INNOVATE

CAREER DEVELOPMENT PROJECT
PMDC

April 10, 2024

La Cueva High School
7801 Wilshire Ave NE,
Albuquerque, NM 87122
2023-2024

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I. EXECUTIVE SUMMARY

Why was Innovate created?

Business leaders and entrepreneurs are constantly enhancing their practices and procedures to change our society. The problem is there is a **large discontinuity between the technology sector and business sectors**. This can lead to a variety of issues for both respective fields such as increases in cyber attacks and cyber safety. The disconnects in these fields has led to a shortage of workers in the cybersecurity field and a **skilled labor shortage in technology-focused business positions**. We hoped that throughout the Innovate project we could provide training that would allow Innovate's students to have the technology and business skills to take on the future of business.

> "[Most] occupations will change, and more people will have to work with technology. **Highly skilled workers** working with **technology** will benefit" (McKinsey Global Institute)

What is Innovate?

Innovate is a project launched by two students dedicated to give other students unique lessons on topics and skills that are usually unattainable inside the classroom. When creating this project there was one goal in mind: **give students a unique educational opportunity that will foster a future in technology focused business careers**.

Who made Innovate?

Innovate was created by the careful and thought out ideas of many individuals. The Innovate team was composed of two project managers, curriculum developers from Sandia Labs, and an advisory team.

12
elementary school students

56
middle school students

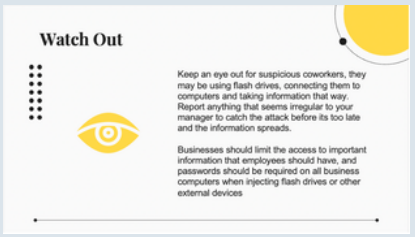
87
middle school students

155
students reached

87
middle school students

How was Innovate Executed?

Innovate was executed in a process that included **creating** the project, **communicating** with three schools, and presenting. During the creating phase Innovate's executive team gathered with technology and cybersecurity professionals to create a successful curriculum that would educate students on the topic, prepare them to face cybersecurity problems in the future, build confidence and speaking skills, and plant seeds for the future of technology positions in the business workforce. Following our state competition we knew that we wanted to expand the influence of Innovate. With these goals in mind we revised our curriculum and shared it to 5 schools and the New Mexico Girls Scouts (NMGS). Throughout the duration of the project we maintained the project goals of:



AWARENESS **EXPOSURE** **EDUCATION**

Innovate's Impact

Innovate was able to create a program that educated students to reach our project goals. Following our presentations, students quiz grades improved 60-70% from pretests. Additionally, in a free response question, **ALL 155 students** said they learned something during the Innovate presentation meaning we met our primary goal of education. We have also communicated with 5 schools and the NMGC to integrate our curriculum into their future teachings where the Innovate project goals will continue to inspire future business innovators.

3	6	155	9-18
schools	classes	students	ages

Monitoring Project quality

Quality

We based all of our information off of the GetScet and TracerFIRE programs lent to us by Sandia Labs. Our project presentation was also closely made with Sandia Labs manager Manoj Bhardwaj who oversaw the content and quality of our project.

Oversight

Throughout the creation process we had a review board that we showed all presentation materials to before presenting them which included a panel of AP Research, AP Seminar, and english teachers.

Reenforced

The quality of our presentation was reenforced when the elementary school club advisor, Mr. Lupinetti, told us that our presentation should return next year and expand to more grade levels. This confirmed our project was beneficial.

II. INITIATING

A. Statement of the problem

Business leaders and entrepreneurs are constantly enhancing their practices and procedures to change our society. McKinsey Global Institute for business and economics research found that "about **60 percent of all occupations** have at least **30 percent of activities that are technically automatable**, based on currently demonstrated technologies". This means that moving forward the ability for cyber threats has dramatically increased.

Additionally, businesses have shown a **significant need for increased cybersecurity education**. September 10th, 2023 a cyber attack hit MGM Resorts in Las Vegas causing "[everything to be] a mess" (Dawn Gilbertson, The Wall Street Journal). This brought to our attention the importance of cyber security and technology application in all types of business as attacks become frequent.

In the United States alone there are approximately **700,000** unfilled positions in the cybersecurity workforce.

There is also a lack of employees in the technological field. R&D executive, David Rotenberg, found that in the United States, **there are approximately 700,000 unfilled positions in the cybersecurity workforce alone**. Innovate provides an ability to gain confidence in one's tech abilities, which can be applied in an internship, job, or resume. This higher level of application and training allows Innovate's students to have more confidence and level of mastery before joining the business world.

The problem is there is a large **discontinuity between the technology sector and business sectors**. This can lead to a variety of issues for both respective fields such as increases in cyber attacks and cyber safety. The disconnects in these fields has led to a shortage of workers in the cybersecurity field and a **skilled labor shortage** in technology-focused business positions.

B. Project Scope

Purpose

The Innovate Project was created to bridge the divide between technological education and business operations. **Our hope is that technology and cybersecurity can be more effectively combined to create the highest functioning level of community businesses**. In addition, our goal is to spread technology and cybersecurity awareness, education, and exposure to a younger audience that can bring their new acquisitions to new careers.

AWARENESS | EXPOSURE | EDUCATION

Rationale

We originally decided to select a **high school age group** because this opportunity could potentially align our students with job positions or internships in the cybersecurity field but then expanded down to **elementary** and **middle school levels**. To create the Innovate project we partnered with Sandia National Laboratories and their program, TracerFIRE to start formulating our cybersecurity training. With the help of Sandia's team, we created a program where students were given a mentorship segment with cyber/ technology training, presenting, speaking, and customer service training. During the second segment, we aligned the students with future career options in cybersecurity as well as clubs and classes they could take in middle and high school. We also wanted to pave the way for Innovators in the future and ensure that the benefits of our project could remain helping students. With the support of other educators, we formulated ways that the Innovate curriculum could continue its impact. We donated our curriculum and training to the New Mexico Girl Scouts so that they could use it when the scouts are earning their cybersecurity badge, and donated our curriculum to several Albuquerque schools to continue using.

Expected benefits

Our goal for this project was to teach students how to fight cyber threats, work as a team, practice internet safety, and utilize customer service and speaking skills. We expect our students to take the knowledge and skills learned in this session to make greater changes in the worlds of business and technology in their futures.

III. PLANNING AND ORGANIZING

A. Project Goals

In creating Innovate, our primary goals were to spread awareness of cyber tech importance and cybersecurity careers, expose students to cyber training, and educate students on how to keep themselves safe, be technologically literate, and the amount and types of cybersecurity/ technology jobs available within the business field.

AWARENESS

Businesses and individuals are not fully **aware** of the importance of cybersecurity, they are more susceptible to the threats it creates. Innovate's goal is to **bring attention** to the importance of cybersecurity, careers,and measures businesses can take to protect themselves.

EXPOSURE

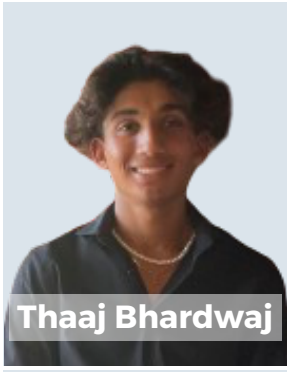
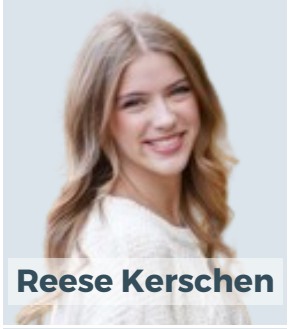
By **exposing** our students to cybersecurity training they are able to **better protect themselves** from potential threats. Our goal is to **prepare** students to identify threats and initiate preventative measures to ensure ample business operations.

EDUCATION

By **educating** students, we wanted to bring together professional sectors that do not commonly combine. Innovate's goal is to share **more knowledge** about cybersecurity to help business employees **prevent attacks** and to **share technology careers** that exist in business

B. Human Resource Management Plan

Primary members

Member	Role	Responsibilities	Skills & Strengths
 Thaaj Bhardwaj	Project Manager (Execution & Partnership)	Thaaj was responsible for curating the partnership with Sandia National Labs and overseeing plans. Thaaj also presented the media created to the classes.	Thaaj utilized his business & technology skills, research experience, and presenting skills throughout the Innovate to best help the project succeed.
 Reese Kerschen	Project Manager (Design & Outreach)	Reese was responsible for building the project model and managing project plans. She contacted the target schools and created the media for the project.	Reese utilized her strong business and technology skills, research experience, and speaking skills which were all helpful throughout the project.
 Manoj Bhardwaj	Curriculum Advisor (Sandia's Team)	Manoj helped the project by connecting the project managers to resources, provided information that was presented in the media to our students.	Manoj has extensive experience in the field of cybersecurity as well as having taught this subject allowing his skills to be effectively utilized.

Assisting Members	Skye Denton	Advisory Board	As a four year DECA member Skye gave significant insight into what a project should look like and how a project should be edited. She was key in editing the project.
	Arnav Chhabra	Advisory Board	Arnav has exceptional skills in the areas of graphic design and project composure. This was very helpful in creating visual aspects of our project as we used his expertise.
	Tyler Morris	Cybertech Advisor	Mr. Morris is a part of the Sandia TracerFIRE and SCET team. He allowed us to use their cybersecurity education software to base our final curriculum from and had extensive cybersecurity and technology skills.
Connections	Richard Faulkner	Advisor	Mr. Faulkner acted as an advisor throughout the project. He kept us aligned with DECA standards and encouraged us to present to all of fundamentals of marketing classes when he learned about Innovate
	Trisha Adams	NMGS Delegate	Ms. Adams displayed interest in our curriculum after hearing about the content of Innovate. Innovate will now be integrated into the process of receiving the cybersecurity basics and cybersecurity safeguards badges at all levels.

C. Schedule

1st Milestone

Partnership

The first milestone in completing our project was successfully partnering with Sandia National Laboratories cyber-training program. Finding and working with them was a key element to developing the Innovate project. To complete this milestone we contacted Tyler Morris via email before having our first zoom meeting where we confirmed their ability to work with us on our project.

2nd Milestone

Confirmation + Creation

After meeting with Mr. Morris we needed to confirm that the Get SCET software would align with the goals and components of the project. We also needed to confirm that the software was at a realistic level of difficulty for our target audience. We found this existing program wouldn't be compatible and created our own curriculum based off of Get SCET information. Manoj Bhardwaj used his expertise to assist us in creating the new presentations for each school level.

3rd Milestone

Communication

Once the content of the project had been created, we had to find students to share our project with. We connected with the majority of our students by presenting to classes and clubs within elementary, middle, and high school levels. To reach these student we contacted the schools head of program and principal. We coordinated with to North Star elementary, Double Eagle Elementary (did not present to), Desert Ridge Middle School, and La Cueva High School to present to their students.

Project Event

4th Milestone

Our forth milestone was finalizing and hosting presentations. On December 12th we presented to North Star Elementary School, December 13th at Desert Ridge Middle School, and January 23rd and 24th at La Cueva high school. Reaching this milestone meant that Innovate had reached its target audience and started to impact the lives of New Mexican students.

5th Milestone

Future Contributions

Our last milestone was reached after our state competition in March. Based on the overwhelming positive responses that we were receiving after our project was presented to both the students and to judges we decided that expanding and continuing our project in the future was necessary. We were able to get in contact with the New Mexico Girl Scouts who expressed interest in the curriculum we had created because of how closely it aligned with the current training for their cybersecurity badges. The girl scouts had three different possible badges, cybersecurity basics, safeguards, and investigator. These three badges are also taught to six different age groups. We decided to share access to the curriculum we created to further involve and educate the 6,000 girl scouts of New Mexico. We also donated our curriculum to technology teachers and club advisors from North Star Elementary School, Double Eagle Elementary School, Desert Ridge Middle School, Eisenhower Middle School, and La Cueva High School upon request.

Timeline

August - September, 2023
The Innovate idea was created and we reached out to possible partners.

October 1st, 2023
The partnership with Sandia Labs was made official during a zoom meeting.

Milestone 1 reached

October 7th, 2023
Get SCET was tested to work for the target audience.

October 12-30th, 2023
Get SCET didn't align with our ideas so a new curriculum was necessary

October 30 - November 5
With help from our advisors New curriculum was created

Milestone 2 reached

November 5-10th 2023
We communicated with advisors to create a schedule of presentations

Milestone 3 reached

November 10th 2023
Innovate Training Event (for High School) was canceled due to snow day

December 12th 2023
First media presentation and interaction was given at North Star Elementary

December 13th 2023
Second media presenatation was given at Desert Ridge Middle School

January 22nd 2024
Last presentation was given to three La Cueva High School Classes

January 2024
Presentations were complete and impressions could be measured.

Milestone 4 reached

March 19th 2024
Innovate's curriculum was donated to the New Mexico Girl Scouts

March-April 2023
Innovate's curriculum was donated to 5 schools to educate K-12 students

Milestone 5 reached

D. Quality Management Plan

When creating the Innovate project we knew that to uphold the quality of our project we needed to do four primary things; **measure education** levels, reach **multiple age groups**, provide an **engaging education,** and **generate interest** within our students. All of these standards being met would ensure the caliber of our project.

1. Student Education

While planning our project we wanted a way that we could measure the education of the students who interacted in our presentation. We created a survey to give before and after giving our presentation to measure retention and learning.

2. Multiple Ages

Having a diverse age range in our project was important to us because the inspiration from the project came from a 4th and 5th grade club. Considering this, we also wanted to include older age groups who are able to start making career decisions.

3. Engaging Education

Creating a presentation that was engaging and interesting was essential to innovate because we wanted the presentation to be memorable and unlike that of a textbook or typical lecture. This meant creating an engaging presentation was necessary.

4. Generate Interest

To plant seeds within students that would lead to their future interest in cybersecurity (and other technology centered business) careers and or college majors, we knew we needed to generate continued interest within students.

E. Risk management Plan

Issues	Lack of Participation	Interest	Usage
Potential Impact	Without interest in our project we would loose out on both participation and impact because that could mean students weren't paying attention during our project or don't care to continue its teachings afterward.	Without students to participate in our project, Innovate could not make a difference in cultivating student interest in technology focused business careers.	We had concerns that the students could not or would not use the information they learned outside of the project in the future which would diminish the core purpose of the Innovate project.
Response Strategy	If students weren't willing to sign up for a program like this by themselves we decided the more effective way to get students to participate would be going directly to their classes and clubs. This was made possible by going directly to principles and teachers.	To keep students engagement and interest during the project we used class participation every two slides, gave candy as incentives to participate, and simplified the curriculum to an easily-digestible level.	To make sure that the information the students learned was usable we incorporated their future applications. For the younger students that included adding information about future clubs and giving a presentation on majors, and careers to older kids.

F. Proposed Project Budget

Within our project we wanted to show the powers of both technology and business skills so we **proposed a project budget of $0.** This was to show students the success they could have with only skills they acquire. Since our project was digital, we did not need to purchase anything to make sure our project was seen by others. As for the TracerFIRE and GetSCET software that played a pivotal part in the creation of our own curriculum, the usage was granted to us free of charge by Sandia Labs. This meant that we did not need to spend any money on the education software we used or on any of our own education.

Sandia National Laboratories

IV. EXECUTION

Plan Implementation

Following the establishment of an executive team and preparation during the planning phase, our execution phase began. With our goals of spreading awareness, exposure, and education in mind we created our curriculum with help from Manoj Bhardwaj. After our curriculum was created it was time to start executing the project.

1. Establishing Outreach

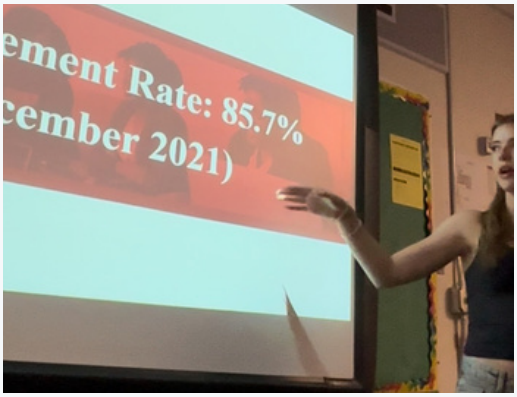
1.1 Elementary School - North Star

We knew that the most effective way to ensure student involvement would be to go directly into the classrooms and clubs of our target age groups. We got in contact with three different elementary schools; North Star, Double Eagle, and Dennis Chavez. As alumni of a North Star technology club, they became the easiest of the elementary schools to work with. We also decided that the most effective ways to reach elementary school students would be through a club because it would allow us to target older elementary school students (young elementary schoolers still have limited access to technology) and pursue kids who already had an interest in the field. This is how we ultimately chose to present to our first age level of students on **December 12th.**

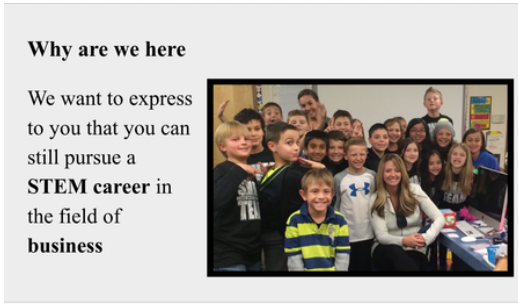
1.2 Middle School - Desert Ridge

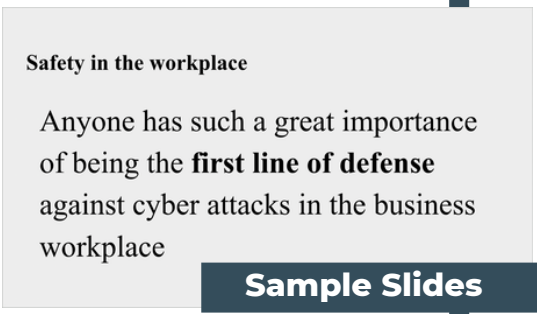
In the middle school age groups, presenting to a specific grade was less specific because we felt all of the grade levels would be good candidates. Instead, we just decided to see what group of students would be the most available to present to. After emailing Principal Salcaduo to gain approval to visit the school she aligned us with the technology teachers, Ms. Leachman, and Ms. Denardis. We found a day that we could present to multiple classes from each teacher. The technology classes only consisted of 6th grade students so we thought we did not need to change the presentation from the ones we gave to the 4th and 5th grade students. That meant we were ready to present on our second media day, **December 13th.**

1.3 High School - La Cueva



The lastly we presented to the high school age group. We had initially planned to present to them first on voluntary bias, but due to lack of excessive participation and a snow storm that night we canceled the event. That did entail us having to contact all the students who planned on attending on short notice to notify them the event would not be happening. After that setback we had to find a new time to present to the high school age group. We ended up coordinating with business class advisor, Richard Faulkner, to present to his Fundamentals of Marketing students.





Sample Slides

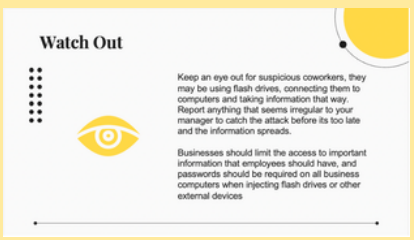
We knew that the average high school student has considerable more cybersecurity and technology knowledge than the average middle or elementary school student. This meant that during the class presentation we did not have to educate the students on what the topic but instead, how to be involved and future applications. We opted to present a completely **future-focused presentation** where the high school students were educated on majors, careers, internships, clubs, advisors, classes, and other ways that they could start incorporating STEM based business into their futures NOW.

2. Presenting the Project

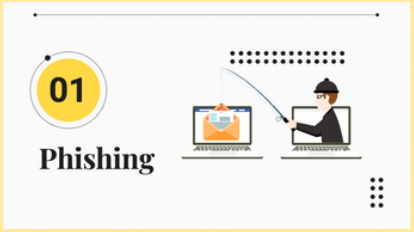
2.1 Elementary School - North Star

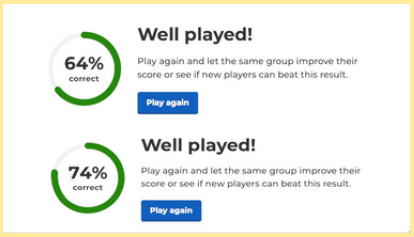
On **December 12th** 2023 the Innovate project was presented to a technology club at North Start Elementary School. This club consisted only of 4th and 5th grade students and met after school. We gave our presentation which consisted of frequent class discussion, for 15 minutes. After our presentation was done we launched the second segment of our presentation which was the survey element. The presentation took 10 minutes to explain and present leaving time for the students to ask questions and elaborate on their thoughts between questions. After the quiz was completed and the results were posted we rewarded the winner (with three, two, and one piece of candy accordingly) we asked the students for any final questions before leaving.

2.2 Middle School - Desert Ridge



On **December 13th** 2023 the Innovate project was presented to two middle school teacher's classes, Ms. Leachman and Ms. Denardis. The first class contained 28 students and the second class contained 32 students all of 6th grade students. The technology class allowed us to target students with a prior interest in technology which we could maximize by educating them on business.





We did research into Desert Ridge to learn about preexisting business and technology clubs that they could **continue participation** in. We also gave them information about how to join clubs and classes like DECA, robotics, and computer science in High School. Following our presentation to the classes we also conducted a quiz that the students took and asked questions following. We endorsed questions asked by the students at any point in the presentation, discussion, and quiz because along with showing engagement, it meant we were helping students become better educated on our project. This discussion period took about 30 minutes as the students we presented to had dozens of questions to ask us. After finishing our presentation and quiz we had been in the classroom for 45+ minutes and wrapped up the middle school level media day.

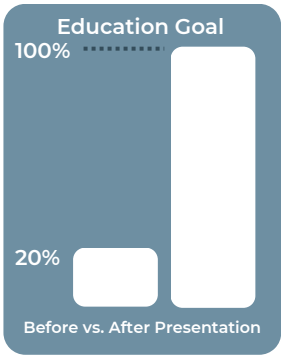
2.3 High School - La Cueva

On **December 22nd, 2023,** we presented the Innovate project to the high school age group. We presented to three of La Cueva's fundamentals of marketing classes. The students in these classes ranged from ages freshman - senior because they are elective classes which is significant because like the technology club we presented to, the students in these **classes had prior interest.** We gave a brief, 10 minute presentation with significant focus on the future of the cybersecurity, and technology-business field and what that could mean for them. As stated above, we decided not to provide the same quiz before and after the presentation that we did for the middle and elementary school children because we thought the content of the quiz was general knowledge for them. Instead, we asked them before and after the presentation what they considered to be options for them after high-school. Following our presentation 2/3 of students said that they would want to pursue a stem-business future that utilizes both sets of skills.

3. Reflection

3.1-3 All school levels

After all of the presentations were complete we were able to look back on our data. Along with increasing quiz grades of 60-70% improvement, in a free response question, **ALL students** said they learned something during the Innovate presentation meaning we **met our primary goal of education.**



4. The Future of Innovate

Following our state competition we knew we wanted to expand out project after the continuous support we were receiving and the requests for Innovate to continue. North Star Elementary requested we come back every year, Desert Ridge Middle requested we work with different types of classes at the school, and La Cueva also has plans of keeping this program going. Before this curriculum was sent, it was reevaluated by the members from the admin of the 5 schools that will be receiving the curriculum, our DECA Advisor, and a panel of AP Capstone teachers. We also began working with the New Mexico Girl Scouts to continue educating **female students K-12** on cybersecurity, technology, and business. This became very special to us and to Innovate because **only 25% of computer science jobs are represented by women (Pew Research Center).** We met separately with educators and admin from each program to discuss how the project will be implemented in the years to come. We know that through this continued practice we are not only giving students a comprehensive education on how to keep themselves and others safe, but inspiring the future leaders and **Innovators** of tomorrow.

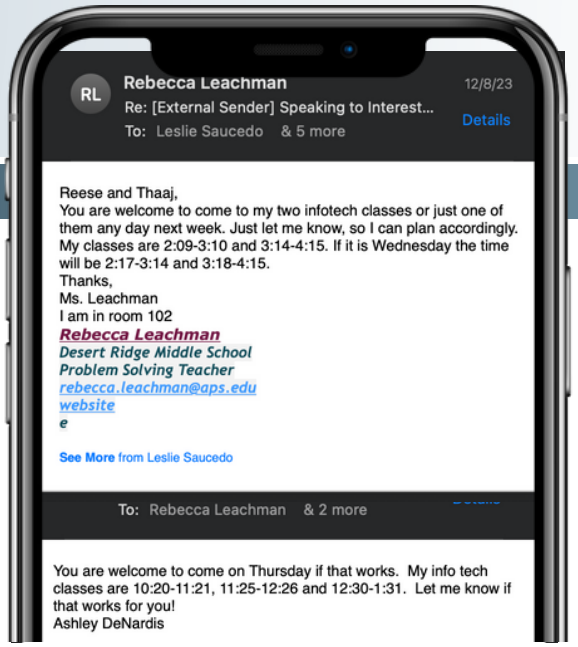
Program	Elementary School		Middle School		High School	
	North Star	Double Eagle	Desert Ridge	Eisenhower	La Cueva	NM Girl Scouts
Plan	North Star's technology club will use our curriculum annually	Computer classes will teach curriculum before using computers	Technology and CAD classes are integrating the curriculum	Technology teachers will integrate the curriculum into lesson plans	Business classes will use our future application presentation to show careers	The NMGC will use our curriculum on girls K-12 for their cybersecurity Basics and Safeguard badges

V. MONITORING AND CONTROLLING

A. Monitoring

Schedule - Communication

To ensure ample student involvement we **sent emails to club sponsors and teachers** that taught classes with students of our target market. This gave us an **accurate idea of how many students would be involved** because we came to their club meetings and classes.



This was important to keeping the project on schedule because an inadequate amount of participants may have led to a delay in the project execution. All communication was done through personal email to keep things organized.

Schedule - Event Planning

During our project we knew that to maximize the amount of kids we wanted to reach that meticulously planning our schedule was key. We decided to use google calendar shared between to two of us to keep our own personal commitments and Innovate commitments organized. This allowed us to present to multiple different classes multiple times a week.

Budgeting

We initially wanted to cater pizza and snacks to give an incentive for participants during our high school presentations, however, because we wanted to present on a C-day schedule when all of the high school classes were in one day, this meant the length of the classes was shorter and a more concise presentation was needed. This meant having a full meal as an incentive did not make as much sense because a long period of focus wasn't necessary. The lengths in which we were allotted to present to the elementary and middle school levels also was short so we decided against needed to buy food for the students. Instead, using small candies was sufficient and we could remain on our projected project budget of $0.

Project quality

Quality

During the entirety of our project we wanted to uphold the highest project quality. This meant we needed to present good quality information in a professional and clean way. We based all of our information off of the GetScet and TracerFIRE programs lent to us by Sandia Labs. Our project presentation was also closely made with Sandia Labs manager Manoj Bhardwaj who oversaw the content and quality of our project.

Oversight

Throughout the creation process we had a review board that we showed all presentation materials to before presenting them which included a panel of AP Research, AP Seminar, and english teachers.

Reinforced

The quality of our presentation was reenforced when the school and club advisors told us that our presentation should return next year and expand to more grade levels. This encouraged us to further our reach to additional school groups and confirm our project was beneficial.

B. Controlling

Problem

One of the biggest problems we faced was having to determine that the TracerFire Application wasn't appropirate for our project. This meant that we both would have to put in a lot more time and effort into making this topic understandable for our students.

Response Plan

After being connected with the right resources we were able to make our own course that was easier for the students to understand and easier for us to teach and use.

Problem

We had a lack of participants in our first workshop and had to cancel the event (there was also a snowstorm that would prohibit guaranteed safety of participants).

Response Plan

We solved this contacting groups of students who had already shown an interest in the Innovate topics (business or technology). We assessed this implied interest by contacting clubs (the elementary school technology club and high school business organization) because a student needed interest to join the club.

Problem

We were worried that our curriculum still contained topics that were too advanced of a topic for our elementary and middle school students.

Response Plan

We took care of that concern by making the presentation simple and having group conversation where kids would develop their own definitions for our terms. We would also tie in real world examples to bring this somewhat abstract concept to a physical form the students had seen before.

Problem

We additionally struggled to find places to present our presentation. Our slideshow was digital and would need a physical place like a classroom to present and many teachers had pre-planned lessons.

Response Plan

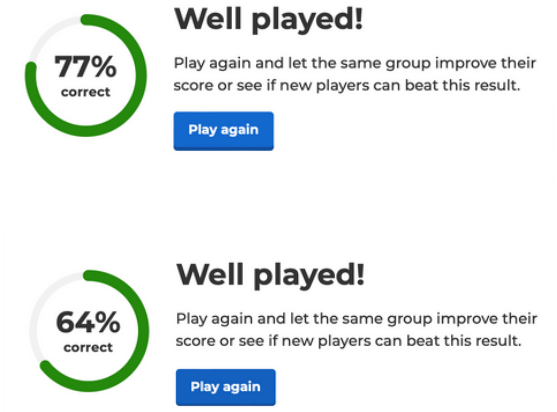
We communicated with teachers to find dates months in advance to minimize constraints.

VI. CLOSING THE PROJECT

A. Evaluation of key metrics

Student Survey

Following the Innovate participants' cyber security education program we had them take a comprehension survey to measure effectiveness. This was vital to the success of the project because it allowed the project coordinators to confirm that the students had (1) learned from presentation and were (2) prepared to utilize the information they learned in the real world. To measure its effectiveness we asked the students the same questions before and after the presentation to measure the content absorbed.



When asked the questions **the first time**, students were unable to answer completely or with **very low accuracy**. **Their final results being 77% and 64%** meant that the students **increased their performance from about 60-70%.** However, we decided not to use the Kahoot quiz for the high school age group because we thought a significant amount of the data and information we presented to the Middle and Elementary schoolers would have been more general knowledge to them. Instead, we asked the high schoolers about if they had plans after college before our presentation and if they would consider a career or major in STEM focused business after. The response was that most of them would consider a career in STEM focused business.

Elementary/Middle School Students

16% before — **71%** after

High School Students

3% before — **82%** after

Range of Influence

Throughout the Innovate project we knew that we wanted to expand our range of influence to reach a variety of ages. This is why we chose to present to the

elementary, middle, and high school age groups. We presented to a technology club of elementary schoolers that were in 4th and 5th grade, middle school students that were in 6th grade, and high school students that were in 9th-12th grade. This meant that within our presentation we brought ideas of combining **STEM and business to students ages 5-18** with the average student being 10-14. In donating our curriculum to be used by The New Mexico Girl Scouts we are also opening up our program to **6,000 young women** who can challenge the discrepancies in computer science, cybersecurity, and business.

Engaging Education 

The Innovate project consisted of a variety of students with different amounts of previous knowledge, interest levels, and age. We wanted to make sure that our lessons were informative, engaging, and digestible for all consumers of our presentation. For our elementary schoolers, this meant brining complex topics down to a simple level. During our presentations to the elementary and middle school students we included class participation every two slides, we reinforced participation with candy incentives, and used elaboration and examples to explain topics.

Generate Interest 

We needed to keep generated interest in our project that would help create future careers and college majors among all the students who were apart of Innovate. Measuring this interest was completely subjective and consisted of a free response questionnaire that was given to all three of the high school classes following our presentation. Before giving the presentation we asked the students what their intended plans after high school were to evaluate if any students previously had plans to major or find a career in stem-based business. Following the presentation the free response questionnaire showed a 79% increase in interest among the students with score changing from 3% before to 82% after.

B. Lessons learned

1. During the initiating process, **planning out your project** as **early** as possible is the most beneficial. The earlier planning is done, the more efficiently events can be made, connections can be set, and any unnecessary stress can be avoided.

2 When **planning and organizing** **partnering** with pre-existing people, groups, or organizations can be one of the most efficient ways to plan and promote a project. Possible partners could potentially bring additional promotion as well as give you a backbone like partnering with Sandia Labs did for us. Ultimately if we were to continue this project, bringing on other organizations would be crucial to furthering the success of this project. Additionally, when planning and organizing **communication** between our executive team and partners was a priority and could have been improved during the Innovate project. With additional communication during the planning process, more students, schools, and classes could have been reached.

3 When **executing** our project being **consistent** was something we did not inherently consider. When giving multiple presentations it was important to us that we have the same quality of education and presentation to each class which could have been easier if we had considered ways to keep our presentations consistent before presenting.

4 When **monitoring and controlling** the project, we learned how important **risk management and planning** was to successfully execute the given project. While we did do extensive planning prior to the execution of our project considering additional circumstances or **consulting** an advisor on their suspected risks could have been improved during our project to allow things to run more smoothly.

C. Recommendations for future projects

If someone were to make a project similar to ours we would recommend that you **take plenty of time** to establish the group of participants your project should address. We learned that some topics are more **tailored** to certain age groups and and **taking time to consider the target audience** is important. We were also initially worried we wouldn't have enough participants to present to which could have been mitigated by earlier planning and better communication.

On top of that with the requests to expand our project, a **multi-day workshop** where the skills and topics taught each day were further fostered would truly benefit this type of project. Initially, the Innovate presentation wanted to launch minor forms of attacks on the students. While this will be integrated to the 5 schools implementing Innovate curriculum and the NMGS we would have liked to implement that this year as well.

A lack of **communication** with the students before the presentation to establish a medium to launch an attack by surprise to truly see if the students can apply what they learned meant that this addition had to be removed. **Additional planning earlier** in the school year that would have allowed teachers to dedicate multiple days of teaching to our project would have allowed for additions like the one above.

Another recommendation would be to have an opportunity to **connect with local businesses** to give the students the chance to further showcase what they learned. **Earlier planning and additional communication** would make this possible and expand possible projects. Finally, take the time to **make the experience memorable** for the students because the happy memories associated with the topic you teach them about will help them develop more a passion and interest in the topic and thus the career.

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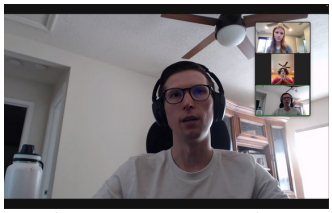
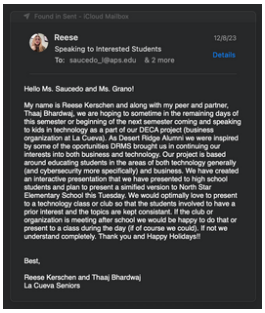
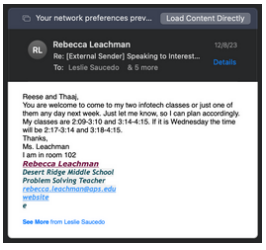
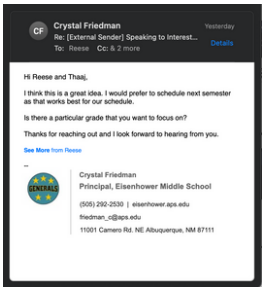
VIII. Appendix

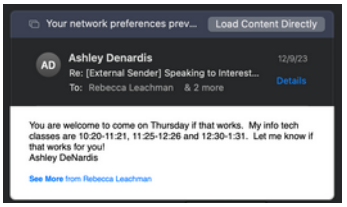


First Zoom meeting with potential mentor, Tyler Morris









Emails sent to schools to allow us to present to students