that you are interested in studying cybersecurity in the future?

- [ ] Yes, I would say that I am interested in cybersecurity as a potential course of study
- [ ] No, I don't think cybersecurity is for me
- [ ] I was already interested in studying cybersecurity before participating in this event
- [ ] I'm not sure

This event utilized challenge based learning, would you say that you prefer this hands-on learning to textbook learning

- [ ] Yes
- [ ] No
- [ ] IBoth are equally effective

Figure 8: CCIC Exit Survey draft

In your own words, what is cybersecurity?

Would you participate in this event again?

- ☐ Yes
- ☐ No
- ☐ Maybe

Figure 9: CCIC Exit Survey draft page 2

Email Pitch Template (Local News)

Hi, [insert name].

I wanted to let you know that a high school in your area, namely [insert school name], has entered a team to compete in the 2019 California Cyber Innovation Challenge (CCIC) presented by California Cybersecurity Institute (CCI). Coming Friday, June 21, through Sunday, June 23, to CCI at Camp San Luis Obispo, CCIC is a high school cybersecurity championship for the state of California that hosts 32 teams of bright and talented high school students. The CCIC is conducted through live-immersive environments that represent real world cybersecurity scenarios. This event is designed to inspire the next generation of cybersecurity professionals by exposing students to professional experience, cyber fluency and digital forensics. This challenge-based learning model will allow the competing students to gain early and invaluable experience in a technical field with an increasing number of job opportunities. Given the increasing importance of cybersecurity matters and STEM education, I am sure you will agree that your local school's participation in this event will be of interest to your readers.

A full press kit for CCIC is linked here [link press kit from CCI website]. Please let me know if you'd like to speak to a CCI representative, would like more information or would like any high-resolution images.

Thank you!

[Name]
[Contact]

Figure 10: Email Pitch Template for Local News

Email Pitch Template for School Publications

Hi, [insert name].

My name is [insert name] and I am the [insert media position] at the California Cybersecurity Institute (CCI). It has come to my attention that students from your school have formed a team and will be participating in the 2019 California Cyber Innovation Challenge (CCIC) presented by CCI. This event allows students to compete in a cybersecurity championship for the state of California that hosts 32 teams of bright and talented high school students. While reading about your school, I encountered [insert school publication name], and was impressed with your school's student journalism. Because CCIC is an event that is hosting students from your school, I thought you would be interested in writing an article for [insert school publication name] about CCIC and your school's involvement in the event.

As additional background for your article, please note the CCIC, which occurs Friday, June 21, through Sunday, June 23, Camp San Luis Obispo, is conducted through live-immersive environments that represent real world scenarios. This event is designed to inspire the next generation of cybersecurity professionals by exposing students to professional experience, cyber fluency and digital forensics. This challenge-based learning model will allow the competing students to gain early and invaluable experience in a technical field with an increasing number of job opportunities.

At CCI, we strive to provide early professional experiences to high school students. For this reason, we would love for the student journalists at the participating high schools to have the opportunity to cover an event with real-world impact on your school.

All of the information that you need about CCIC can be found here [link press kit from CCI website]. If you have any questions for me, do not hesitate to reach out.

Thank you!

[Name]
[Contact]

Figure 11: Email Pitch Template for School Publications

Figure 12: Press Kit for CCIC

ABOUT US

CCI is multi-agency effort to protect California from future cyber threats through training and research for government, academia, military, law enforcement, first responders and private entities.
As an extension of Cal Poly's Cybersecurity Center, CCI aims to educate the next generation of cybersecurity leaders by providing a hands-on research and learning environment.
The program offers an environment for cyber defense innovation through advanced study and applied research on emerging issues and technical challenges.

CAL POLY
California Cybersecurity Institute

HISTORY

Partnered with the California National Guard and Cal Poly, San Luis Obispo, the CCI serves as an extended Learn by Doing space for Cal Poly students to explore new cyber technologies alongside industry professionals.

LOCATION

QUICK CYBERSECURITY FACTS

1,121% increase in cybersecurity incidents since 2006

35,000 open cybersecurity jobs in California

$450M in reported losses for California

CA #1 in victims of cybercrime, as ranked by FBI/IC3

OUR PROGRAM PROVIDES...

TRAINING

RESOURCES

INNOVATION

PROTECTION

EXPERTISE

California Cybersecurity Institute

Figure 12: Press Kit for CCIC

Fact Sheet

California Cyber Innovation Challenge

What: The 2019 California Cyber Innovation Challenge (CCIC)

Who: Hosted by California Cybersecurity Institute, the CCIC is open to all California high and middle schools. The event will feature 32 high school teams (over 200 student participants) competing in two divisions selected from the regional qualifying rounds and an "At-Large" application process. These 32 teams were chosen from the hundreds that applied.

When: Friday, June 21 - Sunday, June 23

Where: California Cybersecurity Institute at Camp San Luis Obispo, CA

Why: CCIC is designed to raise up the next generation of cybersecurity professionals by increasing their cyber fluency, professional experience and interest in digital forensics.

How: Learn more at cci.calpoly.edu/events

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California Cybersecurity Institute

Figure 12: Press Kit for CCIC

News Release

California Cybersecurity Institute hosts California Cyber Innovation Challenge

SAN LUIS OBISPO, Calif. -- Cal Poly's California Cybersecurity Institute (CCI) will host the California Cyber Innovation Challenge (CCIC), a statewide high school cybersecurity competition. The competition is open to all California high and middle schools on June 21 to 23 at Camp San Luis Obispo.

CCIC is designed to introduce the next generation to cybersecurity as a possible course of study and career path. The event will feature 32 teams in 2 divisions and more than 200 total student participants. The first division consists of more experienced clubs and the second division is for teams that are newer to this type of challenge.

"In addition to training students on cyber forensics, we will provide hands-on learning opportunities for the next generation of cyber defenders," said Cal Poly's CCI Director William J. "Bill" Britton.

The CCIC is conducted through live-immersive environments representing real world scenarios. This unique, challenge based learning event is great exposure to cybersecurity, a field with thousands of open jobs in California alone.

Throughout the spring, high school students from across California competed in regional cybersecurity competitions, where winners earned automatic entry to the statewide tournament at Cal Poly. Other competitors come from an "at-large" selection process that will draw teams from areas that do not currently have regional competitions.

This year's competition highlights the challenges of securing healthcare information and devices due to the growing importance of protecting the progress of medical technology against impending cyberthreats. Students will work collaboratively, analyze physical evidence and use state-of-the-art forensics tools to extract and collect digital evidence.

Many key leaders from the State of California and medical community will attend.

For more information on CCIC, contact James Baker at jbaker30@calpoly.edu or 805-756-2948

California Cybersecurity Institute

Figure 12: Press Kit for CCIC

Figure 12: Press Kit for CCIC

Photos

The 2018 California Cyber Innovation Challenge first place winners

The 2018 California Cyber Innovation Challenge participants

California Cybersecurity Institute

Figure 12: Press Kit for CCIC

Figure 13: Press Kit for Post CCIC

Figure 13: Press Kit for Post CCIC

Fact Sheet

California Cyber Innovation Challenge

What: The 2019 California Cyber Innovation Challenge (CCIC)

Who: Hosted by California Cybersecurity Institute, the CCIC featured 32 high school teams (over 200 student participants) that competed in two divisions selected from the regional qualifying rounds and an "At-Large" application process. These 32 teams were chosen from the hundreds that applied. [Insert winning team here]

When: Friday, June 21 - Sunday, June 23

Where: California Cybersecurity Institute at Camp San Luis Obispo, CA

Why: CCIC is designed to raise up the next generation of cybersecurity professionals by increasing their cyber fluency, professional experience and interest in digital forensics.

How: [insert details of how the winning team won the competition] Learn more at cci.calpoly.edu/events

###

California Cybersecurity Institute

Figure 13: Press Kit for Post CCIC

News Release

California Cybersecurity Institute hosts California Cyber Innovation Challenge

SAN LUIS OBISPO, Calif. -- Cal Poly's California Cybersecurity Institute (CCI) hosted the third annual California Cyber Innovation Challenge (CCIC), a statewide high school cybersecurity competition. The competition was open to all qualifying California high and middle schools on June 21 to 23 at Camp San Luis Obispo. This year, a team from [insert winning high school name] from [insert city] took home the big win.

CCIC is designed to introduce the next generation to cybersecurity as a possible course of study and career path. The event featured 32 teams in 2 divisions and more than 200 total student participants. The first division consists of more experienced clubs and the second division is for teams that are newer to this type of challenge.

[insert quote from participant]

The CCIC is conducted through live-immersive environments representing real world scenarios. [insert description of this year's challenge]

This unique, challenge based learning event is great exposure to cybersecurity, a field with thousands of open jobs in California alone.

[insert quote from CCI representative
]
Competing students worked collaboratively, analyzed physical evidence and used state-of-the-art forensics tools to extract and collect digital evidence.

Many key leaders from the State of California and medical community attended including [insert names].

For more information on CCIC, contact James Baker at jbaker30@calpoly.edu or 805-756-2948

California Cybersecurity Institute

Figure 13: Press Kit for Post CCIC

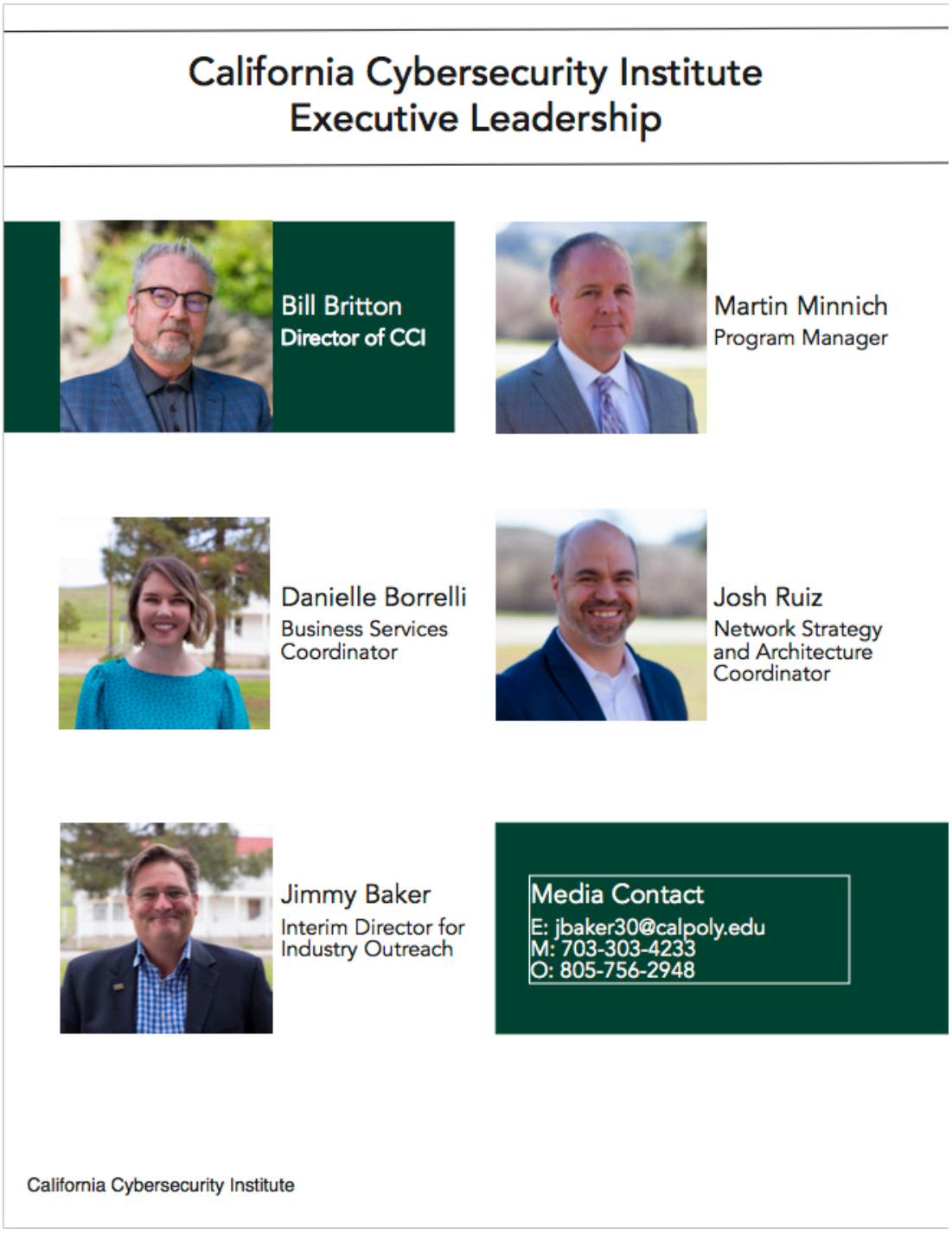


Figure 13: Press Kit for Post CCIC

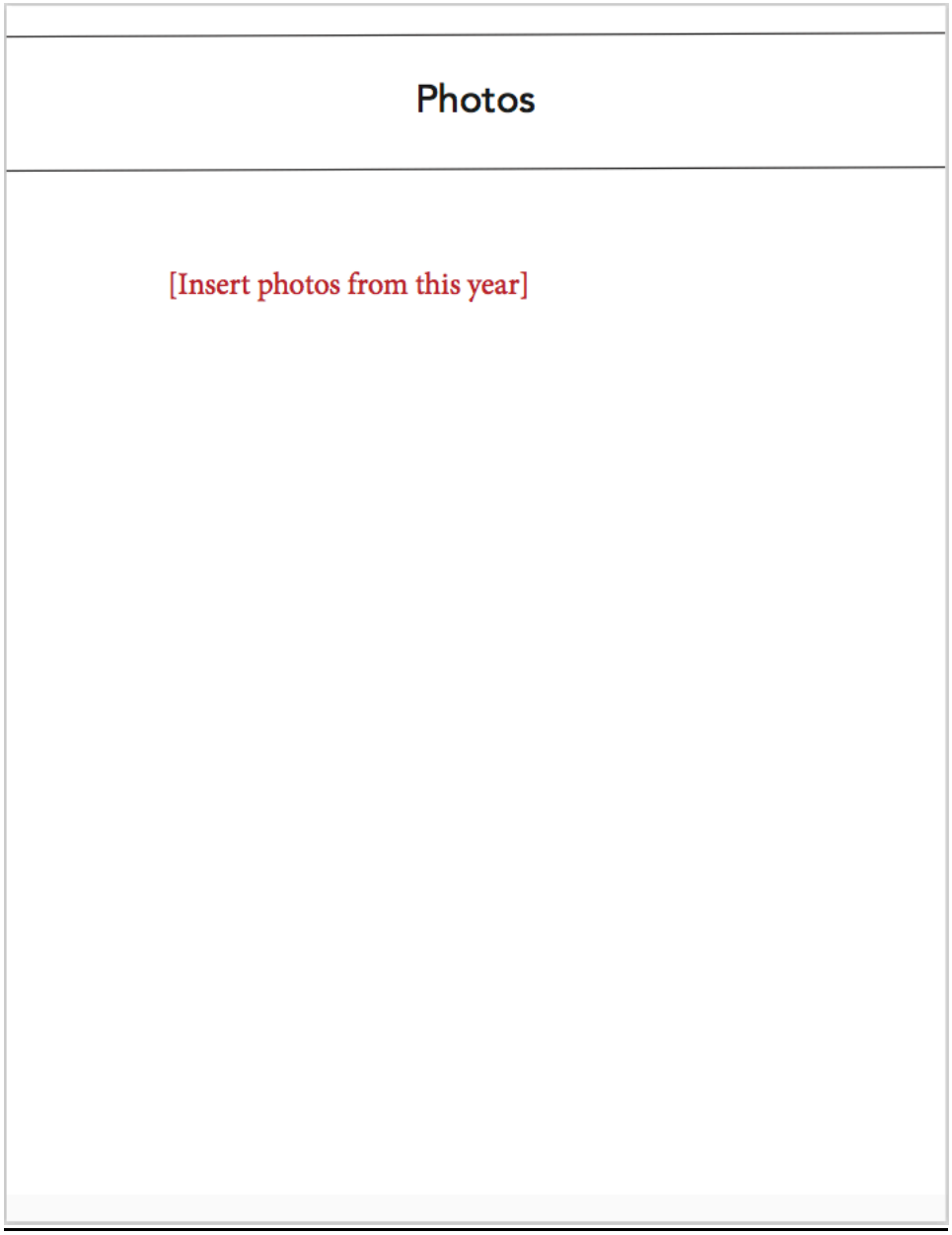


Figure 13: Press Kit for Post CCIC

Appendix B: Interview

Interview Transcript: Jimmy Baker

The following interview was conducted over email to gather information and direct quotes that could be used for the press kits.

Interviewer: Caroline Ster
Respondent: Interim Director for Industry Outreach @ California Cybersecurity Institute (Jimmy Baker)

Email sent by Caroline Ster:

Hello,

My name is Caroline Ster and I am the student working on press kits for CCIC for my senior project. I am currently working on a news release for the press kits, and I would like to include quotes from some/all of you. If you could answer the questions below that would be great. Thank you!

Why does CCI put on the California Cyber Innovation Challenge?

Who are the sponsors this year?

In what ways can students benefit from participating in an event like this?

What is one statistic about cybersecurity that shocks you?

Do you believe that participating in events like CCIC is something that students could benefit from listing on college applications? Why or why not?

If you were speaking to someone that has never heard of CCI, what is one thing that you would want them to know?

Best,

Caroline Ster

Response from Jimmy Baker:

Why does CCI put on the California Cyber Innovation Challenge?

For the third year in a row, Cal Poly is hosting the California Cyber Innovation Challenge (CCIC), June 21-23. The CCIC is the high school cybersecurity championship for the state of California. This year, hundreds of schools competed to participate in the championship — only 29 teams qualified.

The CCIC impacts students across all demographics and has quadrupled in size over the last four years. Cal Poly collaborates with organizations already focused on "California for All" such as the Sector Navigators, Mayor's Cup and the Governer's Office of Business and Economic Development (GO-Biz). There is no modern crime without a cyber component. With progressively sophisticated cyberattacks and e-crime on the rise, a unified effort is needed to protect our critical infrastructure, economy and citizens.

The CCIC is designed to raise up the next generation of cybersecurity professionals by increasing their cyber fluency; professional experience; cyber ethics; cyber citizenship or knowledge of their online rights, privileges and responsibilities; and interest in cyber careers. This unique event stimulates interest in becoming a cyber professional and informs students of multiple pathways to well-paying jobs through apprenticeships, community colleges and other state based universities.

The CCIC takes place in a live-immersive environment that represents real-world scenarios. Many of the cyber coaches and students commented that the immersive environment differentiates the CCIC from the traditional format of cyber, capture the flag and Cyber Patriot competitions. Another unique characteristic of the CCIC is student teams are required to present their findings to a panel of judges which helps them develop their communication skills.

Who are the sponsors this year?

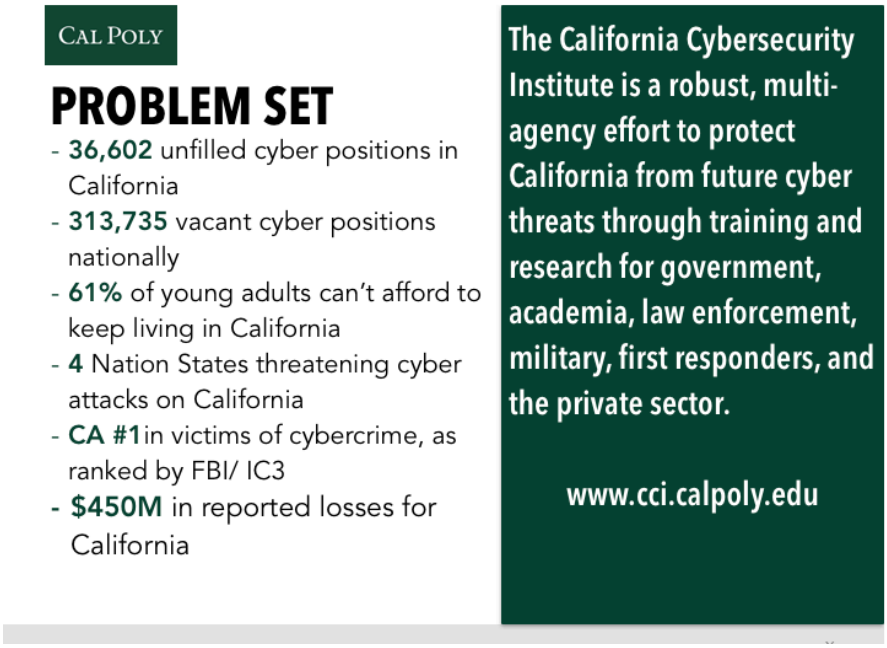
Our sponsors are from government and industry. We are still finalizing sponsors. My graphics

team is creating a logo with all the sponsors on it.

In what ways can students benefit from participating in an event like this?

The CCIC takes place in a live-immersive environment that represents real-world scenarios. Many of the cyber coaches and students commented that the immersive environment differentiates the CCIC from the traditional format of cyber, capture the flag and Cyber Patriot competitions. Another unique characteristic of the CCIC is student teams are required to present their findings to a panel of judges which helps them develop their communication skills.

What is one statistic about cybersecurity that shocks you?
See attached graphic of problem set facing California.



Do you believe that participating in events like CCIC is something that students could benefit from listing on college applications? Why or why not?
Yes, in order to qualify for this competition, students had to qualify and compete through the Mayor's cup challenge. The CCIC is the state championship for cybersecurity for the State of California.

If you were speaking to someone that has never heard of CCI, what is one thing that you would

want them to know?

The CCIC is a California-focused, statewide cybersecurity competition where 30 high school teams compete in two divisions. The CCIC is conducted through live-immersive environments representing real-world scenarios. It is designed to raise up the next generation of cybersecurity professionals by increasing their cyber fluency, professional experience, and interest in digital forensics. After the teams compete in the cyber competition, they will present their findings to a panel of judges from the technology marketplace, government, law enforcement, military, and academia.

"In addition to training students on cyber forensics, we will provide hands-on learning opportunities for the next generation of cyber defenders," said Cal Poly's California Cybersecurity Institute Director William J. "Bill" Britton.

Throughout the spring, teams of high school students from across California competed in regional Mayor Cup Challenges. Winners from the designated regional cybersecurity competitions earn automatic entry to the statewide tournament at Cal Poly. The other competitors come from an "at-large" selection process that will draw teams from areas that do not currently have regional competitions. The competition has quadrupled in size over the last four years.

The public is invited to observe the 2019

Appendix C: Tables

Positive	Negative
Positive, I want to keep my identity safe	negative because it's commonly associated with invasion of privacy
Positive because I have not been hacked	Negative, because there are so many cases we hear about breach in cybersecurity
Positive because it helps people	Negative, because I'm not as aware of the dangers online and what I need to do to protect myself. I honestly just don't like thinking about it.
Positive, sounds like to will protect money	Negative, government likes to spy
Positive because it prevents my computers from getting viruses	Negative. There are lots of sketchy stories about privacy violations.
Positive because it is security so it's helpful	Negative as it means identity theft
I have a positive connotation because I want my personal information kept safe.	Negative because of all the news about hacking
Generally positive. Protects consumers and workers alike.	Negative

Table 1: Survey responses

Timestamp	What year in	What causes	Have you alr	If someone t	Do you prefe	Are you (gen	In your own	Overall, do y	When browsing online, what kind of articles interest you?
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	No	No clue		
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	I'm not sure	safety on the	negative bc i	articles abt pop culture, current events
2019/05/01	10th grade	I participate	Yes	Yes, it's impo	textbook	I'm not sure	Online Prote	Positive, I wa	Athletic videos like training for a triathlon
2019/05/01	10th grade	I participate	No	Yes, it's impo	hands-on	Yes	Protection fr	Negative, be	Current events, things that pop up that I have browsed about before
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	Yes	Online prote	Positive beca	Celebrity news and food networks
2019/05/01	11th grade	I participate	No	Maybe, if it i	textbook	I'm not sure	The protecti	Negative, be	Sports articles, current opinion pieces, literature and movie reviews, and breaking news.
2019/05/01	10th grade	I participate	Maybe	Yes, it's impo	hands-on	I'm not sure	How secure	Positive beca	Political and ones about comfortable clothes
2019/05/01	10th grade	Both 1 & 2	Maybe	Maybe, if it i	hands-on	I'm not sure	Being safe or	Negative	Lifestyle/academic
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	textbook	Yes	The ability to	I feel like mo	Articles about current events such as the coup in Venezuela
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	No	I donâ€™t kn	Positive, sou	Pop culture and current events
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	Yes			Current events, environmental, human rights
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	Yes	Online privac	Positive	Gossip
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	Yes	Security that	Negative, go	War and power and money
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	textbook	No			
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	I'm not sure	Making sure	Negative. Th	About things that Iâ€™m interested in including tv shows and current news etc
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	No	Computer pr	Positive bc it	Celebrities, news stories, etc
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	No	not familiar	donâ€™t knc	fun, exciting, maybe fashion/beauty based
2019/05/01	11th grade	I participate	No	Maybe, if it i	textbook	No			
2019/05/01	10th grade	I participate	Maybe	Yes, it's impo	hands-on	No			
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	No	Not sure	Not sure	Trending, news that relates to me (ethnicity, age, etc)
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	No			
2019/05/01	10th grade	I participate	Maybe	Maybe, if it i	hands-on	Yes	Security onli	Positive beca	Current events
2019/05/01	10th grade	I participate	Yes	Maybe, if it i	hands-on	Yes	Personal sec	Negative as I	Health studies
2019/05/01	11th grade	I participate	No	Maybe, if it i	hands-on	No			Medical articles
2019/05/01	10th grade	I participate	Maybe	Yes, it's impo	hands-on	I'm not sure	Protection of	I have a posit	Articles about food and science
2019/05/01	10th grade	I participate	No	Maybe, if it i	hands-on	Yes	Software tha	I think itâ€™	Cool things like art and new stuff
2019/05/01	10th grade	I participate	No	Maybe, if it i	hands-on	No	Protecting or	Negative bec	Pop culture, music
2019/05/01	12th grade	If Emily will b	Maybe	No, I know w	hands-on	I'm not sure	Whatever sm	positive	News
2019/05/01	9th grade	I participate	Maybe	Maybe, if it i	hands-on	I'm not sure			
2019/05/01	10th grade	I participate	No	Maybe, if it i	hands-on	I'm not sure	Online privac	Mixed becau	Sports
2019/05/02	10th grade	I participate	No	Yes, it's impo	hands-on	Yes	Security pert	Generally po	Political, business, stocks
2019/05/02	11th grade	I participate	Maybe	Maybe, if it i	hands-on	No			
2019/05/02	10th grade	I participate	Maybe	Maybe, if it i	hands-on	No			

Table 2: Survey Responses (2)

List of Schools	team				
CORE BUTTE HIGH SCHOOL	HyperLynx2				
Ukiah High School	MAJORCats				
Outlet	Name	Email	Phone	Other	
Chico Enterprise-Record	Mike Wolcott, editor	mwolcott@chicoer.com	530-896-7793	https://www.chicoer.com/contact-us/	
Patch	Tips	tips@patch.com	N/A	https://patch.com/contact-us	
The Ukiah Daily Journal	K.C. Meadows, editor	udjkcm@ukiahdj.com	office: 707-468-3500	https://www.ukiahdailyjournal.com/contact-us/	
The Mendocino Voice	office	info@mendovoice.com	707-506-6397	https://www.mendovoice.com/about/	
Ukiah Kigh School Newsletter	office		707-472-5750	http://www.ukiahhigh.uusd.net/apps/news/	

Table 3: CCIC Media List for Far North (CA)

School	team				
Jesuit High School	R4808N				
Roseville High School	I am g/				
Outlet	Name	Email	Phone	Other	
The Sacramento Bee	Office	https://www.sacbee.com/custon	916-321-1000		
The Sacramento Observer	N/A	editor@sacobserver.com	916-452-4781	https://sacobserver.com/contact-us/	
Sacramento Magazine	office	N/A	916-426-1720	https://www.sacmag.com/contact-us/	<-- see full list of contacts
Sactown Magazine	office	editors@sactownmag.com	916-441-4747	http://www.sactownmag.com/Contact-Us/	
Jesuit High School Magazine	School		916-482-6060	https://www.jesuithighschool.org/contact-us	
Eye of the Tiger (RHS)	Student Newspaper	will have to contact through social media		https://eyeofthetigernews.com	

Table 4: CCIC Media List for Sacramento (CA)

School	team
California High School	CyberSharks
Granada High School	Purple Narwhals

Outlet	Name	Email	Phone	Other
The Mercury News	Newsroom	local@bayareanewsgroup.com	408-920-5000	
East Bay Times	Newsroom	local@bayareanewsgroup.com	925-935-2525	https://www.eastbaytimes.com/contact-us/
The Registry Bay Area	Contact	http://theregistrybayarea.com/email-us/		http://theregistrybayarea.com/contact/
The Pomegranate (GHS)	student newspaper	N/A	925-606-3200	http://www.granadahs.schoolloop.com/newspaper
San Francosco Chronicle	Nanette Asimov, higher ed reporter	nasimov@sfchronicle.com	N/a	https://www.sfchronicle.com/newsroom_contacts/?psid=7p8qS

Table 5: CCIC Media List for Bay Area (CA)

School	team
James C Enochs High School	DuBois
Turlock High School	Turlock NJROTC

Outlet	Name	Email	Phone	Other
The Modesto Bee	Contact form	N/A	N/A	https://www.modbee.com/customer-service/contact-us/
The Fresno Bee	Contact form	N/A	559-441-6111	https://www.fresnobee.com/customer-service/contact-us/
ABC 30	Action News	N/A	559-485-0930	https://abc30.com/contact/
Merced Sun-Star	Main Office	contact form	209-722-1511	https://www.mercedsunstar.com/customer-service/contact-us/#navlink=mi_footer
Your Central Valley	News desk	newsdesk@ksee.com	559-222-2411	https://www.yourcentralvalley.com/contact-us
The Clarion (THS student paper)	Miss Barr (advisor)	vbarr@turlock.k12.ca.us	209-667-2055	https://ths-turlockusd-ca.schoolloop.com/clarion

Table 6: CCIC Media List for Central Valley (CA)

School	team			
Coast Union High School	Coast1			
Granada Hills Charter High School	Granada1			
Assurance Learning Academy	DoubleSimplex			
Outlet	Name	Email	Phone	Other
KSBY 6	Newsroom	N/A	805-597-8400	https://ksby.com/contact-us
The Tribune	Newsroom	newsroom@thetribunenews.com	N/A	https://www.sanluisobispo.com/news/submit-news/
Cal Coast News	Tips	tips@calcoastnews.com	N/A	https://calcoastnews.com/tip-your-team/
New Times San Luis Obispo	Camillia Lanham	clanham@newtimesslo.com	N/A	https://www.newtimesslo.com/sanluisobispo/Contacts
Mustang News	Contact page	N/A	N/A	http://mustangnews.net/contact/
The Plaid Press (Granada Hills Charte	Melissa Spaulding (advisor)	plaidpressghc@gmail.com	818-360-2361	https://theplaidpress.com

Table 7: CCIC Media List for South Central Coast (CA)

School	team			
North Hollywood High School	Mendenhall			
Benjamin Franklin High School	Voyager			
Palos Verdes Peninsula High School	PantherTeam1			
Mira Costa High School	RAWSUGAR			
Outlet	Name	Email	Phone	Other
Los Angeles Daily News	Newsroom	dnmetro@dailynews.com	818-713-3636	https://www.dailynews.com/contact-us/
Los Angeles Magazine	General contact	lamagedit@lamag.com	N/A	https://www.lamag.com
Los Angeles Times	General contact	tips@latimes.com	N/A	https://www.latimes.com/about/la-contact-us-html
North Hollywood High School	School website	N/A	818-753-6200	https://www.nhhs.net/apps/contact/
The Pen	Palos Verdes Peninsula High School student nnewspaper	thepennews@gmail.com	N/A	http://www.pvphsnews.com/contact/
Mira Costa High School	School website	N/A	310-318-7337	https://www.miracostahigh.org/apps/contact/

Table 8: CCIC Media List for Los Angeles (CA)

School	team			
Troy High School	TroyTechSupport			
Troy High School	BletchleyPark			
Outlet	**Name**	**Email**	**Phone**	**Other**
Orange County Registrar	Newsroom	local@ocregistrar.com	714-796-7984	https://www.ocregister.com/contact-us/
Orange Coast Magazine	N/A	info@orangecoast.com	N/A	https://www.orangecoast.com
Orange County Weekly	Contact us page	N/A	N/A	https://ocweekly.com/contact-us/
Voice of OC	Norberto Santana, Jr.	nsantanna@voiceofoc.org	office #: 714-558-8642	https://voiceofoc.org/about/contact/
Troy Chariot	School Newspaper	cann be contacted through social media		https://troychariot.org/about/

Table 9: CCIC Media List for Orange County (CA)

School	team			
Grand Terrace High School	CyberBois			
Martin Luther King High School	MLKTeam1			
Outlet	**Name**	**Email**	**Phone**	**Other**
Inland Empire Magazine	Editorial Department	iemail@iemag.bz	951-682-0246	http://www.inlandempiremagazine.com/aboutus.html
The Press-Enterprise	Newsroom	news@pe.com	951-368-9460	https://www.pe.com/contact-us/
Martin Luther King High School Website	School	N/A	615-329-8400	https://schools.mnps.org/martin-luther-king-jr-academi
Inland Valley Daily Bulletin	Newsroom	inlandeditors@scng.com	909-386-3877	https://www.dailybulletin.com/contact-us/
Inland Empire Community News	Maryjoy Duncan	editor@iecn.com	N/A	http://iecn.com/contact-us/

Table 10: CCIC Media List for Inland Empire (CA)

School	team			
Del Norte High School	CyberAegis Hyperion			
Scripps Ranch High School	ByteSized Falcons			
Outlet	Name	Email	Phone	Other
San Diego Union Tribune	Newsroom	local@sduniontribune.com	619-293-1211	
San Diego Magazine	Erin Meanley Glenny	meanley@sdmag.com	619-230-9292	
Times of San Diego	Newsroom	N/A	(858)369-0366	
Del Norte Media	School website	N/A	N/A	http://delnortemedia.com/submission/
The Scripps Ranch High School Falcon	School paper			https://falconflyernewspaper.wordpress.com/contact/

Table 11: CCIC Media List for San Diego (CA)