A Virtual Resource for Developing Online Learning Content

Photo Courtesy of: Fundesteam, 2018

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Creating a User-Friendly Virtual Platform for Teachers Adapting to Online Learning

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Abstract

In partnership with Fundesteam, a Panama non-profit organization, our project built a virtual, web-based resource for educators creating online learning content, and to encourage more virtual STEAM education for Panamanian children. Operating remotely from Worcester, Massachusetts our team investigated virtual learning techniques and the creation of online content by interviewing secondary school teachers, compiling recommended services, educators' opinions on online learning, and current issues/challenges (e.g., the struggle to virtually engage students). These interviews informed tutorials and recommendations the team developed for creating online content and adapting to virtual learning. The project designed a website to distribute these tutorials for online educators in Panama.

Executive Summary

After the construction of the Panama Canal, Panama's economy blossomed through shipping endeavors and a booming trade industry. However, insufficient educational opportunities have created a shortage of STEAM educated adults which threatens Panama's economy (Hausmann, Espinoza, Santos, 2017). The educational system in Panama is regarded as "one of the worst in the world" and has resisted reform for over thirty years (Scholaro, 2018). Education quality is significantly lower in rural areas, with dropout rates of 6.8 % in 2012 doubling to 14 % in 2013 (Knoema, 2013). Most primary and early secondary school education in Panama focuses on humanities, while later secondary school education splits between vocational and STEAM (Science, Technology, Engineering, Art, Math) academic pathways later in life.

The organization PanamaSTEM began in 2014 seeking to bridge the gap between Panama's STEAM education and the world's STEAM education (Fundesteam, 2020). PanamaSTEM began by implementing LEGO Education Robotics Programs. PanamaSTEM further expanded their robotics program by working in conjunction with Fundesteam, a non-profit organization committed to the development of STEAM education in Panama (PanamaSTEM, 2020). Both organizations work to improve the STEAM learning resources available to children of lower income families and cultivate their skills. To this end, Fundesteam is developing a website to guide teachers through the process of virtual learning. This website contains resources and tutorials for creating online learning content, including equipment, software, techniques, and advice. Our project involves the production of these resources and tutorials, as well as a prototype design for the website.

STEAM education is defined by five separate competencies, which are Science, Technology, Engineering, Art, and Math. STEM education promotes critical thinking skills, proficiency with scientific literacy, and innovation. STEAM education is the inclusion of artistic disciplines to create a more cohesive education and promote better problem-solving strategies and academic skills (All Education Schools, 2018).

In the United States, STEAM education is given a high priority, developing future workers and leaders. Additionally, the US education system promises to "leave no child behind", meaning that regardless of representation or development, they still obtain a quality level of education open to STEAM fluency. This educational policy is further strengthened by the North

Star plan, which focuses on building a strong STEAM foundation, encouraging diversity of students, and incorporating STEAM into the future workforce (Committee on STEM Education and National Science and Technology Council, 2018). The North Star plan accomplishes these goals by developing partnerships, engaging students in converging disciplines, building computational literacy, and accountability.

By contrast, the STEAM education system in Panama is severely underdeveloped. Panamanian student progression develops areas of the humanities disciplines instead of STEAM disciplines. Maintenance and changes to the curricula cause disputes between employed educators and the federal government, resulting in gridlock and no reformation (Scholaro, 2018). Moreover, these disagreements further the rift between public and private learning institutions. Privatized learning institutions can act freely without government influence and private funding, resulting in adaptable and higher quality educational opportunities (Lee, 2016). Yet public learning institutions lack these factors, and therefore cannot develop their curricula.

To rectify this problem, the non-profit education organization known as Fundesteam seeks to implement STEAM education into Panamanian public schools. Fundesteam uses their yearly benefactors to fund robotics education programs for different school communities. Local teachers learn the robotics curriculum, receive materials, and then teach the curriculum to their students. With the advent of the COVID-19 pandemic of 2020, Fundesteam in conjunction with PanamaSTEM, has shifted its focus from traditional classroom robotics programs to their virtual learning platform. Steam Virtual is PanamaSTEM's virtual learning platform which supports video lectures, virtual interactive science labs, and digital robotics programming labs.

Virtual learning is one of the newest forms of distance learning and has influenced post-secondary education over the past decade. With virtual learning, educators conduct lessons remotely by providing videos and digital media, as well as using digital conferencing for live lectures. As virtual learning technology has advanced, newly developed systems and services appeal to independent educators and traditionally non-virtual learning systems. Virtual learning typically takes two forms. With synchronous learning, educators virtually conference with their students to discuss course material and maintain engagement. With asynchronous learning, teachers record and write class material for a student to study independently. With the global quarantine resulting from the COVID-19 pandemic of 2020, virtual learning became the only available option of many learning institutions. Students and educators without experience with

virtual education had to adapt to the new normal for education, which separates the typically necessary engaging context of a traditional classroom. A student's lack of motivation, or inability to adapt to the situation is an incredibly damaging factor to the student's education, especially considering that the pandemic made any other education model unsafe (Purdue University Global, 2019). To rectify these issues, educators need to adapt to these new student challenges.

The goal of the project was to assist teachers with adapting classroom content to a virtual education model. This project developed resources and tutorials as guidance for educators and prototyped a website design to house these tutorials. This project group achieved this goal by following four objectives: 1. Obtain the perspective and experience level of current Panamanian instructors with virtual learning; 2. Identify the current methods and challenges surrounding virtual learning in systems outside of Panama; 3. Conduct research and investigate virtual learning resources available to educators; 4. Develop guidelines and tutorials based on this research and organize them into a prototype website design. The first step in this investigation was to conduct archival research and interview Panamanian virtual educators.

The team first interviewed PanamaSTEM educator Alexander Cáceres and management official Víctor Rodríguez via Zoom and investigated their experience with adapting PanamaSTEM's content to their SteamVirtual platform. These interviews researched their challenges with student communication and content distribution, as well as their processes for recording robotic education videos and virtual labs. This project used Alexander Cáceres' Manual de Creación de Contenidos Audiovisuales. Alex designed this manual for PanamaSTEM educators to develop content, and the project team adapted its contents into tutorials and recommendations for content distribution services and virtual engagement tools. The project team also interviewed Densis Roniel Hernández and Jorge Hernández Huerta, two virtual educators who are professional connections of Alexander and Victor via an email questionnaire. These questionnaires further researched their adaptations to virtual learning and the challenges they faced.

The next step was to investigate sources outside of Panama to diversify the research data. The project team interviewed three U.S. based educators to investigate the influence of a STEAM focused curriculum found among certain U.S learning institutions. This cultural context informed the project team on how teachers adapted to virtual education systems, and influenced the organization of our tutorials. After these conducting interviews, the project team conducted

independent research into publicly available virtual education resources not extensively discussed during the interviews. With these investigations, the project team chose various resources believed to be the most beneficial for inexperienced and experienced virtual educators.

With this research and interview results, the project team analyzed functioning methods for online education and developed eleven tutorials and twelve recommendations for their use. We implemented these tutorials and guidelines into a prototype website to provide a convenient learning format for educators. Following this project, the plan is for Fundesteam and PanamaSTEM to expand this prototype into a full-fledged website.

After coding this project's interviews, the project team divided up the results into three areas. In the first area, Services/Techniques, the project team received recommendations for course management systems, virtual engagement tools, video lecturing, and self-teaching resources. The next project phase used these recommendations as groundwork to write tutorials about these services. In the second area, Issues/Challenges, the project team discussed with interviewees their experiences with maintaining student engagement, content creation, adaptations to virtual learning, and lack of technical resources. In the third area, Opinions, the project team gauged public opinions of virtual learning based on direct statements from the interviewees.

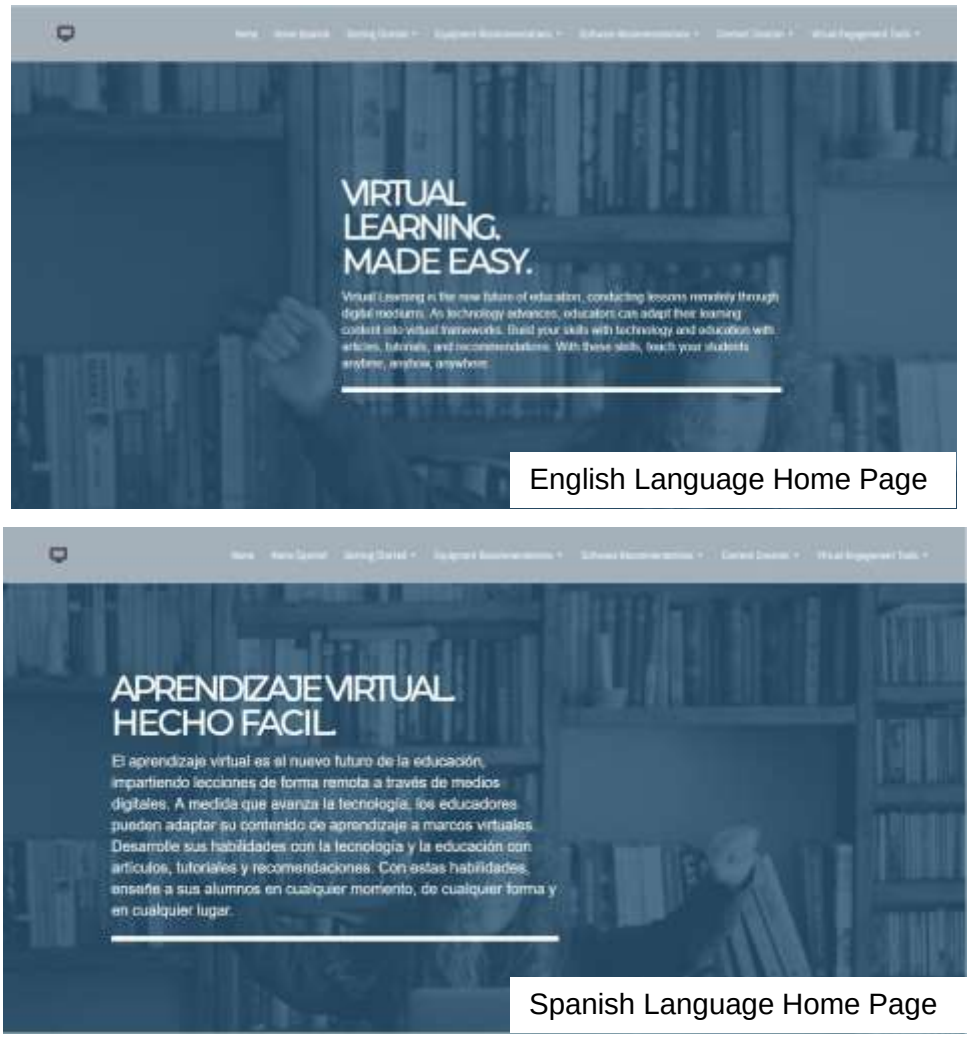

Figure E.1- Screen Captures of the English and Spanish versions of the Home Page

Altogether, this analysis influenced the website design to prioritize clarity and simplicity as the most important characteristics. The project team used the IM Creator platform to design the website because the IM Creator service automatically handled the coding and development of the website. We organized the final prototype website into five catalogues of information. The webpage for each catalogue lists links to the project team's tutorials. The five catalogues are Getting Started, Equipment Recommendations, Software Recommendations, Content Creation, and Virtual Engagement Tools. Each tutorial contains an overview of content and a step-by-step process for the use of a resource or technique. This project provided the website prototype design and developed tutorials to Fundesteam for future development of a full-fledged resource for virtual learning.

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Chapter 1: Introduction

Following the construction of the Panama Canal, Panama developed a flourishing economy through shipping activities, relationships with international companies, and growth of the Panamanian trade industry. Due to the growth of financial services and increased trading power with the completion of the canal, Panama observed a doubled increase of income per capita between 2004 to 2014 (Hausmann, Espinoza, Santos, 2017). However, insufficient educational opportunities in Panama have yielded a shortage of skilled workers which puts the country's economic future at risk. In comparison to other Central American countries, Panama has a relatively good economic situation, but the reform in their education system has been slow.

The educational system that the Panamanian government established is known as "one of the worst in the world." Despite major advances in technology, the Panamanian educational system has resisted reform for 30 years (Scholaro, 2018). For Panamanian children, the government mandates six years of primary education and three years of middle school education. The quality of teaching is significantly lower in rural areas because many families rely on the income from children laboring in the fields (Scholaro, 2018). Panama's minister of education began to improve the quality of secondary education across the country by introducing new technology in hope that more Panamanian children will have a head start in life. Approximately 87 percent of the students in Panama enroll in the public education system, but the dropout rates in the education system are high (Lee, 2016). As of 2013 the observed dropout rate for primary education was 14 percent which doubled from 6.8 percent in 2012 (Knoema, 2013). The increase in dropout rates is occurring mainly in rural areas, but attendance rates in urban areas are not significantly better.

Most primary and middle school education in Panama focuses on the humanities aspect of learning. For Panamanian students continuing on to the secondary level of education, the

curriculum is split into either a vocational or academic enhancement pathway (Lee, 2016). It is not until later in life that many Panamanian children get to experience anything outside of the basic humanities education. As completion of the education system in Panama does not guarantee a skilled labor position, the current situation provides little motivation to continue further on the current educational path (Lee, 2016).

Panama has a large gap in Science, Technology, Engineering, Art, and Math (STEAM) education in comparison to countries of the first world, but in 2014, STEM (Science, Technology, Engineering, and Math) education in Panama became a reality. PanamaSTEM started off slowly by implementing an after school hands-on learning program taught by Lorena Degracia, a certified robotics teacher in the LEGO Education program (PanamaSTEM, 2020). After many news outlets documented this new after-school robotics initiative, the program received a highly positive response from the members of the Panamanian community. PanamaSTEM decided to expand and create an extracurricular learning center in Ciudad del Saber in conjunction with Marvin Castillo of Fundesteam (PanamaSTEM, 2020).

Fundesteam is a non-profit organization which promotes development of STEAM education in Panama. Their hope is that introducing collaboration, innovation, and problem-solving techniques into Panamanian education will change the lives of thousands and break the cycle of poverty for the future of their country (Fundesteam, 2020). Their goal is to improve the resources available to children from lower-income families, such that they are able to gain a more modern education and cultivate complex skills to then transition into higher-paying career opportunities. By developing an educational path that is more likely to lead to modern complex careers, Fundesteam hopes to address the issue of inequality and poverty in Panama. The Fundesteam organization recognizes the issue within the social structure of Panamanians: those

born into poverty never experience an opportunity to escape that fate by never receiving the resources or knowledge needed to improve opportunities within their lives. Fundesteam wants to change this situation by providing easier access for low-income families to study STEAM fields (Fundesteam, 2020).

To this end, Fundesteam plans to assist teachers working with their organization by creating an interactive website to help guide teachers through this new era of virtual learning. The intent of this website is to include various recommendations of equipment, software, and virtual lab platforms for educators to use when creating their online STEAM content and lessons for Panamanian children. These recommendations include guidelines, and advice on how to use the resources to create higher quality online learning content in accordance with the Panamanian government. Our project team worked with Fundesteam to complete this goal and develop this virtual resource for their educators.

Our project involves interviewing educators (See Appendix A and B) inside and outside of Panama to compile research of successful programs and techniques to create online learning content. In these interviews the team investigated the challenges and issues teachers have faced when creating their content, and gathered their opinions on virtual learning. After conducting these interviews, the team implemented a categorization coding process (See Appendix I) to identify resources commonly used by current educators along with common struggles and issues. From these interviews the team noticed a common trend of struggling to engage students virtually and planned to emphasize services that educators can utilize to address this issue. After conducting interviews with Panamanian educators the team identified three cultural issues that may affect our project: a lack of STEAM education in Panama, a resistance to reform education

from Panamanian educators, and issues pertaining to the availability of technical resources to students at home.

Following the interview process, the team researched various online learning methods and teacher techniques and created a set of recommendations to include in our website. In addition, Fundesteam asked us to provide tutorials and instructions on how to use these new materials so their teachers can effectively implement them into their curricula. To complete this goal, the project focused on researching and writing these guidelines. Following the establishment of a compilation of recommendations and written tutorials, the team designed the website deliverable. The team designed this website with a simple, aesthetically pleasing design tailored to educators with novice level of technological experience, while still providing useful information for educators with all levels of technological experience. With these guidelines for educators, Fundesteam can improve the STEAM education for Panamanian children.

Chapter 2: Background/Literature Review

This chapter discusses STEAM education, Panama's education system, Fundesteam and the work they are doing to improve STEAM education in Panama.

2.1 The Importance of STEAM Education

STEAM education is typically defined as the preparation of students in skills and competencies that fulfill five subjects (Science, Technology, Engineering, Art, and Math). A successful STEAM education takes the concepts and builds them on to one another enabling students to utilize the resultant knowledge for real-life applications (Eberle, 2010). A STEAM education program cultivates children with good critical thinking skills, a higher proficiency in science literacy, and enables a younger generation of innovators (All Education Schools, 2018). STEAM strives to strengthen the foundation of STEM by enhancing students' critical thinking skills and promoting awareness of the intersection between art and liberal arts in conjunction with art, science, technology, engineering, and math. A STEAM education program provides students with methods to create new strategies for problem-solving, analyzing data, innovation, and brings together multiple fields for a cohesive education (All Education Schools, 2018.).

With this sense of innovation, educators are developing younger generations that can produce new products and processes that sustain the world's economy. As STEAM field occupations dominate the list of fastest growing occupations according to the U.S. Department of Labor (All Education Schools, 2018), many jobs in the future will require a basic understanding of math and science. Figure 2.1 depicts the U.S. Bureau of Labor's projected growth rate of STEM occupations from 2014 to 2024. The figure predicts that Mathematical Science occupations, STEM-related postsecondary teachers, and computer occupations will dominate the

list of growth rates for the upcoming years (Fayer, Lancer, Watson, 2017). As shown in the figure, it is crucial to expose younger generations to STEAM learning to ensure a higher possibility of success in the workforce later in life. STEAM education seeks to integrate technical principles to create a more holistic understanding of the world while providing more knowledge on how to pursue a career in more innovative fields in the workforce.

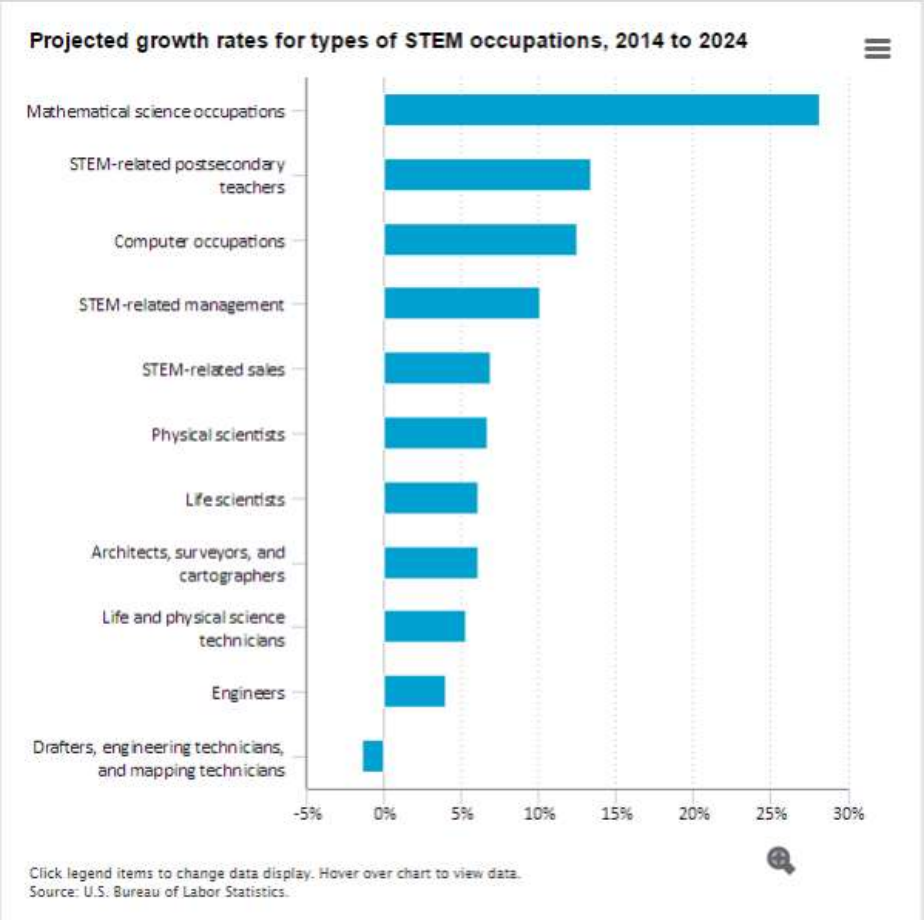

Figure 2.1: Projected Growth Rate for STEM occupations between the years of 2014 to 2024 from the U.S. Bureau of Labor Statistics (All Education Schools, 2018.)

2.2 STEAM Education in the United States

In the United States, education researchers recognize that the world is forever changing and becoming more complex. There is the belief that the nation's youth should attain knowledge and skills that will enable them to solve problems, evaluate given evidence, and come to logical conclusions. The US educational system aims to develop future workers, neighbors, and leaders among the children in the nation. The educational system engenders youth with the ability to solve more complex challenges of the real world and meet any potential demands of an evolving workforce (Committee on STEM Education and National Science and Technology Council, 2018). Additionally, the educational system in the United States strives to make sure that "no child is left behind"; such that no matter where they live, children still have access to a quality learning environment in which they could gain STEM fluency (Committee on STEM Education and National Science and Technology Council, 2018).

In December of 2018 the United States put the "North Star" Plan, a federal strategy, in place for the upcoming five years to foster a future where all Americans have access to high-quality STEM education and enable the country to soon be the global leader in STEM literacy and employment (Committee on STEM Education and National Science and Technology Council, 2018). The "North Star" Plan pursued three goals: 1) build strong foundations for STEM literacy; 2) increase diversity, equity and inclusion in STEM; 3) prepare the STEM workforce for the future. The US Department of Education incorporated this "North Star" Plan into the US educational system to ensure every American receives the opportunity to master STEM concepts and yield a STEM-literate public more equipped to understand rapid changes in a technological-driven environment (US Department of Education, 2020). The United States set a goal to provide STEM education to students who are historically underserved or

underrepresented. The US strives to build a stronger educational foundation so that underserved and underrepresented children receive access to high-quality education and also equality within STEM field employment. In addition, the "North Star" Plan strives to bring unique learning experiences regardless of a vocational or college-educated pathway and prepare and encourage learners to pursue careers in the STEM field (Andre, Durksen, & Volman, 2016).

This federal strategy includes four components to represent a cross-cutting set of approaches to implement federal actions needed to achieve the goal of this program. The four elements of this plan are: 1) develop and enrich strategic partnerships; 2) engage students where disciplines converge; 3) build computational literacy; and 4) operate with transparency and accountability (Andre, Durksen, & Volman, 2016). The US Government hopes to improve the interpersonal connections of educational institutions, communities, and employers to bring an array of resources to strengthen STEM education within the nation. The government believes establishing community and resources will facilitate educators adding meaningful and real-life experiences into the curriculum. This enables instructors to engage and inspire more students while introducing new digital devices and technology that have transformed our ever-changing society. The program also calls for the Federal Government to open evidence-based, decision-making, and more complex STEM programs, activities, and investments (Andre, Durksen, & Volman, 2016). With the four key components, they hope there is more potential to empower employers, educators, and communities for the benefit of all learners at any level. President Trump's administration invested nearly $540 million into supporting Science, Technology, Engineering, and Mathematics education in November 2019 (Committee on STEM Education and National Science and Technology Council, 2018).

2.3 STEAM Education in Panama

The educational system in Panama is one of the most poorly performing in the world after 30 years with little to no reform (Scholaro, 2018). As children progress through the educational system in Panama, their classroom education focuses more on the humanities subject matter rather than STEAM-based subjects. The maintenance of this outdated curriculum is mainly attributable to structural issues found within the educational system. Attempts to change curricula tend to cause disputes between employed and unionized educators and the Federal Government, resulting in gridlock. This roadblock prevents any necessary educational reform from taking place (Scholaro, 2018). Furthermore, these disagreements cause a divide between the public and private educational institutions. Private educational institutions are able to freely reform the education style within their institutions without interference from the government. This gives students enrolled in private education "a head-start in life" (Lee, 2016). Consequently, a STEAM educational curriculum is relatively non-existent within basic Panamanian life.

2.4 Fundesteam

In 2014, the first group of Panamanian school children attended the World Robotics Olympics competition held in Sochi, Russia. The delegation finished second to last out of 65 participating countries across the world, including over 70,000 children. This defeat motivated the creation of Fundesteam (Fundesteam, 2020).

Panamanian children born into low-income families rarely receive the opportunities necessary to escape poverty and this perpetuates a cycle of desperation. Fundesteam's goal is to structure the implementation of STEAM education into Panamanian public schools to develop the skills necessary for high-paying careers and reducing poverty. Fundesteam uses their yearly

benefactors to expand educational programs for different school communities. Local teachers learn robotics and receive materials to help conduct classes on programming and robotic design. As shown in the figure below, Fundesteam distributes a large amount of LEGO robotics kits to aid teachers in creating robotics programs for their schools. The robotics program creates a self-sustaining cycle of knowledge for children in those communities (Fundesteam, 2020).

Figure 2.2: Marvin Castillo CEO of Fundesteam representing Fundesteam as they donate LEGO robotics kits to a Panamanian School (Fundesteam, 2018.)

As of 2020, Fundesteam has helped over a thousand students compete in national level robotics competitions by creating or improving outreach robotics education programs associated with different educational institutions. Through Fundesteam's work, over sixty students have participated at the international level in robotics competitions within the past six years. A survey conducted by the Pan American Development Fund of over 1600 participating students indicated that 90 percent of participants were motivated to go to college after engaging in these programs (Fundesteam, 2020).

2.5 PanamaSTEM

PanamaSTEM is one of the primary educational institutions which collaborates with Fundesteam. PanamaSTEM is an extracurricular educational institution for school children grades K-12 with a focus on STEM fields. PanamaSTEM specializes in robotics engineering through the use of LEGO educational materials and LEGO Mindstorms. These programs help children develop a logical mindset, create prototypes, and promote teamwork.

With the advent of the COVID-19 pandemic, PanamaSTEM has shifted their focus entirely to their online learning platform, known as STEAM Virtual. STEAM Virtual supports video lecture courses, virtual interactive science labs, and digital robotics labs in which a student will create, program, and test their own virtual LEGO Mindstorms robot in a virtual environment (PanamaSTEM, 2020).

2.6 Virtual Learning

Virtual learning (or online learning or "e-learning") is a method where teachers conduct lessons remotely as opposed to a classroom setting. It is one of the newest and most popular forms of distance learning; and within the past decade, virtual learning has made a major impact on post-secondary education (Stern, n.d). Teachers and professionals alike upload online versions of their regular classroom offerings and provide as much or as little extra help as they see necessary. Online learning has continuously matured as availability of software and personal technology has evolved. Over the past two decades, there has been a steady rise in Massive Open Online Classes (MOOC) among premiere universities across the globe, such as Massachusetts Institute of Technology, Harvard University, Indian Institute of Management, and Oteima University in Panama (Chanda & Ghosh, 2020).

With the maturity of technology, online content has become readily available and easier for teaching professionals to accommodate distance learning. With technology advancing, Course Management Systems like Blackboard, Canvas, and WebCT enable instructors to easily design and deliver online content for their courses with a flexible framework. These services permit teaching professionals to create postings, schedules for deadlines, forums for announcements to communicate information immediately to all students, discussion boards to support asynchronous discussions and questions for instruction, modules to publish and view course content in easy to follow sections, and specified areas for assignments, tests, and quizzes that easily update gradebook postings (Stern, n.d.).

Advances in technology allow virtual learning to take two different forms. Instructors can upload live lecture content or choose to do the opposite with "asynchronous" learning in which instructors upload pre-recorded content. Live instruction, or "synchronous" learning, provides both the instructor and the student with regular check-ins and ensures students stay current with instruction. Asynchronous learning makes students responsible for keeping up to date on content and grants flexibility to at-home lifestyles. With the 2020 worldwide Pandemic of COVID-19, many universities, schools, and colleges moved to online learning to create a safe environment for faculty and students during an unprecedented time. The social changes that came with the COVID-19 pandemic generated new opportunities to create a stronger education for those who normally might not be able to receive one.

Virtual learning offers the opportunity for students across the globe to access the same class content simultaneously. Implementing concepts like remote learning in the future opens up the opportunity for universities and schools alike to bring more online content to students worldwide. Before this change many post-secondary institutions that have previously taken part

in online education have been cautious in their offerings and limited the scope to more short-term/part-time courses, which catered to working professionals (Chanda & Ghosh, 2020). During this pandemic, instructors from many colleges, universities and schools across the globe made all types of content available to their students, including labs and courses that students would normally complete through hands-on instruction.

The 2020 pandemic compelled higher education institutions to branch out and explore using online learning to extend course availability remotely to students. The switch to online courses made individuals consider how to design more accessible courses for instruction. After using virtual learning during the COVID-19 pandemic, the possibility of expansion in availability and accessibility of this style of learning became more feasible for the near future.

Virtual learning comes with benefits and challenges. It is a difficult adjustment for students and teachers, but once fully adapted it offers many benefits. Fortunately, with the idea of online learning, instructors can educate numerous students simultaneously. In addition, online learning addresses the needs of students who might not be able to, or chose not to participate in, a traditional classroom setting. This method aids students who cannot attend traditional settings, who live in remote locations, who cannot find the specific content at their particular school, or who just prefer to work independently to receive the benefits of a wide-ranging education (Stern, n.d.). Online learning students determine the amount of their involvement, the time they choose to learn, and the location where they participate. To have a successful experience with online learning, students should meet three basic requirements: have access to a computer or similar technology; have access to the Internet; and have basic motivation to succeed in a non-traditional classroom setting. Course environments like these are highly beneficial for those who need to fit education into busy schedules. Through asynchronous learning, students have the flexibility to

complete lectures, requirements, and assignments at their leisure. Students are able to fuse work and education into life.

Individuals may encounter challenging issues when dealing with virtual learning, whether it is instructors adapting content to an online format or students managing to successfully complete an instructor's online curriculum. Problems can occur for both students and teachers including committing the additional time to adapt when moving from a traditional setting to a virtual classroom. Along with transitioning between the two environments, it is fairly common for students and instructors to experience technical issues. Many people may not have access to high bandwidth, or a reliable Internet connection needed to complete online courses (Kumar, 2015). These obstacles can make it difficult for both parties, whether uploading or attempting to receive classroom content. Others may even have issues at home with their devices; older computer models or older Wi-Fi interfaces making it more difficult to view a course management system or may not meet appropriate technical requirements like available Wi-Fi data capacity.

Students' challenges differ from those of instructors when completing online learning content. To successfully navigate through an online course, students have to maintain time management, self-motivation, and good computer literacy. Without these one may see a decrease in performance from students. Computer literacy is an important skill for a student's success in online learning. To participate a student needs to know how to log in, engage in classes, submit work, and communicate with instructors and classmates to ensure success in the course (Purdue University Global, 2019). Online courses demand time and intense work and the courses can be seen as more difficult. Without self-motivation, individuals begin to lose their sense of discipline and time management skills. If students do not stay engaged, complete tasks, and make progress,

they will fall behind and their actions may result in a negative outcome (Purdue University Global, 2019). When completing online learning, most students take their courses from their residence which provides a comfortable environment that may be more tempting for procrastination and straying from work that they need complete. Any or all of these behaviors can cause a student to fall behind and eventually drop a course.

In addition, teachers have their own unique set of challenges when it comes to producing online-learning content. Some educators are technically challenged. To ensure success for both parties, educators must be able to manage basic programs, and navigate through fixing issues (Kumar, 2015). Along with technical challenges, educators may have limited access to technology when teaching from home causing lower quality of online content (i.e. poor audio and visuals) which may be disruptive for the student. Technical challenges can prohibit instructors from delivering the best possible online education content to students.

To continue enhancing online education experiences for students, educators need to be creative in finding supplements to accommodate their normal classroom styles. Due to the nature of online learning, the majority of course content students will complete from home. Since students may have difficulty focusing in a more comfortable environment, educators face the challenge of producing more engaging content. Creative educators can foster a sense of comradery within the online experience and alleviate the discomfort for those students who dislike the reduction in the sense of community that comes with online learning.

There are many benefits and challenges that people face with the new innovation of online learning. With some creative thinking and logical reasoning educators and students can minimize challenges faced when participating in online learning and the benefits both parties receive can increase with new tactics. With innovative approaches to releasing content, educators

can help engage their students, foster a sense of community, and strengthen their students' personal skills. The addition of Fundesteam's interactive online resources will potentially supply teachers with knowledge needed to create high-quality content, aid in implementing engaging education, and most importantly, reap benefits for both educators and students.

Chapter 3: Methodology

The project goal was to develop a virtual resource with tutorials and materials to assist and inform educators on how to create and distribute online learning STEAM education content. This project then organized these tutorials into a detailed instructional website for Panamanian educators. The objectives to complete this goal are outlined as follows:

1. **Obtain the Perspective of Current Panamanian Instructors.**

To better understand the situation of education in Panama, the team investigated current research and resources related to the conduction of virtual education in Panama as a response to the COVID-19 quarantine. This research primarily centered around conducting interviews of PanamaSTEM educators to examine their work in creating online learning content and interviewing their professional connections.

2. **Identify Current Methods of Virtual Learning and the Challenges.**

In order to acquire new data and import information from other sources into Panama, our team interviewed United States educators to obtain qualitative data about their individual successes and failures with online learning. By sourcing materials and experience from outside of Panama, our intent was to expand our investigation beyond Fundesteam and PanamaSTEM's previous work with virtual education and identify current best practices for creating online content.

With these two objectives, the project team interviewed seven individuals involved in virtual learning in some capacity. Table 3.1 lists these interviewees in chronological order.

Name	Location	Date of Interview	Method of Interview	Involvement with Virtual Learning	Demographic of Students
Alexander Cáceres	Panama	09/02/2020	Video Conferencing	Educational Content Creator	Students 6-17 years old
Victor Rodiriguez	Panama	09/02/2020	Video Conferencing	Franchise Developer and Educators	Students 6-17 years old
Gianna Pechia	United States	09/08/2020	Video Conferencing	High School Teacher	9th Grade Students
Michael Costello	United States	09/09/2020	Video Conferencing	High School Teacher	9th-12th Grade Students
Jennifer Nygren	United States	09/12/2020	Video Conferencing	Elementary School Teacher	5th Grade Students
Densis Hernández	Panama	09/16/2020	Questionnaire	Secondary Teacher	7th-10th Grade Students
Jorge Huerta	Mexico	09/22/2020	Questionnaire	LEGO Mindstorms Instructor	Students 11-15 years old

Figure 3.1- Table of Conducted Interviews

To analyze the interview data of both Objective 1 and 2, the project team studied the transcripts of each interview and categorized every theme into three areas. We summarized interviewee experiences which are specific problems with virtual learning and listed them in the Issues/Challenges area. In the Services/Techniques area, we listed services or techniques which the interviewee used for their virtual education experiences. If the interviewee held a specific opinion about a facet of virtual learning, the project team placed these notions in the Opinions area. The listings for each area were organized in a spreadsheet by row, and the interviewees were organized by column for each spreadsheet(See Appendix I). If a specific Issue/Challenge,

Service/Technique, or Opinion, was mentioned across multiple interviews, the project team would check the corresponding box for the specific data point and each interviewee who mentioned the data point.

3. **Conduct Research and Investigate the Resources Available to Educators.**

Following the interview process the team continued to research publicly available resources for educators. The team continued to investigate different online education platforms and resources they have personally encountered in their educational careers. Our team investigated other Internet sources they encountered while continuing their research process. By sourcing materials outside of the interview process, our intent was to further our investigation to resources that some educators may not have been previously encountered.

4. **Develop Guidelines and Tutorials for Resources for the Website.**

With our acquired data, our project team wrote and produced detailed articles and tutorials for Panamanian teachers. We designed these tutorials to cover all necessary introductory information for an educator to create their own virtual content, elaborate upon the best creation practices, and offer resources and recommendations for the benefit of their created lessons. To make these tutorials and guidelines publicly available, this project prototyped a basic website which organizes this information into a user-friendly format, and provided this prototype to Fundesteam to expand upon and host on their servers. By educating teachers about this method of delivery, our project can directly improve the quality of online STEAM education content available for Panamanian students.

3.1 Obtain the Perspective of Current Panamanian Instructors.

The first step in this investigation was to assess available research related to the state of virtual learning in Panama and to conduct interviews with those involved in Panamanian virtual education (See Appendix A). Our first point of contact was PanamaSTEM, due to their extensive collaboration with our sponsor Fundesteam. The team first interviewed PanamaSTEM educator Alexander Cáceres and management official Víctor Rodríguez. This interview investigated PanamaSTEM's experience during the transition of many learning institutions into virtual learning during the COVID-19 quarantine. When designing the questions, the team wanted to look into their processes with virtual learning before and after the COVID-19 pandemic. The team made questions to harvest a discussion on the various processes the educators have used to create their content (online, in-person, pre/post-pandemic). Our team made sure to discuss any challenges the educators faced with communication with students and delivering content. These questions also targeted the resources the group used to teach kids virtually in an interactive matter.

Following the interview, Alex and Victor provided the project team with multiple deliverables and many different platforms that PanamaSTEM uses for education and assessment, as well as the Manual de Creación de Contenidos Audiovisuales. Alex designed this manual for PanamaSTEM educators to help develop their organizations educational content. The team researched and adapted these available resources into the content of the project's tutorials and guidelines. Some examples of these resources are virtual platforms for distribution of content and assessment (ie. Moodle), and virtual engagement tools for a gamification of learning content (ie. Mindstorms, Lego Designer, etc.)

Our interviewees Alexander Cáceres and Victor Rodriguez had connections with educators in Panama and other countries who are also currently working with online education. The project team made use of these connections to interview Densis Roniel Hernández, independent Panamanian educator, and Jorge Hernández Huerta, an independent Mexican educator, both of whom are involved in virtual learning.

The team conducted these interviews in two different methods. For educators who speak fluent English, the team conducted these interviews live with the Zoom video conferencing application. For educators who primarily spoke Spanish, we conducted these interviews by asking all the questions in Spanish via email (see Appendix C) and receiving responses in Spanish for subsequent translation. The goal of these interviews was to study how instructors in Panama succeed and struggle specifically with certain aspects of virtual learning and identify any steps taken to overcome obstacles. By asking these educators questions like A.6 and A.12, the team hoped to start a discussion about the various styles of content they have created for virtual learning along with examining the virtual resources they use when supplementing their curriculum. These questions exposed this project team to many different virtual platforms that the Fundesteam educators incorporated within STEAM Virtual. Through asking questions like A. 13, A.16, and A.17 the team tried to foster a discussion on the challenges and successes these educators have noticed when dealing with the switch to online learning. From these questions the team was able to narrow down which processes were successful and which ones were not.

3.2 Identify the Current Methods of Virtual Learning and the Obstacles.

The next step in this project was to investigate sources outside of Panama to diversify our research data. The team further refines their data by interviewing educators engaged in virtual

learning from the United States with the same interview questions (See Appendix A). Much like our process of interviewing in Panama, the team interviewed three U.S educators and studied the struggles and successes of their work with virtual learning. However, the team conducted the interviews with the cultural context of the U.S' in mind and discovered techniques being implemented in an area with a more established STEM curriculum and the typically greater access to technology. As a result of this context, our project team further developed our understanding of virtual learning and included expertise based in this cultural context into our tutorials and guidelines.

Following the last U.S educator interview, the team further investigated the practices of educators outside of Panama in South America. Our project team was given additional contacts from Victor Rodriguez including educators from Mexico and Puerto Rico. The team continued to interview and receive a response from an educator named Jorge Hernández Huerta, who teaches LEGO robotics in Mexico. Much like the other interview processes, these encounters highlighted the struggles and successes of educators when working with Online learning. The team conducted the interviews with the educator from South America via email by providing a questionnaire (See Appendix C) to the educators entirely in Spanish and receiving responses in Spanish for subsequent translation.

3.3 Conduct Research and Investigate the Resources Available to Educators.

Following the interview process the next phase of the project involved continuing to conduct archival research to discover more publicly available resources for educators. When evaluating these platforms, the team gauged the level of education the platforms served best, the classroom content that the platform enhanced, and if the user experience was simplistic. After

discovering these platforms our team analyzed which platforms were easy to use and can be incorporated into K-12 education and further explored their capabilities to compose guidelines and tutorials for these resources.

3.4 Develop Guidelines and Tutorials for Resources for the Website.

With our interview results, our research, and Fundesteam's previous work with developing guidelines for online learning content, our project team analyzed functioning methods for online learning and developed our tutorials. The project team created all resource tutorials and recommendation compilations and did not utilize tutorials already available on the Internet due to possible copyright infringement. Some examples of these tutorials include webcam setup, video lecture recording and editing, and creating an email address for student contact. Upon creating our tutorials and recommendations, we stored our documents in an organized digital drive for Fundesteam to use when they develop their website. The team compiled our files into folders that directly corresponded to catalogues our team planned to implement in our simplistic website design.

As the team created tutorials and guidelines, we implemented some of this information into a prototype website using IM Creator, a web page creating services and organized into a convenient format for Panamanian educators. The project team designed this website to appeal to educators with little to no experience with virtual learning and to provide a structured list of resources to assist in the creation of online learning content. We provided the website prototype design and developed model tutorials to Fundesteam for future development of a full-fledged resource for virtual learning.

3.5 Summary

Through the objectives stated above in this methodology chapter, the team gathered a multitude of important information on resources and processes used in online learning. These aspects influenced our project's education tutorials and web page, allowing the project team to create informative lessons for improving the quality of online STEAM education content across Panama.

Chapter 4: Interview Analysis and Deliverable Development

Following the objectives of our project, our team conducted seven interviews and developed our website deliverable for our sponsor. This chapter discusses the findings for each interview (Appendices C through H contain the full interview transcripts), our analysis of these findings, and their influence in the development of our tutorials and our website design process.

4.1 Individual Interview Findings

Alex Caceres and Victor Rodriguez Interview:

To start off our interview process, our team decided to interview the educators directly working with Fundesteam and their students. The team interviewed two Fundesteam educators, Alex Caceres and Victor Rodriguez (see Appendix D for full interview transcript) simultaneously. In the interview, both Fundesteam educators stated that they use various platforms/gamification services like *Virtual Robot Games*, *Lego Mindstorms*, *Hour of Code*, etc. to teach their robotics curriculum virtually. They mentioned that they use *Microsoft Teams* and other Microsoft based services to communicate and collaborate with their students and fellow educators. Alex and Victor discussed having students without working audio, faulty microphones, no web camera, or even some students without access to a computer. In addition to these issues, the educators at Fundesteam discussed how challenging it was to teach some students when the students do not know how to use virtual meeting services like *Microsoft Teams*. These two educators explained other challenges they have faced during asynchronous learning such as students not showing up to class, or falling asleep during class.

During this interview, Fundesteam educators disclosed a few cultural issues that they viewed may be a challenge to our project. The three issues that the Fundesteam educators

notified our team of were: Lack of STEAM education in Panama, teachers' resistance to reform education, and the lack of availability of technical resources at home.

1. Lack of STEAM Education in Panama

The current educational system in Panama has seen little to no reform in thirty years. Fundesteam has been working for a few years to expose Panamanian children to STEAM education. As much as Fundesteam is working to get STEAM education to children all across the country, they still have to work through getting approval from the government for every school where they would like to implement a STEAM program. Furthermore, there are funding limitations, where the Fundesteam organization has to apply to receive grants. Many of the grants they receive are to implement programs in specific schools in Panama designated by the company distributing the grant.

2. Teachers Resistance to Reform Education

Within Panama many teachers resist the change to more technical learning, they favor the traditional practices of a textbook and worksheets. Even when Fundesteam implemented their STEAM Virtual platform along with their in-class programs, many teachers did not want to spend time learning the program to receive the students' grades. Specific to this issue, Alex Caceres opined "Yeah, I don't know how to call it, but let's say they're not too tech primy or tech savvy, and when we tell them hey we're going to teach a new class but there is no book, but you're book is a website. They go wait wait wait what's going on something change here, I do not know how to use it and they do not feel comfortable". Alex and Victor believe that only a small number of teachers in Panama have made the jump to virtual learning, or even started to implement modern day technology into their curriculum.

3. Lack of Availability of Technical Resources at Home

Some students have faced issues at home when trying to work on the STEAM Virtual platform during the Pandemic because they might not have a computer at home, especially one with a microphone or camera to participate in synchronous lessons. Although Fundesteam is currently working to receive grants to provide schools with computers for students to take home if they do not have one.

Gianna Pecchia Interview:

Following our interviews with the teachers working with Fundesteam, our team began to interview teachers outside of Panama, starting with personal contacts in the United States. The first U.S educator we interviewed was Gianna Pecchia (see Appendix E for full interview transcript) who works at a charter school in Rhode Island, where their students mainly learn through virtual learning techniques. At this charter school, Gianna tends to work with children who come from lower income families. Gianna Pecchia teaches a 9th grade math class at this school where her students learn 60% of their math curriculum through asynchronous lessons online. At this specific charter school, the students learn all subjects except Math and English asynchronously, but for Math and English 60% of the curriculum is completed asynchronously and 40% is completed through in-person help and examples. In Gianna's case, she acts as the in-person teacher that supplements her students asynchronous learning. Gianna herself does not create the asynchronous lessons. Instead, another virtual instructor produces the lessons. Gianna reinforced the idea that students have a tough time learning asynchronously and maintaining attention to the lecture. She discussed that her students began to fall behind, they became frustrated and fell further behind. Gianna said she noticed issues with students lacking technical resources at home. Upon entry, the charter school provides their students with a computer.

Gianna noticed during the COVID-19 pandemic her students had to share their computer with their siblings who were also learning virtually because of the lack of technical resources at home. This is how she explained this accessibility challenge for her students. “Some of our other students say the ninth graders are the oldest sibling of four or seven or whatever, and then we send our kids home with a computer. Every single one of our kids were sent home with a computer because we have them in school and they went home with them. But if that's now the only computer they have in their households and they have four siblings doing distance learning, they would all be sharing it" (Gianna Pecchia). Gianna exposed our project team to several new platforms that she employs to help her students understand the material. She discussed platforms like *Khan Academy* and *IXL* which she uses to reinforce specific topics that some students may not have fully grasped from the lectures, as well as services such as *Teachers Pay Teachers* and *Canva*, which help teachers create content. At the end of the interview with Gianna Pecchia our team discussed her opinion on how effective virtual/asynchronous learning is compared to a traditional classroom setting. Gianna Pecchia said she believes that virtual learning is not beneficial to all types of students and that there are a select group of individuals she believes can prosper through virtual learning techniques.

Michael Costello Interview:

The next interview our team conducted was Michael Costello (see Appendix F for full interview transcript), another U.S. educator who works as a public high school history teacher. Michael had to move to virtual learning during the COVID-19 shutdown of 2020 and his specific school decided to continue distance learning for the start of the 2020-2021 school year. During this interview he explained the services and practices he used when creating his online learning

content. Michael and his school chose the course management system *Google Classroom* for content distribution and synchronous lecturing of his classroom. Through the switch to virtual learning he decided to continue to use the same content in his normal classroom setting such as *PowerPoints* and study packets, but he altered the way he presents the information. Between synchronous lecturing via *Google Meets*, Costello chose to record videos with his phone for his students to watch. In the videos, he would quickly highlight the key topics that they should know. Michael circulated short Youtube videos to his students to help them study the material outside of their regularly scheduled lecture time. After Michael's school district decided to continue distance learning into the beginning of the 2020-2021 school year, Michael's school offered him and his fellow teachers the option to work inside their classrooms without the children. In our interview, Michael Costello stated he was eager to employ additional resources in his classroom such as a document camera, chalk board, and interactive white board display for education (*SmartBoard, Promethean board*) to enhance his abilities to lecture virtually.

Michael Costello described the issues and challenges he faced during this time period. Similar to the other interviewed teachers, he noticed a few challenges such as maintaining students' attention during virtual learning lessons and getting students to participate in their class meetings. Michael Costello also discussed how creating/adapting his curriculum into a virtual format took countless hours of work. This posed a huge challenge for him because creating content was not the only task he had for school. When talking with Michael the team noticed that he expressed a slight resistance to learn new technological processes to ease the creation of classroom content. Michael stated that after thirty-four years of teaching he only has a few years left, and he believes that his time would be better spent not learning new programs considering he might not see the full benefits of learning these programs in the remaining course of his

career. Additionally, Michael expressed that over the 34 years of teaching he has a wide array of premade content that he can choose from and use . In response to an inquiry about his opinion on the effectiveness of virtual learning, Michael stated that it was not as effective as a normal classroom setting considering maintaining students' attention virtually is tough. "I think it went as well as could be expected... I don't think that any virtual setting can match that dynamic of a classroom. …[T]here's that back and forth, being the kids and the instructor and it just, it's kind of like magic. It's kind of hard to experience that virtually." (Michael Costello). He also indicated that he believes the difficulties found with virtual learning can outweigh the benefits of this given method. Although Michael did state that virtual learning allowed students to at least learn and understand the minimum requirements of the content and that introducing new subject material through virtual learning processes may be beneficial.

Jennifer Nygren Interview:

The last interview our team conducted with a United States based teacher was with Jennifer Nygren (see Appendix G for full interview transcript), a 5th grade teacher at a private K-8 school. Jennifer had recently just attended a professional development conference for teachers to learn more about virtual learning and services to implement in their curricula. Because of this professional development conference Jennifer Nygren had many services and techniques to share with us. Nygren expressed that before the COVID-19 pandemic of 2020 she had been using Google Services (i.e. *Google Classroom*, *Google Docs*, and *Google Forms*) for educational purposes. She also explained that she has hosted a website for her students, with helpful links and sources, for 12 years now. On her website, Jennifer has resources for her students to help them better understand their content such as *IXL* and *Quizlet*. Jennifer mentioned

she had her students complete a video project asynchronously last spring and then she distributed the kids' videos to other students and families via *Dropbox*. Jennifer stated that transferring the students' video files into *Dropbox* for distribution took countless hours. During her professional development conference, Jennifer learned about a new platform called *Flipgrid*, where teachers can assign a video project with all directions. Students complete and save the projects on *Flipgrid* and each video assignment is automatically sent to the teacher. Jennifer shared with us a few of the techniques she employs to create her lectures for her students. During lectures Nygren will use her attached web camera as a document camera by facing the camera towards the table top and writing notes on a sheet of paper. Jennifer utilized *Screencastify* to share her screen when needed along with *Explain Everything*, a virtual white board service to convey her content to her children.

Over the course of time that Jennifer has spent teaching virtually she has noticed a few issues herself. Some challenges that she described included having difficulty maintaining kids' attention without having a physical presence, along with the creation of content taking several hours to develop. Jennifer noticed a small portion of her students becoming extremely overwhelmed with virtual learning, as it was a new and unfamiliar process. Jennifer's final thoughts involved comparing virtual learning to in-person instruction. Jennifer Nygren explained how she believes that it is challenging to distance learn with younger kids due to their lower attention spans. She believes that when an instructor implements virtual learning processes, the instructor's expectations for students' work quality is lower due to less student accountability without an in-person presence. Jennifer also discussed her view that as a teacher and a parent she feels that virtual learning is not as effective as in-person lecturing because it does not fit the needs of all different types of learners. "Absolutely not. It's not even close. Not even close. So,

you don't have student contact, you don't have that interaction... I feel really badly for these kids. I feel badly for my kids who are in college. Some kids just think they just don't learn this way. And it stinks, so no." (Jennifer Nygren). Finally, Jennifer emphasized her concern for her students and other children going through this adjustment period to virtual learning.

Densis Hernandez Interview:

Following our interviews with educators inside the U.S. the project team reached out to the personal contacts we received from Fundesteam educators Alex and Victor, to continue our investigation outside the U.S. This section covers our interview with Densis Hernandez (see Appendix H for full interview transcript), a Secondary Mathematics teacher in Panama through a Spanish translated questionnaire sent via email. The team then translated the response back to English. Densis employs *Zoom*/*Google Meets* meeting platforms to complete synchronous lectures and *Microsoft Whiteboard*/*Google Jamboard* to share his content with his students. Hernandez mentioned using content services like *Khan Academy* and *Geogebra* with his students to reinforce the content learned in lecture. During his eight months teaching virtually, Densis has encountered various issues with his students including struggling to maintain the students attention, or purely students having connectivity issues hindering their ability to participate in lessons. Our team asked Densis what he views is a large challenge he has faced when connecting with his students virtually, he said "Finding initiative in them, but I see that youth do not take advantage of the benefits of access to information, we must cultivate this generation, I always remember Albert Einstein's phrase, technology would make man mediocre, if it takes over everything." (Densis Hernandez). When asked his opinions on the effectiveness of online

learning compared to in-person lectures, Densis stated that maintaining the students' attention is tougher, causing virtual learning to become less effective.

Jorge Hernández Huerta Interview:

We completed our investigation of educators outside the U.S. by contacting Jorge Hernández Huerta (see Appendix I for full interview transcript), another one of Alex and Victor's contacts. Jorge is a robotics educator for students 11-15 years old in Mexico. For this interview we sent Jorge Hernández Huerta a Spanish questionnaire via email. To teach his students synchronously, Jorge implemented the virtual meeting service *Zoom* to host his lectures. Along with his lectures he uses the *Lego Mindstorms* software to teach robotics programming, and the *Virtual Robot Games* website to provide his students with premade challenges as assignments. Jorge explained his implementation of email as his main form of asynchronous communication with his students. Throughout the past few months, while Huerta has been involved with virtual learning, he has noticed his children have a hard time keeping up with virtual asynchronous communication. Jorge stated "Well, since I have elementary school children, it is more complicated for them to pay attention to the communications by mail so in the sessions it is better to tell them things." (Jorge Hernández Huerta). He explained that creating virtual learning content takes many hours. When asked about the effectiveness of virtual learning Jorge opined that virtual education has worked to introduce new content and skills, and if it has been successful, it is a useful process, but he notices that students no longer want to continue virtual learning.

4.2 Interview Cross Analysis

After applying the coding process to each of the seven conducted interviews, the project teams isolated several common themes throughout the three coding areas of Services/Techniques, Issues/Challenges, and Opinions.

Services/Techniques:

Within the Services/Techniques area (See Appendix J.1), the project team received several recommendations from each of the seven interviewees, all mentioning a variety of services or techniques (summarized in Figures 4.1 and 4.2). However, each of these recommended resources fall into one of the four following categories.

1. Course Management Systems

Five of the interviewed educators mentioned using a course management system to organize their students, assignments, and content together. Four of these five specifically mentioned the course management service *Google Meets*, while the Fundesteam educator Alex Caceres stated that PanamaSTEM and Fundesteam use *Microsoft Teams*.

2. Virtual Engagement Tools

Five interviewees stated that they use specific services to engage their students with their content. The most commonly mentioned competitive game tool was *Kahoot*, while the most commonly mentioned virtual laboratory tool was *Lego Mindstorms*.

3. Video Lectures and Visuals

All seven interviewees mention video recording techniques or software to create video lectures, such as using a Document Camera. Four educators specifically employ the video conferencing software *Zoom* for synchronous lectures.

4. Student Self-Teaching Resources

In order to supplement their own content, three educators indicated that they point their students to free virtual learning content sources such as *Khan Academy* and *IXL*. In addition to these services, two educators identified *Teachers pay Teachers* as a resource for lesson plans and worksheets.

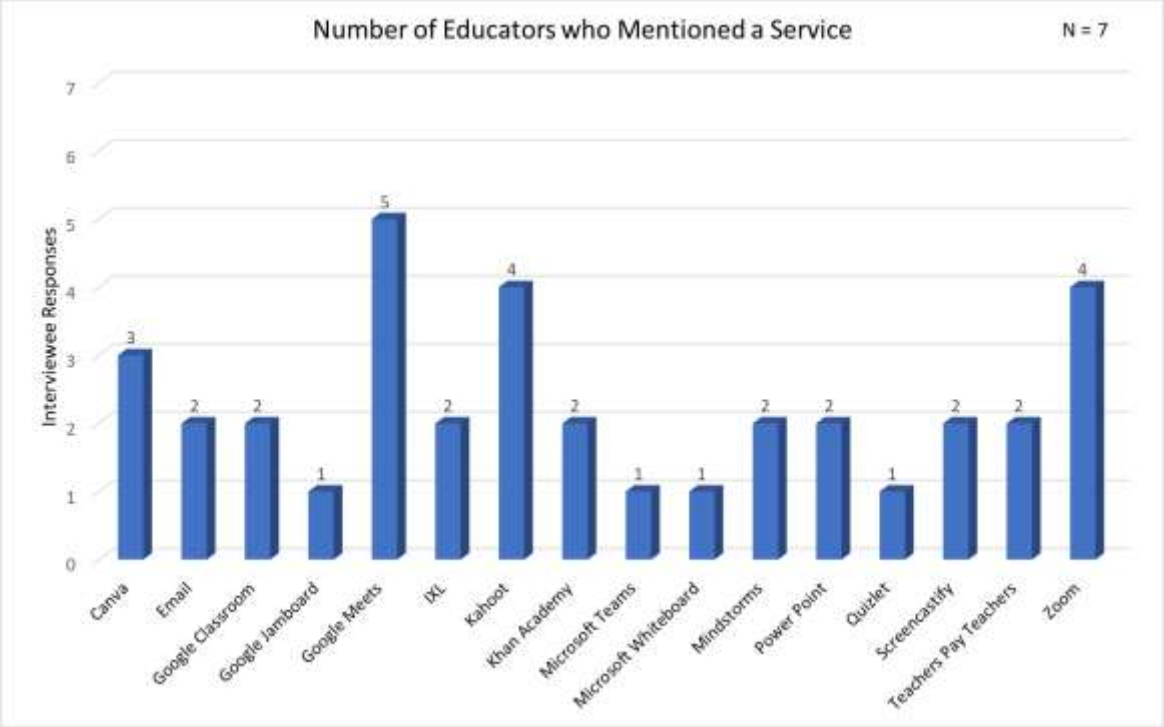

Figure 4.1 - Number of Educators who Mentioned a Service

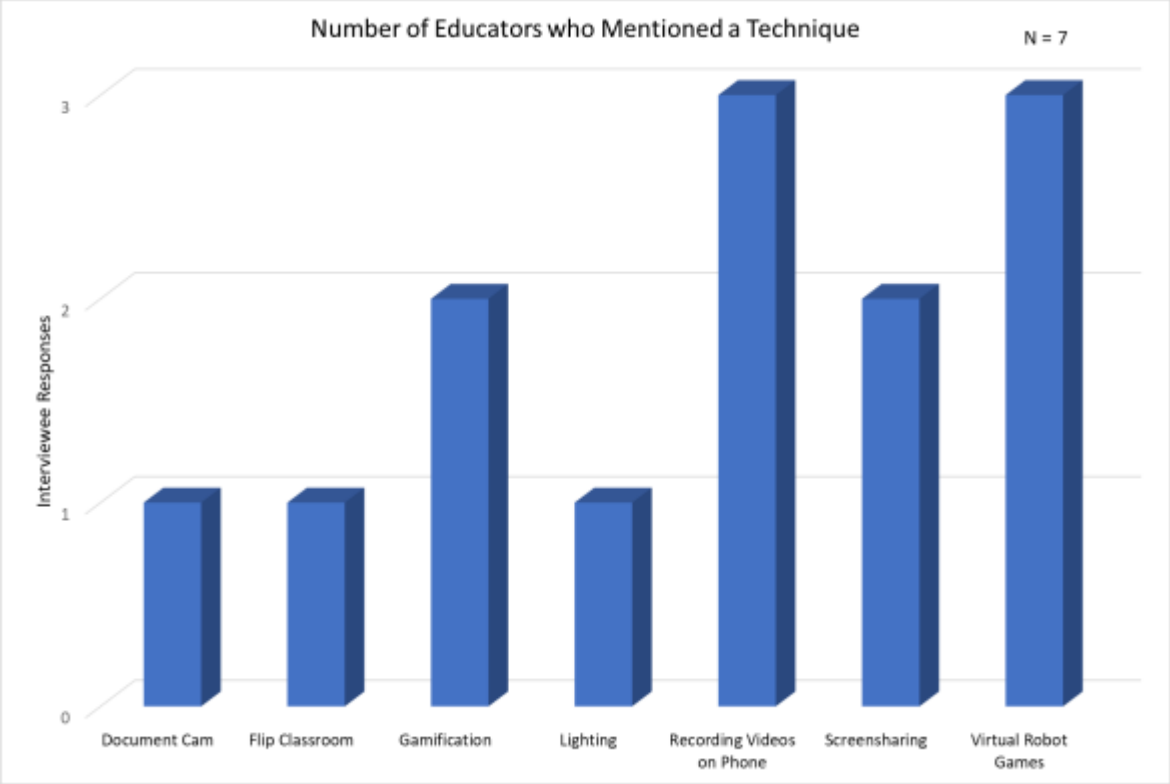

Figure 4.2- Number of Educators who Mentioned a Technique

Issues/Challenges:

Within the Issues/Challenges area (See Appendix J.2), this project team uncovered the following four common teacher concerns. Figure 4.3 summaries the occurrences of specific detailed challenges the interviewees revealed.

1. Maintaining Student Involvement

During the seven interviews, all six of the interviewees who were educators expressed difficulty with maintaining student engagement in class, either due to lack of attendance or minimal involvement with the lecture.

2. Content Creation Time Cost

Three of the educators interviewed had only begun producing virtual education content as a result of the COVID-19 quarantine of 2020 and had little-to-no experience with virtual education beforehand. As a consequence, their learning curve to develop content in this new format was steep and required more work hours from the educator compared to traditional classroom content creation.

3. Student Difficulties Adapting to Virtual Learning

The interviewees noted that their students also had to readjust to virtual learning systems much like teachers. Four of the interviewed educators expressed experiences where their students were unable to adapt to certain virtual learning systems, as well as feeling emotional strain with using these systems.

4. Lack of Technical Resources

Four out of seven interviewees mentioned that their students either did not possess functioning, or had to share, technical devices required to receive learning content from their teacher. These educators noted not having the proper equipment to produce virtual content and having to purchase this equipment themselves. However, that solution is only viable for educators who have the income to use for purchasing this equipment.

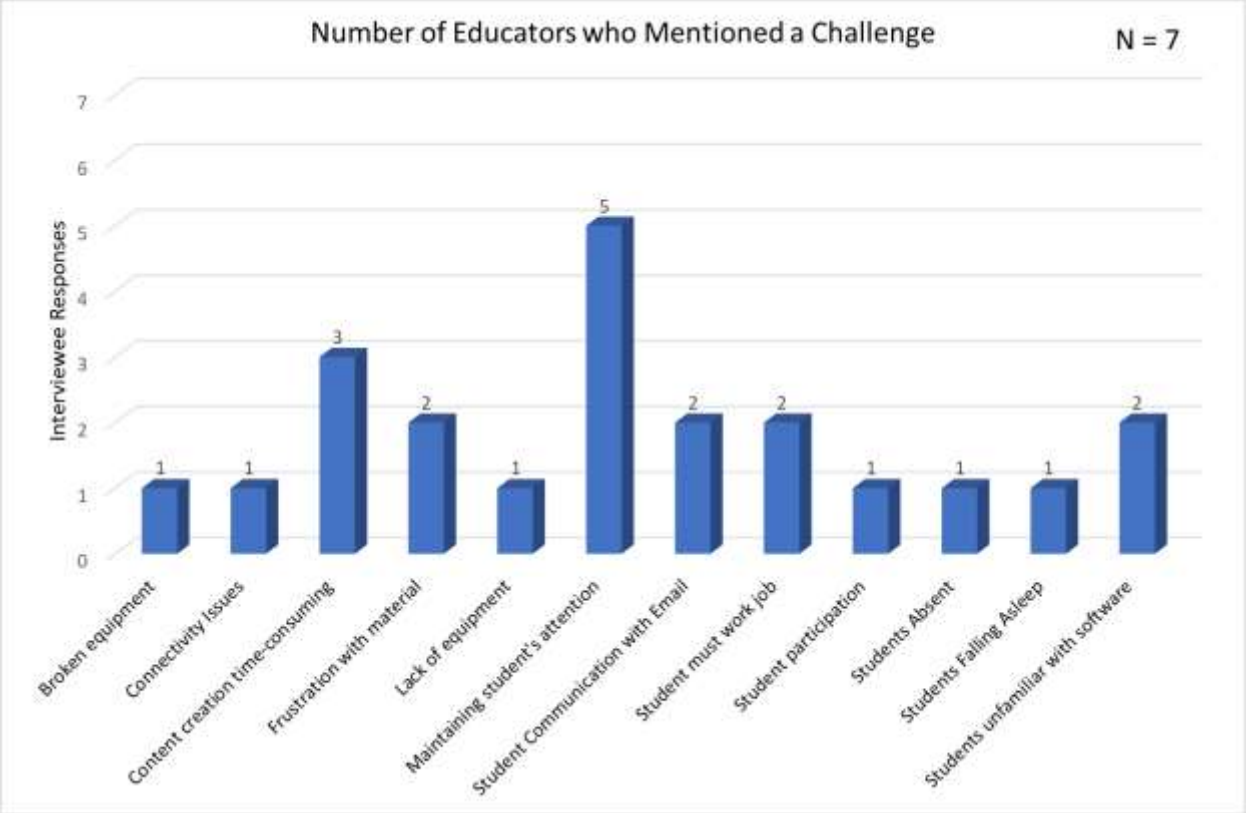

Figure 4.3- Number of Educators who Mentioned a Challenge

Opinions:

Within the Opinions area (See Appendix J.3), each interviewee provided personal assessments which relied heavily on their own individual experiences. Figure 4.4 illustrates trends in their responses. Two educators stated that they were less willing to learn newer technologies for virtual learning because their experience in traditional classroom learning was so well established that they did not want to adapt to virtual learning. The project team asked all interviewees whether or not they believe that virtual learning is as effective as traditional classroom learning. Four out of the seven educators responded “no” and expressed their belief that virtual learning is not as effective as traditional classroom learning. When asked to elaborate on this opinion, three educators stated that the reason for this belief is because of their

observations of their own students. Namely, certain students struggled with the lack of the traditional student-teacher dynamic experienced in traditional classroom settings. As such, these educators believe that their virtual learning systems either need improvements or that less effective learning would be unavoidable for the students.

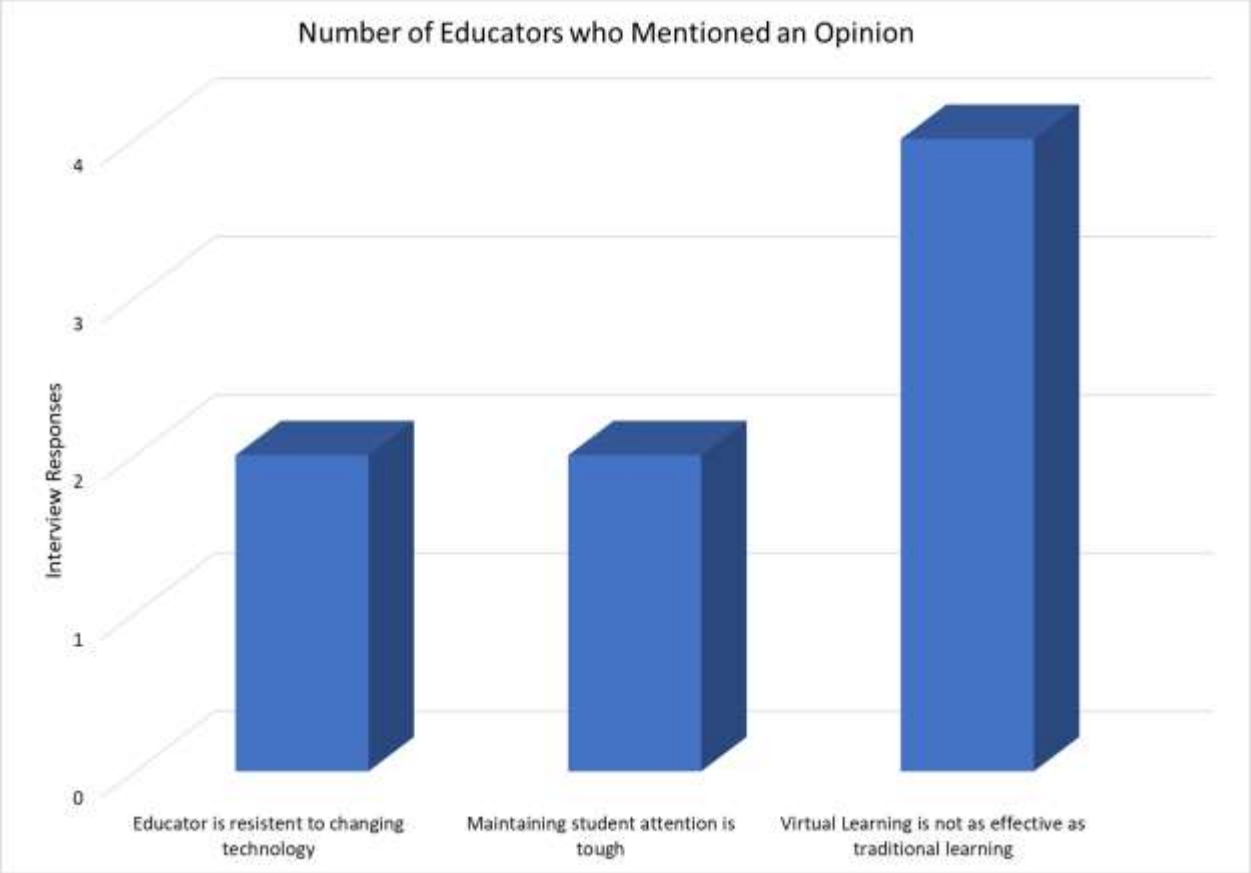

Figure 4.4- Number of Educators who Mentioned an Opinion

4.3 Website Design and Development

Considering the various challenges and the prevailing opinion (expressed in our interviews) of virtual learning being ineffective when compared to traditional learning, the project team prioritized informative content and convenience when designing the website prototype for Fundesteam. The ideal would be a website which serves to mitigate the challenges identified and elevate virtual learning to be a more reliable alternative for educators.

The project team designed the website through *IM Creator's* drag-and-drop interface and the application generated all HTML 5 code we used in the development of the website. Therefore, the *IM Creator* application handled the development of the website and this project team focused entirely on the design.

To design the website, the project team operated under the assumption that approximately 50% of the visitors to the web site will have little to no experience with virtual education or technology, which specifically includes a lack of experience navigating online web pages. This assumption is based on the experiences with learning online education as found in this project's interviews. These novice online users will need extra guidance to build the skills necessary for virtual learning. However, another set of users will likely have more experience with virtual education and would instead prefer to quickly access their desired information and continue making education content. To satisfy both of these user groups, our website navigates users through three webpage groupings. These groups are the Home Page, the Catalogue pages, and the Tutorial and Recommendations pages.

Website: Home Page

The *Home Page* of the website (See Appendix M.1-M.2 and Figure 4.5) begins with a description of the site's objective and features, and a descriptive overview of the purposes of online learning. This information is meant for novice users to obtain cursory information on virtual learning before reading tutorials on how to create their own virtual education content. After this information, the website displays links to our catalogues.

Figure 4.5- Website: Home Page

Website: Catalogues

To organize the available web site resources effectively, the project team classified each of the studied aspects of virtual learning into five separate catalogues. These catalogues are: *Getting Started*, *Equipment Recommendations*, *Software Recommendations*, *Content Creation*, and *Virtual Engagement Tools*. From the links to the homepage, web users can access each catalogue which is on its own separate web page and then navigate to an overview of the functional purpose for each area of virtual learning, and a list of tutorials for services, techniques, and resources within each field. Because a number of the tutorials and recommendations relate to more than one catalogue, the site design includes listing a few tutorials in more than one catalogue. This design decision facilitates more intuitive navigation of the site. For example, if a user would like to learn about how to set up a document camera, they might look in either Equipment Recommendations since a document camera is a piece of equipment, or in Content Creation since the user will record class content with the document camera. In either case, this user can still find their information since both catalogues will point the user to the document camera tutorial.

The Getting Started catalogue (See Appendix M.3) provides more detailed information about the workings of virtual learning, and includes access to tutorials for its basic necessities. On the Getting Started catalogue webpage, the project team placed their created tutorials for course management systems and beginner information for recording lecture videos with a document camera. Additionally, this catalogue contains a tutorial for creating an email account (see Appendix M.8) and explains to the user email's benefits for classroom communication.

The Equipment Recommendations catalogue contains recommendations which advise users on camera and sound equipment, as well as technical specifications for computers. These

recommendations are primarily intended to help educators properly film their content, or maintain a video feed for video conferencing lectures. Considering the challenges faced by both students and teachers with obtaining the proper equipment, the project team created these recommendations to try and let educators work with devices already in their possession.

The Software Recommendations catalogue provides users with advice on services for visual and auditory content production, such as *Canva* and *Teachers Pay Teachers*. From this web page, the user has access to written tutorials for video recording and editing software.

The Content Creation catalogue consists of links to tutorials outlining content creation techniques used by experienced virtual learning educators, as well as overviews of the use of third-party copyrighted content. Included in this catalogue is recommendations for student self-teaching resources such as *Khan Academy* and *IXL*.

The Virtual Engagement Tools catalogue houses recommendations and tutorials for services specifically designed to engage the virtual student directly during synchronous learning. As identified in our interviews, maintaining student attention is one of the largest challenges for virtual educators. Thus, this catalogue houses tutorials on the numerous virtual engagement tools the project team discovered via interviews (i.e. *Kahoot*, and *Quizlet*). Each of these catalogues consists of a web page that organizes and provides access to links to recommendations and tutorials in a list format. Each item of this list contains the name of the tutorial or recommendation as a title and a short paragraph of introductory information about the tutorial or recommendation.

Website: Tutorials and Recommendations

The structure of each text tutorial page (See Appendix M.8) includes an overview of content and a step-by-step process for applying a specific resource or technique to a virtual

learning issue. The project team organized each recommendation page with itemized suggestions that include listed advantages and disadvantages. Both of these pages utilize direct language and assume no previous technological skill level for the user. In addition, these pages contain pictures and infographics (See Figure 4.6) to visually display information. This combination of compartmentalization and clarity is meant to inform the educator on how to produce their content more quickly and efficiently.

Figure 4.6- Email Account Overview

Chapter 5: Conclusion and Future Adaptations

This chapter proposes recommendations for future researchers working with Fundesteam to improve and expand this website prototype.

5.1 Conclusion

The project goal was to collaborate with Fundesteam to design a virtual resource for educators learning how to develop virtual classroom content. To meet the goal, our project team developed five objectives: obtain the perspective of current instructors, identify the current methods of virtual learning and the obstacles, conduct research and investigate the resources available to educators, and develop guidelines and investigate the resource available to educators. The team met all objectives for the project, thus meeting the goal of the project. By obtaining current perspectives of Panamanian educators the team was able to gain important knowledge about the current technological learning situation in Panama. The information gained from these interviews enabled the team to further enable the team to implement a simple user design for the use of Panamanian educators. By identifying the current methods of virtual learning and the obstacles through interviews and archival research, our team collected important information from educators of all different backgrounds and gathered resources to create tutorials to include in our prototype web site. This method proved to be extremely helpful. Gathering knowledge from various other individuals and compiling quantitative data on resources made it possible to determine which items were crucial to cover on our website. The process of continuing research outside of our interview process proved helpful for the team to discover new educational tools that other educators may not possibly be aware of yet. Developing the tutorials for the website resource proved to be the most difficult task for our team. Establishing the

tutorial proved to be more time intensive than originally thought considering the team had to learn each individual software/service while writing a tutorial in a simplistic format that is easy to follow. In the end, our team produced a large number of tutorials and recommendations for any teacher wanting to begin developing online learning content. Although the creation of the written tutorials took longer than expected the team was not able to include the extent of tutorials they originally planned for the project.

Ultimately, the team produced two deliverables for the sponsor Fundesteam and Marvin Castillo: a website with a simple user design complete with recommendations and tutorials for educators and a database of additional tutorials and recommendations (see Appendix L) not directly included in the website at this time. Each of these two components will allow Fundestam to further their outreach of implementing technological learning in Panama. These two deliverables provide Fundesteam with the initial simplistic design of a virtual resource which they can further expand, and the compilation of tutorials and recommendations that services educators can employ to build or enhance their online curricula.

5.2 Future Adaptations

For future adaptations of this project, our team recommends completing new resource tutorials, video tutorials, translating the web page, and adding in a discussion board for educators. With the addition of new resource tutorials, the project can broaden the scope of the resource and benefit more educators. The inclusion of video tutorials will provide teachers with more visuals to further inform the process of creating virtual content. Translation of the website into Spanish will broaden the outreach of educators in Panama who are able to utilize the service and diminish any possible language barriers. Developing a discussion board for the website gives

teachers across the world a communications medium to seek advice and ask questions to other educators about developing their own online learning content.

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Appendices

Appendix A: Interview Questions for Online Learning Educators (Non-Panamanian Based and Panamanian Based)

Informed Consent Considerations:

- Ask open ended questions without leading the question for the interviewee.
- Inform the interviewee of their choice of anonymity.
- If a question generates discomfort for the interviewee, do not pry and move on to the next question.

Introduction:

Hello ____. Hi, we are Nicole Racca and William Aaron, two Worcester Polytechnic Institute (a university in Massachusetts) undergraduate students working with the Fundesteam Corporation in Panama City, Panama for our Inter Qualifying Project! Our project is to create tutorials and resource packages for the creation of virtual learning content, in order to help educators adapt to this new wave of online education.

We would like to interview you about your experiences with online learning. If you don't mind, could we have your permission to record this interview to make sure we capture your responses? If you would prefer to not be recorded, that is perfectly fine and we will take notes instead. Any information you share with us is completely confidential and will only be used for research purposes with your permission. Do you consent to being quoted in our report? We will not identify you by name in any of our writing to preserve the confidentiality of your information. If you prefer to not be quoted, you have the option to remain anonymous. If we ask

a question that you do not want to answer, let us know and we will move on to the next one. If you don't understand our question, let us know and we can try and rephrase the question. This report will be readily available online once we finish writing it, and we can email you the report as well if you wish. Do you have any questions before we begin?

Date/Time: _____

Location: _____

Interviewers: _____

Interviewee: _____

Interviewee Role: _____

Consent Questions:	**Yes**	**No**
Do we have permission to digitally record this interview?		
Would you prefer to remain confidential, or can we use your name in our report?		
Would you like us to share our paper with you once it is completed?		

Interview Questions:	**Response:**
A.1 What is your level of experience with education in general? (i.e how long have you been teaching? Do you have any certification or degree in teaching?)	

A.2 Are you currently running online classes for education, or have run online classes within the last six months?	
A.3 For how long have you been using online education? How long was your most recent time period of online teaching?	
A.4 What age groups did you teach when running online classes, which demographic?	
A.5 What subject or subjects did you teach during this time period?	
A.6 What are some examples of the types of content you have created for this performing online education in this subject? (i.e. live lectures, video's, articles, interactive applications?)	
A.7 Describe your typical "lesson" in this context.	
A.8 What aspects of your online learning content, if any, involved asynchronous learning?	
A.9 What aspects of your online learning content, if any, involved synchronous learning?	

A.10 What is your process to prepare for the creation of your online learning content? How much time does this process take on average?	
A.11 What, if anything, works well with the creation of your online content?	
A.12 What are the resources you commonly employ in order to create this online learning content successfully?	
A.13 What, if anything, are some of the challenges you face when creating online learning content?	
A.14 Can you think of any resources which, if you had access to, would help alleviate some of the challenges with creating online content?	
A.15 How do you communicate with your students? Either/both synchronously or asynchronously?	
A.16 What, if anything, works well with your communication with students?	
A.17 What, if anything, are some of the challenges you face when communicating with students?	

A.18 What is your method to ascertain how much a student has learned?	
A.19 As an educator, do you believe that online education is successful at teaching your students specifically? Do you believe it is successful in general?	

Conclusion:

Thank you so much for taking the time to talk with us today and participating in our research. Is there any subject in the interview which you would like to talk more about? Is there anything else which we haven't talked about yet that you would like to cover? Would you like to review our notes and/or a transcript of this interview? If you have anything more you would like to add, you can reach us at the email address gr-fsteam20@wpi.edu . Thank you for your time.

Appendix B: Specific Questions Organized by Interviewee(s)

Fundesteam Educator Specialized Questions:

B.1 How has Fundesteam adapted their education model for the COVID-19 Pandemic?

B.2 What is Fundesteam's current process for the creation of online learning content?

B.3 What is Fundesteam's current process for the distribution of online learning content?

B.4 What resources are available to you specifically as a Fundesteam educator?

B.5 How does Fundesteam determine which kind of subject or lesson should be covered in their online lessons? (Examples-Teacher decisions or student surveys)

B.6 How is Fundesteams educational content marketed or introduced to students and learning institutions?

Gianna Pecchia Specialized Questions:

B.7 Through what process is your content being distributed to students?

B.8 How do you aid in the day to day learning of your students?

B.9 Describe the typical "lesson" for your students.

B.10 How do you go about helping your students navigate the content and curriculum they are given considering it's asynchronous learning for 24/7/365?

B.11 Do you know of any online resources commonly used by the lessons or the students to learn the content given?

B.12 Can you think of any resources which, if you had access to, would help you help the students that come to you for help?

B.13 Can you describe your typical day as a teacher involved at a virtual school.

B.14 Have you had to adapt your education model for the COVID-19 Pandemic?

B.15 What type of demographic do you normally see participate in Online Learning instead of "traditional" in class methods?

B.16 What resources are available to you specifically as an educator at your respective school?

B.17 How does your school market the non-traditional online learning classrooms to students and parents?

Michael Costello Specialized Interview Questions:

B.18 Through what process is your content being distributed to students?

B.19 What types of equipment do you use when creating your lessons? (i.e. webcam, document cam, microphone, etc.)

B.20 How has Warwick Public Schools adapted their education model for the COVID-19 Pandemic?

B.21 What resources are available to you specifically as a Warwick Public Schools educator?

B.22 How do you determine which kind of subject or lesson should be covered in their online lessons? (Do you continue with the normal lesson plan made for in-person classes?)

B.23 Is there any services or programs that you can think of that you would like to learn, or know more about to enhance your virtual content?

Jennifer Nygren Specialized Interview Questions:

B.24 After going to the Virtual Learning Webinar how do you think the process of creating your content will change?

B.25 What new resources are you hoping to implement into your curriculum?

B.26 Before the Pandemic did you have students working on any projects that involved a higher use of technology (ie. creating videos, presentations)

B.27 What resources are available to you specifically as an OLM educator?

B.28 Are there any resources you would like to learn how to use to enhance your classroom content to further engage your students?

Appendix C: Spanish Translated Interview Questionnaire

Introducción:

Hola, somos Nicole Racca y William Aaron, dos estudiantes de pregrado del Worcester Polytechnic Institute (una universidad en Massachusetts) que trabajan con Fundesteam Corporation en la ciudad de Panamá, Panamá para nuestro Proyecto Inter-Qualifying. Nuestro proyecto es crear tutoriales y paquetes de recursos para la creación de contenido de aprendizaje virtual, con el fin de ayudar a los educadores a adaptarse a esta nueva ola de educación en línea. Nos gustaría entrevistarle sobre sus experiencias con el aprendizaje en línea.

Fecha: _____

Entrevistado: _____

Título profesional: _____

Cualquier información que comparta con nosotros puede ser completamente confidencial y solo se utilizará con fines de investigación con su permiso. No lo identificaremos por su nombre en ninguno de nuestros escritos si no da su consentimiento para ser citado. Si prefiere no cotizar, tiene la opción de permanecer en el anonimato.

Preguntas de consentimiento:	**Si**	**No**
¿Prefiere mantener la confidencialidad o podemos usar su nombre en nuestro informe?		
¿Le gustaría que compartiéramos nuestro trabajo con usted una vez que esté terminado?		

Si le hacemos una pregunta que no desea responder, no dude en omitirla.

Preguntas de entrevista:

Pregunta: ¿Cuál es su nivel de experiencia con la educación en general? (es decir, ¿cuánto tiempo ha estado enseñando? ¿Tiene alguna certificación o título en enseñanza?)

Responder:

Pregunta: ¿Actualmente imparte clases en línea para la educación o ha impartido clases en línea en los últimos seis meses?

Responder:

Pregunta: ¿Durante cuánto tiempo ha estado utilizando la educación en línea? ¿Cuánto duró su período de tiempo más reciente de enseñanza en línea?

Responder:

Pregunta: ¿A través de qué proceso se distribuye su contenido a los estudiantes?

Responder:

Pregunta: ¿Qué grupos de edad enseñó cuando impartía clases en línea, qué grupo demográfico?

Responder:

Pregunta: ¿Qué materia o materias enseñó durante este período de tiempo?

Responder:

Pregunta: ¿Cuáles son algunos ejemplos de los tipos de contenido que ha creado para realizar educación en línea en este tema? (es decir, conferencias en vivo, videos, artículos, aplicaciones interactivas)

Responder:

Pregunta: Describe tu típica "lección" en este contexto.

Responder:

Pregunta: ¿Qué aspectos de su contenido de aprendizaje en línea, si alguno, involucraron el aprendizaje asincrónico?

Responder:

Pregunta: ¿Qué aspectos de su contenido de aprendizaje en línea, si los hay, involucraron el aprendizaje sincrónico?

Responder:

Pregunta: ¿Cuál es su proceso para prepararse para la creación de su contenido de aprendizaje en línea? ¿Cuánto tiempo toma este proceso en promedio?

Responder:

Pregunta: ¿Qué, si hay algo, funciona bien con la creación de su contenido en línea?

Responder:

Pregunta: ¿Cuáles son los recursos que emplea habitualmente para crear este contenido de aprendizaje en línea con éxito?

Responder:

Pregunta: ¿Cuáles son, en todo caso, algunos de los desafíos que enfrenta al crear contenido de aprendizaje en línea?

Responder:

Pregunta: ¿Puede pensar en algún recurso al que, si tuviera acceso, le ayudaría a aliviar algunos de los desafíos de la creación de contenido en línea?

Responder:

Pregunta: ¿Cómo se comunica con sus estudiantes? ¿Cualquiera / ambos de forma sincrónica o asincrónica?

Responder:

Pregunta: ¿Qué, en todo caso, funciona bien con su comunicación con los estudiantes?

Responder:

Pregunta: ¿Cuáles son algunos de los desafíos a los que se enfrenta cuando se comunica con los estudiantes?

Responder:

Pregunta: ¿Cuál es su método para determinar cuánto ha aprendido un estudiante?

Responder:

Pregunta: Como educador, ¿cree que en línea la educación tiene éxito en enseñar a sus estudiantes específicamente? ¿Cree que tiene éxito en general?

Responder:

Conclusión:

Muchas gracias por tomarse el tiempo de enviarnos respuestas y participar en nuestra investigación.

¿Hay algo más de lo que no hayamos hablado todavía que le gustaría cubrir?

Si tiene algo más que le gustaría agregar, puede comunicarse con nosotros en la dirección de correo electrónico gr-fsteam20@wpi.edu. Gracias por tu tiempo.

Appendix D: Alexander Cáceres and Victor Rodiriguez Interview Transcript

Date: 09/02/2020

Will: I really appreciate it on sort of such short notice, it is very much appreciated. For this interview we just want to discuss and talk about your experiences with education with Fundesteam and also what Fundesteam is doing. Basically go over a lot of the interview questions that we sent to you earlier through email. We do however also want to explicitly ask you all if we have your permission to digitally record this interview.?
Alex: Yes
Victor: Yeah sure go ahead
Will: Okay, great! Would you prefer to remain confidential in the information we receive from this interview or is it alright if we could use your name on our report?
Alex: *agrees*
Victor: Um yeah you can use it, that is no problem
Will: Great, thank you!
Alex: That's a good question, thank you for asking! But yeah, go ahead do it!
Victor: Yeah, Yeah
Will: Would you like us to share our paper with you once it is completed so that you can see everything written?
Alex: Yes
Victor: Yes, please
Will: Yeah of course, thank you! Alright, great! Okay, so, let us get started!
Alex: Okay
Victor: Perfect!
Will: So I guess, first things first Nicole and I are rather interested in what both of your levels of experience with education are and how long have y'all been teaching, or your involvement in it?
Victor: Okay, well Alex is the expert in that part, so let me answer first, please
Alex: Go ahead
Victor: Because, okay my experience of teaching with the kids its not longer, its like 6 months intensive with a first year when i entered fundesteam. But I help the team with academy and this morning I help with a class with a school, a private school, using a steam virtual, that is our platform. But I have much experience that I have, Alex, or Alejandra, or our teacher Sonya but I have certification for other elements or other learning management systems for BEA training, its maybe what is edusystems. I have a certification in edusystems for training teachers, and also i have a certification on creating content and like creating courses on moodle. I have other certifications, let me see my linkdin profile, I don't remember. I'm not a teacher 100% but I can teach, my main concern, I teach better with professors not with students. I feel better and more comfortable, with teachers teaching, and teachers teach a professor, not the student. I don't know if it's great, or if that answer works. William, good?
Will: Yeah, so I mean like.

Alex: That work for you, Yeah?
Will: Yeah of course
Alex: Also to, clarify that, Victor is more on, lets say, management team.
Victor: Yeah Yeah
Alex: He works with the overview of the commercial and management decisions. But if we need some math power, to manage a lot of kids Victor also has also he stands on deck and he also, lets say
Victor: William and Nicole and the last certification I have and all the team have, is the diplomatic certificate on STEM-STEAM education, that is a course we take with the
Alex: Universidad Pontifica Boliveriana
Victor: Yeah it is a University Pontificia Bolivariana, it is from Colombia, and also is with the education portal of the americas, that is the uh administration of the americas
Alex: OEA
Victor: That is the company, OEA
Will: OEA, oh yea
Victor: That certification is to everyone on the team, Alex, Neada, Marvin, and Llorena. And we replicate that topics like the structure of steam education, the environment, and like the ecosystem of steam education with all the team. So all the teachers, all the team of the management, have the knowledge about the STEAM education, how to transfer the topics, and how to transfer the tools to the kids, okay. Also we created and we all know the training of the STEAM education to teachers, because there are different kids. I don't know if you need more from me.
Will: So I'm curious, you say the OEA certifications. It sounds if though, these types of certifications are involved in using teaching teachers how to teach, like we are also trying to do. Is that like a correct thing to say, or am I getting the wrong impression about the OEA?
Alex: Ah yeah, I can show the screen to show you what is.
Victor: Please, perfect
Will: Oh, okay, yeah
Alex: Nicole you need to enable the option
Nicole: Absolutely, it should be all set
Alex: Yup, oh yeah, thank you, yeah yeah. Okay, here is the certificate that Victor is talking about *Shows Dipomatura en educacion STEM-STEAM* This is from the OEA, it is an organization of the american states, that's the name.
Victor: Yeah
Alex: And, University
Victor: Pontificia Boliveriana,
Alex: Yeah that does not translate totally and it's just like that. It's like, we'll call it a diplomado in spanish, but it's like a one year intense training for teachers how to train other teachers and do like stem education in general. Its well let's say a one year course in education on STEAM-STEM education for teachers and for students, the one that's shown there on the screen that's

mainly to teach another one of the team of the school let's say the administrator, the management side, teachers, the kids how to create a steam program for all the school and the different types of like development for the program and the different phases. And for that was this program or this certificate that we took from Universidad Pontificia Bolivariana, that's the one that Victor is referring at
Victor: Yeah
Victor: There's a fact in that program that we took we use guidelines from arizona state foundation
Alex: Yeah
Victor: For implementation of STEM education in their schools there's a first step that its introduction step, there's a second step, its extra exploratory step i think, and there's two more steps that an complete immersion of STEM education and we use that guidelines for our programs for implementation of STEAM labs that is laboratories, in the public school we benefit.
Alex:*screenshare* These ones, that's what victor is saying, I don't think that I have the screen right now.
Victor: Yeah
Alex: Do you see like boats or do you see the webpage
Victor: I see like a
Alex: Like a
Will: We see like the screen background, the background of the desktop
Alex: Let me try again, now?
Will: There we are, yeah! Arizona STEM Network
Victor: That one
Alex: This is the one that Victor is talking about, like the different types of leading, teachers and learning, make the budgeting and implementation guide that was like the source of material for the University Pontificia Bolivariana that they make the course with the permission of them and the University of Pontificia Bolivariana give it to us with all the training all the activities and all of that, and how to make the program and for different countries. But yeah this was the source materials, and I will put it in the chat very quickly.
Victor: Yeah perfect
Will: I'm curious to know about whether or not or in this learning of what you did in order to become trained in STEAM-STEM education? Did those teachings ever cover online classes and how to approach education content in that way, or is that something that y'all have had to learn so far due to the COVID-19 pandemic?
Alex: Well I can, I can tell you about that. It is kind of a funny story. From the beginning of PanamaSTEM and Fundesteam. Marvin was saying, hey, we do not have enough manpower to reach the world. At least I use the word "manpower" because we need a lot of hands to teach all the kids. And he said hey, we need some platform, we need something to do it like globally, like a massive, so the kids that cannot attend the center of Fundesteam can attend the classes also. That is well like a dream that he has since the beginning of all of this. Then when we, after we

took this program with the Universidad Pontificia Bolivariana he say, hey, what about if we take all those knowledges that we get and make like a webpage or like a portal with videos of, structured videos, regarding different robotic classes. That is the main idea. Now on the programs they didn't focus on online learning, because there was no pandemic at the time, it was like the beginning of the year. They told us that hey, the future will be going in that direction, which that then gave Marvin the hey, this is the way, so after we're finished that program we started working on the site just to try to learn right away so we're learning at the same time we are producing the videos and testing with the kids that were taking the classes at the moment that hey you like this type of videos, do you like this type of animation, do you like the lighting, the background, all of that, but with the kids out there. For example, with the kids I record myself dancing, just funny dancing, and I will show the kids two videos, like hey, do you want the one stiff teacher who is just like telling you, or do you want the teacher that is dancing and all of that. So, that was like last year, let's say like September/November that we catch onto the idea and know what to do. Then with this pandemic that hit us, lets say at the end of the year/beginning of the year, just by luck, very slim luck, we get the site going with some classes, basic classes for the kids so they can learn some robotics. Um, but no, at the moment, we did not know pandemic was going to hit but we just tried to be beyond the bounds of the situation for example. Yeah and with the pandemic hitting what we need to do as educators instead of giving the kids like a book so they can read, instead of that we were saying hey, if you get the like a license to access STEAM Virtual that will be your Virtual book, and you will have different Videos, different tutorials, different quizzes that you can practice over there, and what we are going to do in the system is that hey that's your book, that's for asking requirements for let's say teaching, "offline teaching" for example I call it that, asynchronous teaching, and we let's say like meet once a week to see how you are doing, if you're not sure on something, if we need to review something, and like that was like the transformation that we needed to do at the beginning of the year. Hope that answered your question.

Will: Yeah.

Alex: That was like the main story

Will: Sorry I am just trying to like make a note, so we can like know where to like check in later. Thank you, um, so, let's see here

Alex: So like, another update, that was like the program from last year to the beginning and that's the program we are working Fundesteam and Panama STEM we're working together on that and it's not like the date passed, I mean that PanamaSTEM is doing the same that is like doing classes for the kids with the paying methods, and Fundesteam was doing an ultra-parallel program so that somebody else, or like a sponsor or somebody else can pay for the kids to attend without they have to pay money for the program so that is the main reason that I told you the story until the beginning of the year

Victor: Yeah

Will: So that's definitely showing change now, sort of as from the beginning of the year due to like the current events as you stated

Nicole: So, I'm just curious with this whole outreach, PanamaSTEM program what's the current demographic that like you are trying to engage, is it all like K-12 or is like you know, 3-6?
Alex: That's a good question, I'll answer that. Before the pandemic we were teaching kids from, let's say 3 years old, up to 17
Victor:2 years old
Alex: 2 years? Oh
Victor: 2 years yeah
Alex: 2 years
Victor: Yeah 2 years up to
Will: 2 years old?!
Alex: eYah, yeah, I remember
VIctor: Yeah Yeah
Alex: There was like a teacher for each groups, age groups. Now with the pandemic..
Victor: We actually have one teacher that is specific to those kids, she have the knowledge to transform them into technology and all the things with the kids of the kindergarten. Go ahead, Alex, sorry.
Alex: Thank you Victor! Also from the pandemic, starting from March up until this moment, let's say today, we're teaching kids, from 6 years, up to 17 or 18.
Will: 6-17
Alex: Like those little guys that have those like that technological let's say ability to manage all the programs and all of that that we need for that classes
Will: So, before pandemic it was i'm assuming it was 3 to 17 years as well and now with pandemic it's 6-17 due to the technological necessity
Alex: Yes
Will: That's still such a crazy thought
Nicole: That's a wide range of kids
Will: Yeah, just the shear range of education covered. I'm curious to know then depending on these, not just demographic of what fundesteam covers, but also the subjects that were taught during these time periods both before pandemic and during. Nicole and I have talked with Marvin about and so far the focus that we know about what Fundesteam has done is primarily in their robotics range. But, sort of expanding upon that, and whether or not that has changed pre-pandemic or post-pandemic, what subjects has Fundesteam been focused on entirely.
Alex: Victor would you like to answer that one?
Victor: Sorry, William can you repeat that, please?
WIll: Yeah, of course, so we're wondering as a comparison with pre-pandemic and post-pandemic, what sort of subjects and content did Fundesteam cover? We have talked with Marvin a bit on their focus in robotics, but we would like to know in generalhow far does that reach extend.

Victor: Okay, yeah, we're actually, after the pandemic or really in the pandemic,during the pandemic we are really only focused on robotics, but we also learn some, specific things about technology, like you know Alex knows like Hour of Code
Alex: I don't know the exact translation, but I know it sort of translates to like Hour of Code, it's like that
Victor: Hour of code, but like there's no course, full of program more like to learn the kid of the logic of the things, like the structure of the algorithm but you know more like the more soft, more easy for the kids, but during the pandemic we are focused more 100% on the robotics.because we have to engage the kids to participate on the 6th edition of the National olympics of robotics STEAM here in Panama so we have to keep teaching robotics here, using our platform. I don't remember the question for before the pandemic, or the content of the question we cover before the pandemic. But before the pandemic we cover all the rest of STEAM, Science, Art, even Mathematics, full mathematics, we cover all the STEAM areas in our classes, in our potential class. But during the pandemic we are focused first on Robotics because we already have the content for our robotics in kind of a virtual mode so it is easy to transfer that content, like that content that Alex has in the computer, or that Alex has in his head. Yeah, and all the teachers. So it is more easy for us to put that content of the robotics programming on our platform, but the vision is, I don't know if you, I'm sure Marvin, show you the platform, let me show something here, that is important. Let me open STEAM Virtual. I'm currently sharing the screen of our platform, that is STEAM virtual. Here, this is ISTEAM+, the thing we going to do is, upload some course about entrepreneurship, Science, Technology, Engineering, Art, Mathematics, that is the STEAM areas, but also we want to create content on Humanities, business, financials, business intelligence, you like that kind of things. And also we want to create a course for the teachers, not for like our trainings, but more like a course, like they can take a course for i don't know like 6 months, or 3 months, or 5 months and they have to, they can em, win a certificate. So if you see this it's more than STEAM areas, we focus on the STEAM areas because we are a STEAM education 100%, but we want to amplify, expand the content with entrepreneur, humanities areas, and course for teachers but these courses are more for a certificate or a diploma like what Alex, and all the team too. It's like a STEM course maybe 2 months, maybe 3 months, maybe 6 months with like the teachers.
Alex: Let me expand on that, just to like make analogy of that, it would be like a type of like a coursera course for teachers, that they can, set up online, it would be like a guide like all of that, let's say like 6 months to one year so they can get a certificate. We are trying to work on a partnership with some university here in Panama so when the teachers get the course and let's say they pull through they get the certificate ballot like one of the courses for the university. That's like our goal. And that's what Victor is trying to expand on that.
Victor: Sorry, Alex yeah. And with that way, WIlliam and Nicole, we already have the like the signature for the university that will like support us through these course, it's called University of the Americas.Let me, let me find the website and I show you, okay? Yeah, so we can maybe the next years start within the next years. We have to work in that course because I don't know if

there is a time in this year, because we have so much work Alex, so I do not know if we have enough time to launch this course this year, but maybe in the next year. We already have the course, well, well, it is just for information, we have the signature and the support with this university. Let me show you.
Alex: You're sharing a screen but you're not sharing the screen, okay yeah you're using the share,
Victor: Yeah, yeah I sent it in the chat, there's the page also. Here's the page. It's this, it's this one. Yeah but William and Nicole for the summary we're focused during pandemic on robotics and programming, because we have to engage the student to participate the virtual games which is the National robotics competition here in Panama.
Alex: Also to expand on that a little bit and also one of the main situations here in Panama is that kids doesn't like math, they, they hate it. They do not really think it is useful. They hate it, also thinking, like logic thinking, they hate it also. And one of the main, one of the key areas that we focus on is robotics because we use the like robotics like a gamification tool so we can teach them math and the logic thinking so that they can solve some problems, that's the main reason that the website says AVP that we would translate to project based learning, that would be the translation to that. And what Victor was saying would be at the end of the year, like you would have in the US like FLL or First Lego League, or First challenge, all of that, also there's a parallel of that with world robotic league. But with the pandemic, all of those programs were like closed, so we want the kids to have like the opportunity to participate in one of those competitions, like robot virtual games which is the website where the kids can participate in a competition made for let's say, here in Panama, for all the work, and one of the objective is hey, we're going to teach you how to logic thinking, math, how to apply the math so you can participate in one of those challenges on the robot virtual games website and you can see how many point you get and how many times you get, and what you can do to optimize your software and what you can do to your robot to be more fast or more stable, what that type of thinking and what we focus on right now with the kids.
Will: I see, I see, so lyou've essentially created your own world robotics olympics so you can have
Alex: I mean we do not create it, but like
Will: Okay
Alex: It is like a pitched idea, and say hey, we don't have the knowledge rn on how to build it, but we can build the partnership with someone if you put the technological advantage, we know, we put the know how with the Panama's inclined to know that and offer other different things and we do a partnership with different companies around the world and around latin america and we build together the website called robot virtual games. So another countries can also take advantage of that to, so like they can say hey, that's a motivational tool, let's go that way, but yeah/ Yeah, i think, I know it's a lot.
Nicole: So with this platform you guys have created, you guys aren't really participating in any synchronous learning, is that what I'm getting here? Okay.

Alex: Actually, yeah, we are doing it! That's the situation
Victor: Yeah
Alex: And before this meeting we were in class
Nicole: Oh
Will: You were in a synchronous class?
Victor: Yeah
Alex: Yes, we are working with different schools in Panama that we tell them hey, we want to offer the robotics class but instead of giving you like a physical book we can give you the access to the webpage STEAM Virtual. And some schools say yeah, that's wonderful, let's go ahead, and then the pandemic hit, and that's what the main reason was that, hey it works. Because of the way we meet up with the kids once a week and say hey this is our synchronous class, we meet once a week, and we say hey you need to see these videos, answer this questions, do this homework, and then at the next class next week we will go over it and go to different content. And we will go over what goes wrong, what goes right, it's working, you're getting some sort of error and we're doing that way. Some schools have been like hey,
Nicole: So it is kind of like a hybrid mix, as in like they do have you know asynchronous lessons but once a week you guys meet virtually to kind of
Alex: Yeah
Victor: Yeah, yeah, actually Nicole, sorry Alex, the thing is, the platform has so many course, so the kids, the thing is it's like okay im a kid, I'm a student, im logging into the platform, i see so many course, maybe a new course from biton or for java, oh I like java, I'm going to go to this teacher and enroll in this course. That being said it's more so it's like self learning, it's more for that style because the synchronous class is more for help, more for support, not for teaching, well yes teaching, but really support, technical support, academic support and for the transfer comfortable, or making the kid comfortable with the platform. That is for the synchronous learning
Alex: Also that we're trying to say like, to accomplish here in Panama is to make a flip classroom, so they can learn before we go to the class. We're trying to accomplish that in Panama, but that type of learning goes against the traditions in educations, so we do not call them flip classrooms but essentially that is what it is. We're trying to do that and another way, and not saying that these are flip classrooms, but just to say to the kids hey, you know how to follow this this this this and then the class we are going to review it and then give you support. That is what we are trying to accomplish with them.
Will: In accomplishing this, or doing this sort of goal of a flip classroom would then like the resources that the student uses to learn before hand and then come to class later and act it out would those resources be sort of the same or similar ones that they are currently already being used for online learning lessons, like are there video lectures, or virtual robotics creations
Alex: Let me expand on that. Yes, for example here in Panama one of the most popular tools for synchronous education is microsoft teams, some schools use zoom but right now the majority of it are using microsoft teams. So we tell the parents hey, also additional if you buy the license for

the access to STEAM virtual additional you will get the robotics lab, which is called virtual robotics toolkit that's the program that is the simulation of the robots. Additional for that is the lego mindstorms to program the robot and another program called Lego Digital designer to design the robots and all of that. So, it is like a package and we told them hey you don't need to buy a new computer or any of that but just have access to the site and install these programs and you're ready to go. Have a good mic, and have like headphones and you're ready to go
Will: So it is very available then if it's just like as long as any previous equipment they need to use is on the website
Nicole: So it is kind of like a paid package for the parents who can invest into STEAM education for their children or do you also have free options for those who cannot.
Alex: Yeah that's the main reason why I tell you the story until the beginning of the year. That story changed a little bit.
Nicole: Okay
Alex: At the beginning of the year before the pandemic hit, let's say March when schools were about to begin, we pitched the idea to schools like hey we have a platform you can use with your equipment instead of buying like 40 dollars of physical book, you can buy the package with the website and softwares and all of that. Just install it and you are ready to go. And some schools say hey, yes, we're going with that all the parents buy the license and all the package and that's we're the synchronous classes and the asynchronous classes come in. Let's say that's the PanamaSTEM main way. That's where Fundesteam comes in and do something different. Some parents say, I lost my job I do not have the money to pay and all of that and Fundesteam also and Marvin say let's offer this program to all the kids in Panama. And that's where Fundesteam searches for sponsors outside of Panama and in Panama to create like a program for 1 or 2 months for free teaching for the kids so they can have the website for free and they can have the softwares for free and for once a week on Saturdays we were meeting with the kids so they can get knowledge on robotics and all of that. And yeah that was like for 2 or 4 programs prior to that, also after that when we finished the free classes for the kids, the Panama government say that program work, but let's do the same for teachers. Let's teach the teachers how to use the digital tools so they can teach the kids, how they can use robotics, how they can use microsoft teams, or google classroom/meets etc. How to do that, we were working on that till about 2 months ago.
Victor: There's, sorry Alex, just a few things, and there's a fact, we teach the teachers of the nucleus of environmental learning, environmental virtual learning I think Eva, how do you translate Eva Alex to like virtual learning environmental.
Alex: Elements
Victor: Elements yeah under our management system and this training for more extend just for our platform, we teach they how to use microsoft teams just like alex say, our google classroom also Lapster or our other platform for science and edusystem and STEAM Virtual. So the thing that this training is to the, it's the teacher feel more comfortable teaching virtual classes for the kids, or taking virtual classes for the students, it's not just for our vision of our robotics of the

STEAM education, it's just for help the country or all the countries feel more comfortable in this situation during the pandemic. To feel more comfortable the kids during environmental virtual learning, virtual elements. Go ahead Alex.
Alex: Yeah, Yeah, Yeah, go ahead guys, do you have another question?
Nicole: So, I don't mean to the conversation in a completely different direction, but I am just looking for clarification, I've noticed through our own research as well PanamaSTEM and Fundestem are two different organizations, kind of completing the same thing and they have similar people working for them, but can you just clarify if PanamaSTEM is just for teaching the kids and Fundesteam is kind of funding for it?
Alex: Yeah, sure we can explain that, very quick. PanamaSTEM is a business company any other company, let me close the door, okay, Fundesteam is like a non-profit, non-government organization that wants to give the kids the, for example the first goal is for the Panamanian kids to get the opportunity to get the first-world education, so we can upgrade the education. And so that the teachers have the tools and the kids have the tools. So they are 2 separate entities, and what we do for example, Victor and I and the team. We finish our work shift for example, 2 pm 3pm etc. and we start working on Fundesteam things. That is Voluntary work, that's the main reason why we say we are teaching some classes on Saturdays because normal classes are on weekdays. That's the main reason why I make that observation. Oh yeah, that's a good question Nicole, and that's a common one. It is a little bit confusing, but yeah that's a good question.
Victor: There is two different entities, PanamaSTEM has their own project and Fundesteam has all their own projects. In some projects sometimes both organizations have the same vision, like you know like uh STEM implementation, education, STEAM education around the all of Panama. So in some projects there are fragments where both organizations can work together to achieve the goal in that project. So PanamaSTEM support Fundesteam mostly on the national robotic olympiad here in Panama. PanamaSTEM supporting the class of the training of the kid of the training of teachers, or maybe even on the under a human resource. All if the employee of PanamaSTEM have become volunteer of the national robotic olympiad, Fundesteam needs hands, and Fundestem is only Marvin and Valeria, so it's just 2 person in Fundesteam. So the agreement of the company and both organizations it's for that, it is for support, technical support, academic support in the development of the projects. I think I have that agreement, maybe I can send you, to William and Nicole to look at the agreement so you can understand more of why, how Fundesteam, how PanamaSTEM support Fundesteam in their projects. Because Fundesteam do not support PanamaSTEM. PanamaSTEM support Fundesteam in their projects.
Alex: Yeah also regarding the on that, for example, Fundesteam also tried to make the logistic for hey, we are going to offer like a program for the kids. They tell the government hey we're going to launch this program for the kids, but we need to manage the logistics on how to get the volunteers someone of that knowledge can then attend the kids and all of that, one of the grimace that we get here at PanamaSTEM is we have to do some amount of hours, voluntary hours on any non-government organization, it's like a traditions here, and we use Fundesteam.

Victor: I think the hours of the volunteers is in all of the organizations here in Panama. All of the organizations here in Panama all the employees of the organization has to complete a certain amount of hours of volunteer work. In any org, or any non-profit organization. So PanamaSTEM support in that part, also in that part to Fundesteam. It is like the channel of the social responsibility corporate, cooperative of Fundesteam.
Will: Let's see, okay, so Victor, Alex, I do have to leave in order to fulfill in for a campus job but I do want to express, personally my thanks for coming on with this interview, and I will leave you all both in Nicole's very capable hands. Thank you at least on my end, for coming and doing this.
Victor: Thank you, Thank you William, very much!
Alex: Thank you William, good luck with the kid, have a lot of patience.
Will: I will, I will. Thank you so much
Victor: Good luck
Nicole: So I personally am just curious, with all of this, especially with this, stating how Fundesteam reaches out to the government and then says like, oh we have this program that we want to accomplish, like, how does Fundesteam kind of promote, do you know by any chance, how Fundesteam kind of promotes their educational content to schools, students, teachers, and things like that? Or if you don't feel free to say so
Alex: Victor can tell you more about it
Victor: Alright, let me, if I understand, how to promote STEAM education in the schools?
Alex: What she is saying is that, um,
Victor: How to reach the sponsors?
Alex: how we get the programs in the schools, I tell the government because Panama is too very little, but that is the main reason why I tell the government but it is actually the locals of the authorities, and we say hey, we are going to open the program
Victor: It's like how we are going to reach the sponsor in Panama, look there is so many steps, it is a cause for reach a sponsor in Panama. I think it's a bureaucracy, but the first thing is do a presentation for the program to the bureaucracy, it has to be a presentation for a specific project presentation in Panama. After that if we have good answer for the sponsor, we have to build, agreements, we have to build, we have to, that agreement have to be the signature of the director of the authority of that entity. So after that signature, the file goes to uh, controleria, there's an entity with a contu validity of the country like the
Alex: Budgeting
Victor: Yeah, the budget authority here in Panama after that the director of the entity has the refrendo, idk how to say the refrendo, yeah the proofman. So we can reach the funds for that entity of the government. Yeah but after, before that many things happen to structure the program with the hours, structure the content with the hours of kids, establish the age of group of every classroom, and yeah
Alex: Also adding to that, then we get the signing on all of this management process, we ask hey, did you agree that we do some like advertisement for the program, if they say yes you can

do it before we get the signing or they can say no, let's finish let's get the signing, all the signing, and let's get the proper paper work, and then let's go the advertisement. When we finish all that process usually they tell hey, yes, let's go ahead with the advertisement, and that is when we go on instagram, that is one to the most popular here in Panama. Doing hey, we're going to offer a program via Zoom or via Teams etc. and we are going to use this type of software and its going to be free etc. or this program is just for kids from this school, but usually that is the way.
Victor: Also we select the schools as a part of that. Yeah, it's most like this, actually it's like this, and we have to do a good presentation for a specific project and we uh, have a good meeting with the sponsor or the possible sponsor for the project. Yeah there's a fact here in Panama and also in any country, you have to be a legal status active, all the legal papers have to be on the date, for the sponsorship. For example we have an agreement with the administer of litigation with an agreement of to enter, of the all schools here in Panama to teach the kids, to teach the teachers. So, this achievement for us when we do our presentation from the sponsor, it also has some benefits for the DEA (ISR for the US). We also have a benefit with the author entity on the minister of the social resource, the social developments sorry. You have to built the entire ecosystem to be able to teach in Panama. Without the consistent you maybe have more opportunities to reach the possible sponsorship. But yeah, it is hard, it mostly here during the Pandemic, the economy here in Panama during the pandemic is very very bad. So I don't know if that answers your question
Nicole: Yeah, so even with people, like PanamaSTEM, the organization, you don't directly reach out to the school and say like Hey, we're offering this program, do you
Alex: Yeah, let me explain, that's a good good good question, yeah. We try to avoid going directly to the schools, we are trying to avoid doing that. What we are trying to do is participate in different grants around the world, for example, the boeing, I mean Victor you can tell more on that.
Victor: Yeah, yeah parts the Boeing, with the Pan-American, also we participate in the US embassy programs on grants here in Panama, we participate in the motorola grant program, on the sysco grant program, on the coca cola company program. I think international sponsorships is more benefits and more beneficial to reach the kids here in Panama. But obviously you have to reach, you have to have some connections here in Panama because the coca cola company, or some big organization just in the name, to have ong, just a simple ong. The Ong has to be some connection, a small connection to a government entity in the country, because its a 200k 300k 100k for that times, that type on nation we have to be a relationship with the entity of the state of Panama. We have to add it to the minister of education, to the minister of social development, I think the minister of the President, The minister, it's not the minister, it is more like the office of the first lady
Alex: Yeah its like, I don't know how to call it yeah, the office of the first lady, for other things that are not important for organization the country
Victor: With this help, organizations, we can at least schedule a presentation with the sponsorships here in Panama. We'll say like hey the minister of education meets with us, and

also the office of the first lady, is with us. For example, we win a grant for the company it's called minera Panama, you know Nicole minera Panama it's for the, how do you say minera, minerar

Alex: Mining

Victor: Like a mine in Panama, so that sponsorship will run for behind them, one year ago. And today, the last week, he said, yeah I'm in, I'm going to donate a grant for Fundesteam for the project. But it's for the thing with the minister of education and the office of the first lady. This ecosystem it's more it's very important to reach the sponsorship even the private sector and the public sector. Also we have to show them, we have to show them, the number, like the statistics of the attendance of the robotic olympiad, we have to show them the teachers we are training, the students we impact, the numbers of the STEAM laboratories in their school.

Alex: Also Nicole, we did not choose the school that, mainly the sponsor said hey we want to, we want to help five or two schools on this specific area of Panama. Usually they say that, that's the majority of time. Another time they say hey, we're going to do a sponsorship for one school and this will be the school, or you choose the school, and any of that. But usually this type of organization say, they want 6 or 2 or 4 schools and this is the budget for all the implementations and go ahead and execute the program. That's mainly for that, we did not go directly to the school, we go directly to the sponsor and do all the work, mainly Victor do all that work. And that the heavy lifting and that when all the paperwork is done, then all the teachers will say that hey we are from Fundesteam we are going to teach you this this this and we will give you all the tools, that's mainly

Nicole: Now after seeing all these numbers over the past you know year, few years that you guys have been doing this have you seen a rise in your numbers or success throughout the learning through K-12, or 3-17 of like kids picking up the STEAM learning and continuing on, or do you have any numbers where oh this amount of kids who returned for another year of learning or anything like that. Like kind of see a success rate.

Victor: Yeah I think I have some maybe Alex have some more but, for example, for the national robotics olympiad here in Panama every year has a rise of 20% of the participants and the public general, general public. That's an achievement on our participants, and even the national robotic olympiad. For other side, the last year, Alex correct me if I am wrong, last year we had 3 students with the scholarship from the institute nacional, there's a public school that will benefit from a sponsorship and the 3 kids participate in the national robotic olympiad of 2018. The last year, yeah, that, yeah, this one.*Alex Screen Sharing* So these kids in 2019 win the olympiad and they 2020 in the beginning of this year, there's an entity here in Panama that is called IFARU, Alex if you can put the website of IFARU please, and then this entity is called IFARHU gave to the scholarship, a full scholarship for study in the Madrid University, or some university in Madrid Spain for study in any career in the way of the engineer, maybe mechanical engineer, software engineer, kinda whatever they like. But there's a full scholarship or these 3 kids or all the group, like 8 kids, but 3 of those kids it's training for Alex, by Alex. Like Marissa and other students here in the scholarship in Fundesteam.

Alex: Let me explain that very quickly, before you go off Victor, it's that at the beginning of 2018 for these guys, one of the sponsorship say we want to do robotics on that school, cuidad nacional, it happens to be I was the trainer assigned at the beginning of that year to teach robotics to the teachers and the students at the same time. And after that I was not there, I was just working and when they go to participate on the competition, they happen to win the first place, that's to clarify that. It happens to be, I was the teacher that was with them at the moment of the training and then I was there at the beginning of the year. And this was like in December, actually no it was like in September and yeah they won the first place in that competition. Yeah go ahead Victor

Victor: Yeah, yeah, what, for the event they IFARHU, this entity give the full scholarship to a study of the some career for engineering in Spain, for full scholarship, and well like Alex said, that's students it's training took class in our center Fundesteam. And this is a achievement because it's the team we want to reach, all our students that, you know like training or, in areas of the future. You know. And when the three kids come back to Panama they're going to develop the country you know, develop the country.

Nicole: That's really good

Alex: Yeah also that was one of the years that we like implement more programs that never before at the beginning of the year, and here on the screen we have this little report from 2015-2018 that shows that from 2015 we had like 150 participants and in 2018 that we like implement with Fundesteam this type of programs more kids were interested in robotics that never before. So this was like a big achievement for us and happens to be from institute nacional, and well this was also the viewers, usually they go to football, shows, baseball games, and to all of that but that year specific we got a lot of people going to watch the robotics competition.

Nicole: That's really cool

Alex: Yeah, that's one of the achievements on that.

Nicole: So I think I just have a few more questions, and it kind of goes back to your specific styles of teaching, and how you create anything. Is there anyway you could just fill me in on the process in which you go through when you have to create these courses on the platform, and how you work through that.

Alex: Yeah we have a system before and after, before we have pandemic it was right on the spot, when I mean right on the spot it was like I'm with the kids in the classrooms and say hey what do you like and you opinions that we put this on the website, and they say hey I like this part but I don't like that part. It was on the spot and I was taking notes. And I try my best to record the next class I show to the kids, that was the before. The after the pandemic that I don't have the kids with me and I don't and there with all the kids and do all the teamwork, and right now what we do is we focus on hey, we're going to do a main course that is for example like 8 hours or 5 hours or 16 hours long, and we're going to break it out into 8 lessons, okay. And we're going to say hey each lesson if for example 1 hr or 2 hrs, those lessons have little topics, like videos and we say hey when one 1 lesson, we're gonna say for example, teach 5 topics that will be introduction, the beginners teachings, the very hard challenge, another challenge more advanced

but more short, and the conclusion for all of that, and that's the system that we are doing right now. And that is the main structure and we repeat that main structure all the way along that main course. For example, we are trying to teach the teachers how to use one of the platforms called edusystem, that Victor can tell you more about that, to tell the teachers hey, if you want to let's say teach the kids one topic, you do not have to develop all of the material but you can use this platform of this one or this one to get the raw material, inspiration or source material with the presentations and then if you want to get all of the exams and quizzes you can use this one this one and this one. When we try to make a course we try to make or best to take like, if we are the teachers in that position what we can do. We use the same structure like hey the beginning of this topic on this lesson we are going to say this this and this, topic 1 the raw material, what the raw material, what you need the sources, topic 2 you can use this one this one this one, topic 3 let's make a practice, and we follow that structure for the courses. But yeah that's our main structure right now with the pandemic. Sometimes, very little, sometimes, we're with the kids online and we try to pitch them some ideas so if they like it or like this, and all that. But we always follow that structure that we got a lesson and we have like 5 or 8 topics on each lesson and also with each topic a different questions, a practice questions or quizzes so we can use it with the kids.
Nicole: So, going off that, is there any possible resources if you can think about any of that, that would help you kind of create your content more easily if you had the access to it, or is the anything that could help make the process maybe a little bit more
Alex: To tell you the truth, any help is wonderful on the creative process, it is a chaotic process, let me tell you it is a chaotic one. But yes, if there is some type of like sort or reading material or video guideline that will help us or teachers in Panama how to create content. For example, here in Panama we have like a common situation that we get the guide that have all the knowledge but it does not have the skills to be on screen, but we get the guide that have, I don't know, but it has the appearance to be on screen but does not have the knowledge, but we have another guide that knows like the lighting and all of that. If we get a guide for the teachers here in Panama that puts all of that together on a friendly manner it would be wonderful. For us in PanamaSTEM it was like right on the spot, be learning all the way through and we are not experts on the material, we are trying to do our bests, researching on youtube and on other things on how to use the lighting and all of that. For example this one I just discovered today, that hey, if I have a lamp on my face it is better, instead of having that light over there. I discovered that one today when I was doing the classes with the kids before this one. And also the mic and all of that.
Victor: I have a question Nicole, you and William and want credentials for the STEAM Virtual
Nicole: Yes Marvin, was discussing with us there was possibly a way that we could get access to the platform
Alex: Yes yes
Victor: Sorry Sorry I did not hear it, sorry, okay perfect.
Alex: Victor I am working on that to create the credentials for them with the same email from the university from college, but it is not ready yet, I am finishing some task before I create the credentials on STEAM Virtual

Victor: Okay, perfect
Nicole: That would be a huge help to both of us, I really appreciate that
Alex: For sure
Nicole: Between your asynchronous and synchronous lessons have you noticed any challenges that you have faced when trying to communicate with the students?
Victor: Oh yeah, Alex go right ahead
Alex: One of the main challenges they do not have microphones, they have the better headset but they do not have the mic, or the mic is working, but the hearing doesn't working. Another one is that some schools have the policy that say the kids need to turn on the webcam, that's one of the school's policies, and some on the schools say that no it does not matter, they do not need to turn it on. One of the challenges that we have, is that, a technological one, is that one of the schools that we're working with they say hey, the kids needs to turn on the camera to be more presential, or synchronous but they don't have one and that's a recurringissue, but we tell the school, hey this guy doesn't have like a webcam, if you can provide him like a webcam that would be wonderful. Another one is that they fall asleep, class is at 7:30am it is a little bit hard for kids, so some of them doesn't show. Also one of the kids for example, at one of the schools say that hey my parent does not have a job, I do not have a computer, I can attend via cellphone or all that, and that's another of the issues that we have, that in not through PanamaSTEM but through Fundesteam. We tell Marvin that hey we have this situation with this school can we get a sponsor for this school, for this computer so he can give the school 2 or 3 computers so he can give it to the kids. Another one of them is that their kids, so they do not know how to use Microsoft Teams, but they know how to use Discord, Twitch, LOL, and they know how to game, but they do not know how to participate on microsoft teams for the classes. That's for the technological side, for the medical side, one of the policies that we get from all the schools that we are teaching is that we are doing our best to record the classes because here in Panama we have a quarantine that nobody can go out, and some students get sick and they need to be rushed to the hospital or medical facility and they cannot attend classes. That's another of the issues that we present, for example we have one kid from 9th grade that, always when we have class, she is always in the clinic, I don't know why, doesn't matter but that's fishy. But I was talking with her parents, I think yesterday and she told me hey, I have this situation like that but we are attending the class synchronous, we are watching the recordings, and we say hey there's no problem for that. But this is like the 2 main issues that we get with the kids.
Victor: Yeah
Nicole: Okay, Do you guys have any questions for us, about how we are going to go about putting together this guide for teachers?
Alex: Yes I have a question, go ahead Victor
Victor: Sorry, sorry Alex. It is just on the last you say. There's a fact in every school that use the platform that use the STEAM Virtual or any platform, that the teacher has many many work so when we deliver the platform for the students and for the school, the teacher say to us have much work, I do not want more. I do not want other job. I have much work, I don't have time to think

about your platform or about your scores or about your, because we understand but you know some teachers are more

Alex: Willing to

Victor: Specific, exactly, yeah thank you alex, and other teachers really have so much work so, the thing is that the platform we want not involve 100% the teacher, but they have to be a way to simplify the use of the platform for the teacher so they see the notes and the grades of the student. There have to be a way and we don't know that way right now, because the teacher explode their head when we introduce the platform to the teacher, student, and all the school. So this is of the think have thinking for to create a repository for the facts and frequently asked questions, and also to create a guide for the teachers. For maybe some videos, maybe a pdf I don't know. But we are in the key time for this because the teachers, there's a problem right now with the teachers, because they doesn't feel comfortable with the platform. The thing is not that the platform is bad, it is more because they have so much work. So if you have to train the teacher for I don't know 2 days, each day 8 hours, there is a follow-up. You know it's more work, it's more things to learn and then the teachers get frustrated because they don't understand the platform, they do not see the grades of the student in the robotics signature. So there has to be a way, so Nicole it is just for a compliment, just say Alex

Alex: Also, regarding that Nicole, and this is a common situation here in Panama, most of the teachers, the big group of it are not millennials, you know the other generation that was before them

Victor: Like 60 years old

Alex: Yeah, I don't know how to call it, but they're not too tech primy or tech savvy, and when we tell them hey we're going to teach a new class but there is no book, but you're book is a website. They go wait wait wait what's going on something change here, I do not know how to use it and they do not feel comfortable. And they do not feel in control, its, they don't feel in control of that because the kids are scared of books but they are not scared of websites, and one of the situations that also happens is we got like a senior teacher and we tell them hey we're kids and we're going to teach you how to teach robotics to the kids, and we've got this situation where I've got all this college degrees and I know robotics but that's one of the common situations that we get that they're trying their best on their way to know the platform but the main challenge is that, how to be up to speed technologically and all the ability to be tech savvy as the kids and that is a difficult task for them. It is a huge monumental task for them, because they start talking about all the spec of the computer and the game and all the blah blah blah and they get lost. And they do not feel like they're secure about it. The kids love the platform because it is their nature, but the teachers are not comfortable because it is not their nature, and we are trying to change that, and that's one of the also main situations, but with the teachers, not with the students.

Victor: And it's in every platform, not just for robotics or for programming, its for any platform, even the spanish or science even the art and music, it is every platform because like Alex say it is

not the nature of the teacher, they have a scare, I don't know if it is a scare, or if they do not feel comfortable but it does not work
Nicole: Makes sense
Victor: Okay, yeah Alex continue with the question
Alex: Yeah I've got a question for you, Nicole. Did you know how to use Moodle?
Nicole: Um, Can you say that again?
Alex: STEAM Virtual like the core of STEAM Virtual, it's Moodle, it's Moodle, M-o-o-d-l-e, Moodle. It's like the core of the webpage, what I am asking is did you know how to use it, or did you use it beforehand.
Nicole: I actually just heard of this platform since we have been in contact with Marvin, he has shown us the platform before, and it looks fairly similar to a type of platform that I have used in the past, you might be aware of Khan Academy. It has that similar aspect to it
Alex: Okay
Victor: Yeah Yeah
Nicole: So like I have used that in the past, so I have a basic understanding, I have not specifically used this platform but yeah
Alex: Oh wonderful. This is not like a question but to what I am understanding that is your project, to see if I am on the same line. What I am understanding is that you and WIlliam will create like a course for the teachers on STEAM Virtual, that will tell them hey if you want to do line online classes you need to follow this, this this, this, that is what I am understanding. Is that the main idea
Nicole: So, what is our current understanding we are also supposed to be having a meeting in the next few days to also clarify some things but when we met with him last we discussed kind of making a website that's going to include guidelines, recommendations, and tutorials on how to use you know the equipment, the software, and other recommendations that not only you guys have in the manual that you guys have recently created for online learning but also extra recommendations that we also have and know of and also are you know researching as we go through out this project. And it looks like Marvin eventually wants to make that a course for teachers itself, but we will be building that first stepping stone, which is what we have a current understanding of. That might have recently changed but I do not know
Alex: Yeah yeah yeah, it's like just for a first step but if you have a website with all of that content that would be awesome and wonderful. And I think that will be a course for the teachers, but yeah that would be awesome. But yeah that was what one of my questions was regarding that. But also, if on the website that you created, if you can make or place like a quizzes. Like a I don't know how to call it, pop quizzes for the teachers. For Example if you teach them how to use the lighting on the camera, so they can have a measurement if they know or if they doesn't know about it. If you could include that on your webpage, it will be wonderful, because we can measure and you can measure hey this person watched this video and he tried to answer it but he failed and he do it again and now okay, now he gets But yeah, if you can add that to your webpage that would be a lot, a lot of help for all of us, all the teachers.

Nicole: Along with that is there anything that you guys might, would like to see on it it, so our current idea is we're going to discuss like the recommendations of equipment that has been put in place for PanamaSTEM and like adding recommendations and tutorials, well adding tutorials and guidelines on how to use the platforms that you guys already used for teaching along with maybe I don't know if you have any recommendations for I don't know
Alex: Yeah one of the recommendations for the, if you can put on the website, is like a list of free tools, for example here of Panama I told you is that we have the teacher that have the knowledge and he wants to do online teaching but he does not know how to use the camera on the computer, but he got a good a good cell phone. But how to use a cell phone camera and if he does not have money for lighting, a cheap that he can put lighting and all of that on. And also that for example that he doesn't have to be an expert on video editing that they can use free tools or easy free tools, something that helps someone that is not tech savvy or tech friendly or researching on youtube is a lot of work, if you can put a tutorials on those type of things, that will be wonderful.
Victor: I am think Alex that's a great idea, I am thinking about maybe if you can do a list of the free tools maybe Alex that example, that example of Alex is good, but like Kahoot, you know what is Kahoot Nicole?
Nicole: Yup, yes absolutely
Victor: We can put in the list hey you can use the kahoot as a free tool. Do you know how to use Kahoot? And then you put a link for a video or from a blog, like hey, this is the way to use kahoot. And then the teacher see the tool and see how to use, and actually they practice and they know it. So like kahoot, microsoft teams is another one, oh no microsoft teams is not free. Kahoot, I think Canva, Canva is free, Drawpunto.io, Miro. So there is a lot of free tools that are free and this is a great idea and if you can add it to that website it is good.
Alex: Nicole this one will be a lot to ask but if you can do it wonderful, one of the situations that we get and that is very important situation is here in Panama a lot of teachers are not tech savvy because they doesn't know english, they do not know the english language. After you built the website, with your content if there is any way that you can put like a translate button, so that when the Panamanian teachers go to that website, oh its in English but *boop* now it's in Spanish, then back in Spanish That will be wonderful because the idea, the main ideas, the content part, the website page you can show it to the teachers in the US but also it works in Panama. And one of the barriers that we get here is the english, the language barrier, the english, so if they can go to the website and see that the website is in Spanish they will be like yeah, I can read. But okay the for example the video is in English, doesn't matter it has subtitles in Spanish, wonderful, it does not matter. So that is an if you can do it that will be wonderful.It's just like that will help a lot of us.
Nicole: Personally I know, like this is just that I'm trying to think through it on the spot, but say like we have a home page or whatever and you know maybe we have a statement in Spanish that says for Panamanian teachers that are not that don't know English like,
Alex: Press here

Nicole: Yeah, or if told them, I know specifically on google chrome there is an easy way to translate your page into Spanish, if we had an easy way to do that
Alex: That's wonderful, that works
Victor: So great
Nicole: The guideline and tutorials videos might be another hoop to jump through when we get there but I know discussing it with Marvin you know if you do it in English right now, that's perfectly fine we'll figure it out in Spanish later on. But that is definitely something we can try out best to get a stepping stone so then at that point we can work back.
Alex: Just finish it in English and if you can put a little disclaimer saying press here for it to be in Spanish, that is awesome for us
Nicole: Awesome, that sounds like a really great idea. Another thing is I know we were just talking about you know that you would like to have that list of free tools and resources that teachers can use, our initial plan was to try and work through kind of like a fair amount of scenarios. You know if you have like the money here's equipment that's recommended but if you do not here's a way to go around it so it's the same thing, like both recommendations etc. and kind of havenboth fields of teachers all around
Victor: Perfect
Alex: Good, it will sound a little bit weird but here in Panama we use the expression that the Panamanian it's a little bit elbow, cheap steak, doesn't want to invest money on equipment so that will be wonderful if you can put the different scenarios because here in Panama the majority of it will go to the cheap way with no money and after say one year they say hey yeah we need the one with the money. So yes, that will be awesome to include.
Victor: And actually Nicole, that's a motivation for the teachers to invest in education you know the teachers the first time because you know the schools realize that if the teachers are investing in the education the school has to be investing in education. So that's a good initial, that's great that's great.
Nicole: Alright, that sounds really great, do you guys have any additional recommendations, any additional questions, I think we have really great stepping stone to go off of as we start to continue on with our research and start to actually build this in the next few weeks.
Victor: Okay
Nicole: Any additional comments?
Victor: I do not have questions maybe in a few hours later but not right now, I'll email you for something recent I don't know if I have questions, but I am good right now.
Nicole: Do you have both of our contact information,
Victor: I have one email, let me see
Nicole: I can also send both of our emails um in like WhatsApp because I know...
Victor: Perfect
Nicole: ...your information for WhatsApp and I can send that there, if you guys have any questions or anything you guys would like to send us in the next few weeks of whatever. I think the email that was sent should go directly to both of us but I can send both individual emails as

well. If we have any questions down the line, would there be any preferred method for either of you if we would like to contact you whether it be how to use moodle platform, or anything like that. Where could we get in contact with you or where would you like to be contacted at?
Alex: Yeah for me the most let's say fast way is you can write it on WhatsApp I can see it right away and answer you right away
Victor: Me too
Alex: But if you would like a more formal that everything gets tracked you can do it via email. But for me to be it on the fast track it will be email.
Nicole: Okay
Alex: Because I can basically I am attached to this little guy and all the messages I see it here. So if you write to me I will see it and I will give you an answer right away.
Nicole: Okay
Victor: Me too Nicole. WhatsApp is the fastest way.
Alex: Yeah please
Nicole: Thank you so much I will make sure to send over both of our emails to you via WhatsApp in, right after this meeting, and as we finish up our project and we finish up our report we will definitely send both of those to you as well
Alex: Also if you can, if you have a crazy question of the content just go ahead and ask, or if you need the website we sent and all of that and we will send it to you right away via WhatsApp.
Nicole: Okay good, thank you so so much, Will and I both appreciate it and we will hopefully be in contact in the next few weeks with our final project.
Victor: Great, Thank you Nicole
Alex: Thank you
Victor: Have a nice day
Nicole: You as well, have a great day!

Appendix E: Gianna Pecchia Interview Transcript

Date: 09/08/2020

Nicole: Hi, thank you for joining us!
Gianna: How are you guys?
Will: Doing well how about yourself?
Gianna: Of course! Good thank you!
Nicole: To start this off Will and I just want to let you know what we are doing for our project, and I know you probably already read already in our interview. What we are hoping to do is build a website for teachers to use to learn how to create online content
Gianna: Awesome
Nicole: We're trying to conduct interviews with people who have experience in virtual learning, whether it be like in your case additional help for students taking virtual classes or in other cases where people are actually doing synchronous learning online. So we were looking to interview you about your experience with this, but we would like to ask you a few questions. We wanted to ask you directly if we had your permission to record this interview?
Gianna: Yes
Nicole: Along with this any of the information that you do share with us can be confidential as in we wouldn't use your name or location, obviously we won't be using location or anything like that, but if we would like to quote you in our report if we can use your name?
Gianna: That's okay you can.
Nicole: Sorry
Gianna: I used to this for school to yeah you're fine.
Nicole: But you also obviously have the option to remain confidential and anonymous
Gianna: Okay
Nicole: Along with this full disclosure if there is a question that you would like to not answer just let us know will move on, and if you do not understand a question we can also easily rephrase it. Following this, once our report is more readily available or once we finished building our website would you like us to send over any of that information?
Gianna: Sure
Nicole: And following this interview would you like to see the transcript we make after it, it's just going to be a direct transcript?
Gianna: Sure
Nicole: Alright So what is your level experience with education in general? how long have you been teaching and do you have any certifications?
Gianna: Yeah, so I have been teaching for 5 years now and I am going into my sixth. I am certified in elementary education as well as special education. I graduated from Rhode Island College in 2015 with both of those degrees, and from there I got a job in Woonsocket at a private school doing behavioral Middle School. So something I was not certified in because I was elementary. And that was very difficult, they had no curriculum, and they had no teaching

assistants. And you would have to do restraints and it was a lot. And then I left there thinking I was going to quit teaching all together because it was really difficult. And then I taught a summer program with first graders and they were the cutest things ever so I decided to stick with it. And then from there I did 2 years special education in Woonsocket Public Schools. Before my last two years I stumbled upon a job doing high school math in Providence and that would be at this virtual school.

Will: So at this current Virtual School are they currently running online classes, where I believe at least an email as you said it would start very soon?

Gianna: So tomorrow the teachers go back. Our the 9th grade, IEP kids, final four, and English language learners start on the 14th and they'll be full-time in school. And well the back up for a second my school is a charter school, Public charter, so we are accepting students from every single City and town in Rhode Island. So with that being said right now, because of covid Every District approved to go back except Providence and Central Falls, most of our students come from Providence and Central Falls. That's why our new updated plan is that next Monday, 9th grade and special population will come back. On the 28th of September 10th grade will come back and until then. Everyone has to start on the 14th, but they're to do distance learning until they physically return. A week later 11th grade will come back, and then on October 14th is when Gina Raimondo mandated that everyone be back and that's when our seniors will come back as well and we will do half set ups. They have extended the teacher's day by 2 hours And we will be teaching a morning session and an afternoon session so that we can distance learn. We are in downtown Providence and like everyone is in a cubicle on top of one another,

Nicole: Sol going off of this so you are mainly a virtual style teacher or do you also do in class work as well?

Gianna: I do in class. So it's a very interesting set up, I really do like our school, it is unique, I know it's more for your later questions on like if it works for people. 60% of school is done virtually 40% of the school is done in person. The students are to report from 8:45 to 3:15 every day-5 days a week pre-Covid. What they do is they get all their foreign language requirements, their Science, their social studies, I mean like their Tech courses or any little course they need to graduate, they do that independently on the computer. So we use a program called Edgenuity, and it has all the courses there and students can even pick their courses based on language, or their preference for an elective, or what have you and that is what they are to do independently. Math and reading are done kind of as a collaboration. So for me I teach math, I require the students to watch the video of the lesson, there's a Virtual teacher on the computer, they have to watch the video before, be at the video during class. During class a lot of them, being from inner-city schools, have not learned proper note taking. So my first year I found out Just asking them to take notes didn't do anything. Well the first semester rather. So the second semester, I started playing the videos in class and we would take notes together, like on a document camera, and then go over additional problems as needed. But they were at least to get to that point, that's kind of like their homework, because if they're not at that lesson by the time of class they're not allowed to skip anything they have not done to be on that lesson, so I need them to be with us. So

yes, they can get that material if they're out sick or if they're on vacation or what have you. They are required to keep up with the material and the percentage goes up by 3%, goes up everyday by 3%, so if you fall behind 3% your computer turns red for that subject. No one wants a red screen because then they're behind. So they are required to do it independently but for math and reading we also work with them in 9th grade.
Nicole: Are you specifically math for 9th grade or you also for other levels?
Gianna: At this school?
Nicole: Uh yes, at like the current moment.
Gianna: So at this school I am a 9th grade math teacher but like I said, I am certified in elementary and special ed so I am not certified to teach high school math. When I went to this job interview actually be quite honest I don't know how I actually got there, I thought I was interviewing for an elementary school and then they started talking about high school and I got very nervous all of a sudden. I am not sure why I was there. So I was honest with them and they created a math position for me where I would be the interventionist, With my special ed background I was supposed to be helping students who struggled in math to fill the gaps in their learning, to be able to keep up with the teacher and the rigor of the class. However, On day 3 of my first-year the math teacher quit and I became the math teacher instead of what I was hired to do. My second year they didn't have a math teacher and then this year they told me I would finally be the interventionist, but our math teacher quit last week. So school starts tomorrow and I still don't know what I'm doing. But either way it is 9th grade math.
Nicole: So I was looking at- it is Village Green virtual right?
Gianna: Yes
Nicole: I was looking at your website and I was reading about how it was kind of a blended style of learning, and it seems as though, I was reading it as if, teachers kind of work to fill in the gaps on what the kids don't learn virtually can you kind of expand upon that a little bit?
Gianna: Like I said with math and English it's very Blended in the sense that you're both online and in person. However, we fill in the gaps through NRF blocks as in non Roto Flex courses, and that is basically their electives or their languages or whatever. So we might have and hour or so for them to work on those courses with a teacher where we can help them because those courses don't have a teacher that meets with you physically. A lot of the students love to just play the video, like I can hit play on the video and be on the other side of the classroom hanging out with their friends and so you're not watching the lesson, you're not taking notes, you're not getting anything from it. So having more of those courses or even just having a babysitter to like sit next to them and say nope turn around sit down you need to watch it. It's a really hard concept for kids to do Independent Learning in 9th grade. We offer a lot of programs at our school including dual enrollment and 3 year graduation. I prefer- Everyone wants to come to our school because they can graduate in 3 years, like what kid doesn't want to say oh I graduated high school in 3 years. However I prefer the dual enrollment program, especially if you want to go to college, because a lot of kids want to graduate in 3 years start college and be able to provide for their families, being lower income. However if you do the dual enrollment program In your senior

year your half at VGV and half at CCRI. So VGV pays for your CCRI courses, so it's better if you plan to go to college because they are going to help you financially and your VGV teachers will still help you with your CCRI courses. So it does give you a little bit of a head start and we like when students do that and still keep their grades high Is it helps them to establish their GPA going in. What we found at the three-year grads is a lot of the kids who are graduating in three years and are going to college aren't as prepared whether it's going into the independent study or its keeping up with the work thinking oh it's easy it's just like the Edgenuity program at VGV. And we know college is not like that so we are seeing a big difference with that but those are programs that they offer.
William: Can I ask, just for clarification, I'm assuming CRI is College of Rhode Island I'm assuming at least
Gianna: I am sorry are you guys not from Rhode Island?
Nicole: I am from Rhode Island but he is from Tennessee
Will: I am not, she is, I am from Tennessee
Gianna: Oh I'm sorry, CCRI is the Community College of Rhode Island
Will: Okay, What is VGV?
Gianna: Village Green Virtual
Will: Oh, okay I'm sorry, your school. Nevermind, sorry acronyms
Gianna: Yeah they both have abbreviations
Will: Okay that makes sense
Nicole: So you basically work with these kids and they have their videos and you also showed them how to take notes and do example problems on the side and kind of fill in the gaps that they're not learning. But how do you Kind of help your students navigate the content online given that 60% of it is asynchronous or virtual. The kind of just sitting down with them and make sure they watched videos or that really even a part of it
Gianna: I'm sorry could you just repeat that one more time
Nicole: How do you kind of help your students navigate the curriculum that is given to them online because you said that it is kind of hard for these kids to do this asynchronous learning.
Gianna: So definitely sitting with them in person or helping them get started. Some of the kids just get so overwhelmed and behind when they are in red. For example we had two math courses on their dashboard that last year, from my standpoint we had our regular math course, another course called math lab and that was basically just any gaps that the students would have. Obviously, coming into ninth grade, we expect and want to teach them ninth grade curriculum. When we give them a pre test at the beginning of the year, we find that they can start sometimes as low as sixth grade and so not trying to waste their high school years playing catch up, um, they created a math lab course last year, and that was basically all the lessons from sixth grade to ninth grade that where they showed gaps on their pretest. So each person had their own math lab question, no two were the same and they were all based on like, say, maybe Nicole, you got number two on the pretest. So you have a lesson on whatever that subject was. But William, you got number four wrong, So you would start that lesson, or what have you, they would be

different like that. A lot of the students come in hating math And it's overwhelming, especially if you're in ninth grade at a sixth grade level, like you're obviously going to feel defeated, and probably haven't had good success in the past. So these kids were upset that they had two math classes, and some of them wouldn't do it. Some of them were like, no thanks to the first math class, nevermind the math lab course, so definitely getting them to work on that and be less overwhelmed was huge. And with my elementary school background, I made like math lab mountain, and it was literally a mountain on a piece of paper, nd I took a picture of all of their faces and like printed and cut them out and put like Velcro on the board and like, the mountain was sectioned off by percentages. So every time they went up in their math lab course they would move up the mountain towards completion and having accomplished And like that visual for them was really good. Some of them completed, and some were like, no, I still hate math. And then I, then when COVID started that became like a real, a bigger issue, um, and we worked with them on that, but just being the motivation or finding different things, whether it's bribing or like providing like incentives or whatever, like every now and then I would just be like, okay, whoever has the most growth today, we'll get like a prize at the end of the day, or I'll take you out for lunch tomorrow or what have you. And so all of a sudden, they would spend the whole day doing math lab, and just so I can see that growth and things like that. I mean, their high school, but food really works. Yeah, they love it.

Will: So I'm curious to know though that in the situations in which, so if, they're in these previous- for example, you mentioned example of, of, if there's a ninth grader at a sixth grade math level being brought up towards it. I'm wanting to know, what or if any common sort of online resources that you'd either like encourage them to use or that they might use on their own in order to try to then approach up to then reach that level

Gianna: No, that's a really good question. Unfortunately we don't, especially now because they created this math lab program, because that's kind of what does that for them. And one of our, one of the admins at our school is an engineer and he spends like, weeks and weeks at the beginning of the school year creating this program and this course for each student individually to fill that those gaps. As an entire school, I know they recommend, I don't know if you're familiar with like Khan Academy, but they recommend that for juniors and seniors especially, because it's like really good with their SAT prep. So they do that, or kids looking to do the three year graduation because they have to get so high on their fit and meet certain requirements, and originally, everyone was just able to graduate in three years and now they're like, well, you're not ready. So with more with more years, like our schools only been open for seven years. Well, yeah, seven years. So they're figuring it out each year, but mostly just math lab for the ninth and 10th and then Khan Academy for 11th and 12th.

Nicole: I'm assuming after discussing all of this, the majority of your communication with your students is more or less synchronous and in person rather than any

Gianna: Yeah, I'm in person our schools really unique in the way that come December about, we like to like build a connection and a rapport obviously face to face, and get that level of respect with each other. Then December, my first year was February my last year was December

we give them our numbers, our personal cell phone numbers. I might even do it earlier this year. A lot of the students will work from home. Like they come to school during the day but then some of them will do tests and quizzes or whatever at night when they're at home they can have the time and really focus on it. And so sometimes they'll email us and the email server that we use isn't great, so sometimes I don't get my emails for like four hours. And by that point the kids not doing their tasks anymore so I just have them text me. The school allows that we text the parents. So text calls, FaceTime, in person. Now after COVID we use Google meet a lot of communication any any which way as long as we can communicate with them. We don't care how we get in touch with them.

Will: What, just off the top of your head, could you think of any sort of resources, which if you had access to, would help you sort of help the students sort of in like the with the current situations, like, given the current reopening plan, and sort of how it's operating. Could you think of any resources that would be very beneficial for you?

Gianna: I'll kind of like speak to it just more like a whole of the teacher, um, I benefit a lot from teacher pay teachers, which is, do you know what that is?

Will: I've heard of it. This website where they have lesson plans, right? And they just-

Gianna: Yu can make a free account, they can have lesson plans, they can have like science labs, they could have worksheets, or quizzes or just like key words to make a vocab wall or an attendance sheet or like calendars or whatever. Basically, whatever. I teach you possibly mean, they have it on there. It's, it's great, it's free to make an account. Some of the resources are free and some are teachers who pay other teachers for their materials. So like most people I know like myself, we go on and we like filter free, and then we just look for whatever it is that we need. What they literally have everything. Obviously like, the more extensive it probably comes with a cost. But it's really worth it sometimes their whole lesson plan sometimes their units. Sometimes it's just a worksheet like what have you. I think that's really beneficial because a lot of times as teachers we like trying to reinvent the wheel and we have a million things going on during the day. So like in college. I feel like you don't learn much about teaching in college but more like while you're in the field. But one thing you do learn is like not to remake something if someone's already done it. Just like get there. So Teachers Pay Teachers this great. Khan Academy for math, like I said is great, that's k h a n. There's IXL, which is another great math program. Let's say there was another one I was just think, yeah, it will probably come to me. But yeah, things like that are very helpful, even Pinterest, lots of great ideas, whether it's just to like make a chart to hang in the room or, or what have you, or whether it's like, how to help with like behavior or expectations, like getting those things started even though it's high school. Getting those expectations started like right at the beginning will make or break you for the rest of the year.

Nicole: So with the covid 19 pandemic, And like schools and honestly, just every state shutting down, how did you guys have to adapt on your kind of in person learning when that happens.

Gianna: I have a ton of teacher friends and family members, and they are going crazy. And it was so incredibly smooth for us like I was so lucky. Because this is what we do like our program is online. We obviously like went on and like held Google meets and met with the kids and we're

in constant communication every day still taking attendance because we started we can see if they like login or not for the school day, and what they're working on and I'll tell us what they worked on how long they spent on it. So like if a kid wants to submit a test and they've like spent one minute and nine seconds. I'm like no, you're there's no way So we can track all that on our end in school or at home, and then meeting them in a Google meet for additional support. But all of their lessons and everything, like usual was there. If we had any additional work being met math or English, would let them know. I personally didn't, because they already have two math courses with me their regular course whether it's pre algebra or algebra, and then their math lab course. But like for the English teacher, she would have them like read a book and answer questions separately. So just constant checking in and using the Edgenuity program that was already in place, because it's the same as our day to day basically, except we're not meeting at village green where they're in their house still. But even that was tricky for some people because like I said, we have In our city like low demographics, below the poverty line, everyone at our school every single person gets free or reduced lunch. And a lot of our students, so the upperclassmen to COVID as a time to work their part time jobs full time. So whether they were at McDonald's or Taco Bell or Dunkin, whatever they do for work, they were there during the day. And then at night, they would do their classwork. Because like I said, it's 24 7 365 so they could do it at night. And as long as we checked within the 24 hours that they logged on, we would mark them as here for the day. Some of our other students say the ninth graders are the oldest sibling of four or seven or whatever, and they we send our kids home with a computer. Every single one of our kids were sent home with a computer because we have them in school and they went home with them. But if that's now the only computer they have in their households and they have four siblings doing distance learning, they would all be sharing it. So they might let their younger siblings do it during the day and then our kids would do it at like nine o'clock at night or at least work it's on like a three in the morning and things like that. So it i mean it's it's good that they can access that whenever but that that was a change with COVID for sure.
Nicole: Considering this is kind of like you know, a non traditional form of schooling and you do kind of see like, lower income or who have like, things to do during the day like how does your school kind of like market this like non traditional learning school to the kids and family
Gianna: Marketing, I gotta tell you like, awesome. Marketing must be amazing. Because if you like to think about this whole concept, it's not great. I'm like, these kids are distracted. It's not for everyone. There's no way that I would possibly have ever been a successful high school student with this model. I'm way too ADHD to do learning on my own, whether I was diagnosed or not. A lot of them are there to have fun with their friends or take a nap during the day because they can because they work on their own schedule, and it's just not successful. So their marketing must be amazing. They just started radio commercials. They just started TV commercials. At our minorly our minor league hockey arena, they have advertisement on the For billboards on the highway, they really advertise three year graduation, which is a perk for the students. And they advertise for the dual enrollment. And then for parents well, we'll have a meeting like about behavior with a kid or whatever. And they're always saying like to the parents, well, you know

us we're a small school and we have small class sizes and individualized learning and good student to teacher ratios and all those good keywords to get someone to go to the school. We do have a great special ed department, and the class sizes. The most you can have in a class is 12 kids. So the student teacher teacher ratio is really amazing. It I mean, it is but in life Our computer labs. That's like ninth grades a lot, a lot of kids. So we have two ninth grades. And each computer lab has 35 kids. So that's, that's a big number. And that's the time while they're doing their independent learning and then they get pulled out of there for their classes where it would be one to 12 and they do have uniforms but they're like the most casual uniforms ever. It's just a T shirt that says VGV and khaki pants. So whether you're there because you like the uniforms or you like that, it's free for you because we're public charter. The parents don't have to pay anything, their tax dollars pay from their city or town. So that's a good feature on like a private charter. And all of our students coming because they come from every city in town and they are low income every student gets a bus Pass every month. We don't have any parking. So students and teachers take public transportation.

Will: So, um, this is more asking sort of even even sort of a clarifying off of like, as you discussed with, like, how they're able to market the school, especially to these types of kids, or warning sort of your opinion on the matter, either. So you heard about at least sort of a little bit in general, maybe even more specifics. Do you as an educator believe that this sort of far more online focused like education is more successful for students? Specifically, or is it just more easy for for teachers, is it like more beneficial in order to make it appeal to them? Like, who's benefiting the most about this like

Gianna: It's great for me, as a teacher, I don't have the lesson plan. I don't have to grade. I don't have to think about what am I doing tomorrow? I go in, I open my computer, and it's right there. And I just play the video, I answer questions. So for me, it's, as a teacher. And I think that's why I like the school so much, because as I'm there longer and longer, and I really think about it. I don't think it's great for the kids. Some of the kids do really great. But there's always that small percentage, they'll do great wherever they are. A lot of the kids need a lot of my hand holding. And it's like, you're in school all these years with your training wheels, and then you come to ninth grade and you get the training wheels off and then they don't know what to do. So who can ride their bike and some of them just fall And, I mean, my admin says that they like that I have the elementary background because I incorporate more elementary stuff a lot. And they do need that stuff still. But I don't think it's the most successful model for students. I wish there was a way that it could be done a little differently. Our school is even set up. Very interestingly, it's where I mean, Nicole, you might know but we're right in downtown Providence. So it's like any downtown think of Boston or I don't know, wherever you're from, but it's like any downtown major city. So it's tall skyscraper buildings, and we're in one of them. Like I showed up for my interview, and I didn't even notice that a school. We have. We have three schools within a one mile radius, and they had lock downs at the beginning. My first year they had a school shooting, unfortunately, and we didn't even know knock down. There was a shooting at a Dunkin Donuts nearby. We didn't go on lockdown. No one knows where a school. And so like, yeah, that's a pro.

But it's also a con because we're not a school, we're an office building were like a skyscraper. And they turned it into a school and it doesn't really make sense. So, we have these big big rooms that we put a million cubicles in, and the kids sit there all day and the rooms have no windows. And if they do have windows, the blinds are to be shot. 24 seven, because admin doesn't want people knowing there are children inside, so I mean, it's kind of dark. It's kind of depressing. There's not a lot of movement. You literally like you could sit there literally a whole day. And not even like if your schedule doesn't have math or English on a Thursday. You're just in that room for the whole day. So I mean, it's not really conducive to student learning. We talked about like, I mean, not we, but like me and a co worker talk about, like, if we were to do the school differently, like we would have it in a different building, we would have classes where like the students can move. They say like, there's like arguments in school districts about physical education and having recess and how the kids need to move and our kids like, don't, they don't have art, they don't have a gym, they don't have anything. They just sit there all day. And then they either get obviously if you're sitting on a computer all day, you're they're gonna get really tired and end up taking a nap. Or you're gonna get really fidgety and like, start running around or causing problems like disruptive wise. And so those are definitely two negatives, I would say is like the setup, and the school keeps expanding and they keep trying to expand but like I don't know where they're going because we're using up like the whole bill. They keep buying other buildings. It's like it's insane. So as much as I really do like the school and I think what they're trying to do is great. I don't think it's being implemented as successfully as I could.
Nicole: So kind of like I guess to wrap things up a little bit on Do you have any questions for WIll I about, you know, maybe the work that we're doing to like help educators like you any, maybe like additional comments or recommendations and things that you should be looking into as we go forward.
Gianna: So what do you guys we do like a website or an app?
Nicole: Yes, we're going to be making a website, kind of like website platform, and we do also kind of hope to incorporate some, like tutorials and along with maybe, some pop quizzes so you know as you go along are like looking at different resources and guidelines that teachers can also gauge their understanding and learning content as well.
Gianna: Another website that you guys could check out would be vocabulary.com. I just love it. It's not math, honestly. But, um, we have a lot of professional development meetings on it, they try and get us to us every year as all content areas. And it's whether it's making a word wall or whatever, um, they have all schools in the country in the world that can compete against each other. So like we in Rhode Island can see who's the top score, who's the top school based on that. And it's more of your high performing more financially stable districts, typically, but the kids like to compete and you can earn points, but that's a good resource for Teach us as well.
Nicole: We will definitely look into this a little more.It seems like an extremely beneficial resource to also add.

Will: Well I think that wraps up Nicole and I's questions, we really want to express how much we appreciate this, and thank you so much for meeting with us today so we can learn from your experience, it is definitely going to be helpful in our project. Thank you!
Gianna: If you have any other questions feel free to reach out!
Will: Thank you, have a good rest of your day!

Appendix F: Michael Costello Interview Transcript

Date: 09/09/2020

Nicole: You know I mean, I'm Nicole Racca and so my partner is William Aaron.
Michael: Hi, Aaron.
Will: I, um, Will here I'll actually- yeah, wait it uses my last name on the email so it messes up. Wait, hold on. There we go um, there we go.
Michael: Hi Will
Will: No worries next to each other
Michael: You're lucky you have two first names so yeah.
Will: The middle names Andrew so that's three first names all together.
Michael: There you go. You're triple
Will: by the time. Yeah.
Nicole: So um, obviously we're both to WPI students. And we are currently working with a corporation down in Panama City, Panama called Fundesteam. And they're interested in bringing more STEAM based learning to children in Panama because, their education system is pretty much the same as it has been for 30 years with little to no reform. Um, so what we've been is we've been reaching out to teachers inside Panama, and in like the US and other countries to see what their current perspectives and like, techniques have been, like there's been the switch to virtual learning. Um, so just a few housekeeping questions on Do you mind if we have your permission to record this interview? So we can capture responses?
Michael: Absolutely fine.
Nicole: And so any information that you share with us can be confidential and anonymous. We can not use your name if you would, like on Are we allowed to like quote you in our report and maybe use your name?
Michael: That's absolutely fine. I really don't think is anything controversial in the questions.
Nicole: As long as you're not spilling any tea.
Michael: Nicole, if I want to spill tea, it's gonna be a private session. You and I it's not gonna be-
Nicole: I'll drive down.
Michael: -Not gonna be in a public forum.
Nicole: Um, So, um, the other thing is we've been asking those that were interviewing if, in the end of all this if they would like to see our like, have us send over our a paper and webpage
Michael: Oh, yeah, I would love that.
Nicole: Absolutely. And also, we'll be transcribing this interview afterwards. Would you also like to see the transcript?
Michael: Sure.
Nicole: All right. Will, do you want to start us off?
Will: Yeah, sure. Uh, let's see. Hold on. I just lost my place. That's inconvenient timing. Okay, there we go. Okay. All right. So I guess First things first of what is sort of your level of experience with education in general, like how long you've been teaching?

Michael: I am just starting my 34th year teaching. So I'm back in the old days, I would have probably been already retired. But they changed the pension system in Rhode Island. So that's not happening anytime soon. And I am ready to begin the new school year.
Nicole: That starts the 14th. Right? Ah, so, since the whole shutdown and everything I'm assuming with Warwick Public schools, you have been running online courses like within the past six months, and there's a current plan in place to continue that?
Michael: Yeah. Warwick voted, um, a few weeks ago to continue distance learning because of the physical plant of the schools, lack of adequate ventilation and lack of staffing in terms of cleaning. So, we are starting remotely but there isn't a time frame as to when that will end but we are, we are going to start remotely.
Nicole: um we've recently heard that Gina Raimondo had kind of put a place in, like put a plan in place that as of October she wants everyone to be back in schools. Do you believe that the public school system will stick with that?
Michael: I don't think that it's physically possible for we in Warwick to safely bring everyone back, and I can't see ventilation issues being fixed, you know, in a, you know, short period of time. So, Nicole could tell you my room I have I have one window that opens in the back. I mean, there's no, there's no air on a good day, um, and to which it's just not, it's just not safe. So the the governor has kind of chastise Warwick a number of times she has publicly sort of shamed Warwick when other districts have also voted to begin remotely and she doesn't say anything about those districts, but that's okay. I'm not really worried.
Nicole: The current enrollment at pilgrim Is it still sort of towards Is it like wasn't it like 1200 kids or something in Warwick?
Michael: More than that, It's like 1400.
Nicole: Okay. Yeah. And so the high school just for background information, William, it's all one floor. On. Yeah, there's like, everything's like in squares, little wings.
Michael: Yeah, they're like, they're like, they're like, it's like cubes. There's um. You know, courtyards that the school is built around. And there's one section and Nicole can tell you, it's where like English history like the humanities, English history, foreign language. So if you're switching from that to the math and science area, there's always a bottleneck. I can Can't imagine, you know, trying to get you know, any and and she talked about staggering the passing times and everything but everybody's classes are on a different you have classes with every with everybody else. And you're not going to the next class together. So I just don't see how it how it can work but
Nicole: also like any kind of windows in any of the classrooms, they're always up high. And most of windows in any classroom kind of faces that courtyard, it's very much very much not good ventilation for any means, Not at all,
Michael: at all. Not at all. So I can't really see out this is like a bank of, of one section. And there is a window there but you're not allowed to open it for ventilation purposes.
Will: So, since like it's essentially like it's

Michael: it's a rescue window. Yeah, jump out into the courtyard in case there's an intruder. I don't know really. But
Nicole: so um, obviously, through the shutdown you were using, like completely virtual learning, but how long have you possibly been using like kind of online education platforms, whether it be like Google Classroom or anything
Michael: I was fortunate that I was already comfortable using Google classroom and and the meats and everything. So it wasn't, you know, a huge stretch. I myself think that it was a pretty positive experience for myself, you know, on my end and for the, you know, the students and the students that I felt, um, gave up. Were the seniors in my elective class that probably didn't need the credit anyway. Those were the ones that I kept saying, you know, like you haven't done anything since we left in, in the middle of March. Are you going Do anything and so, and they were I had two class, they were probably 10 in total, you know, and they just, you know, they just didn't need the credit and they, you know, the rest of the of my classes, you know, they were on top of things they, you know, they handed things in, they follow deadlines, they did everything, you know, everything that they were supposed to do.
Nicole: So for like purposes of content distribution, did you kind of just like upload on like lecture videos for them to learn?
Michael: Well, you know, the, it was interesting in the AP class in my AP class, College Board, because there was like that a couple of weeks where they weren't sure what they were going to do then they had canceled the SATs and the PSATs but they they made that decision to to continue with the AP testing, but the format was going to be different and you know, because they were doing it at home How is that going to work and college board itself, um, put out a review videos by units and I watched a couple of those were really good. Um, so I would post that Nicole knows my process. Um, they still have the study packets, they still have the essays they still had, basically all of that I would sometimes tape not an entire lecture, but five to 10 minutes sort of a highlight thing this is like really what's important that you need to know you know, if we're doing like causes of world war one right here the four main causes, you can get the details here's the reading. I'll post the you know, the reading. I have found up a PDF of the textbook that was able to because again, when we left that Friday, no one kind of knew what, you know what I mean, like what was happening. And, you know, no one was allowed back in the building, the kids didn't have their textbooks for the most part. So you kind of had to do things on the fly. But, um, you know, I think they were pretty successful at a lot of fours this year. So, um, I was quite happy with the results.
Will: What are some? Well, I'm curious to know that then in that case, because you only mentioned like some of the College Board videos in terms of like, the content itself that you then like taught, what are some other examples of content that you then like, used or like created in order to then like continued on with the class was it like just the college board videos are like,
Michael: Oh, I myself, um, especially in my I don't use them that much in my AP class, but for like the regular West Civ class, and some of my electives, I have PowerPoints. So I would post I would post the, I would post the PowerPoint. And we'd spend part of like the, you know, like the

Google meet portion of it, going over the PowerPoint, you know, but they would have that in classroom already. And, you know, again, they can do a kind of one or two ways you can look at the PowerPoint first and then listen to me or you can listen to me and then go back to the PowerPoint. So I usually let kids decide. And most of them probably do neither. But I usually let them kind of like you. You have to find your own methodology of what's, you know, successful for you and what's not So, and I'm not wanting to get obviously I'm not one to like overload kids like an AP class, you have notes, but I'm not wanting a regular class that there's, you know, all this extraneous stuff that you don't need. It's it's pretty much the nuts and bolts of a particular unit or section is what's expected of them.

Nicole: So when creating this content, do you use any kind of like online amenities or interactive applications to create any fun engaging content for your students?

Michael: We did like, we did some online Kahoot stuff. Like we did that, um, you know, the problem I ran into and I have a feeling it's going to be the same is the, a lot of the upperclassmen. They were working as many hours as they could, and they were working during the school day. So last year, you know, it was You know, whenever you get this done and as the time went on, I kind of lengthened the expectation of the due date. And I would make it like Sunday night at 11:59. You know, and give out the work like at the beginning of the week, and it was due at the end of the week because I had so many kids say to me, you know, my, my parents or my mom or my dad or whoever they're laid off, I have to work in order to bring some money in. There were there were more of those than you would expect in a suburb like, you know, Warwick, Rhode Island. And I just didn't think that it was fair to like, you know, you have to be at my Google meet when there's bigger issues going on in their family in the world, you know. Now this year, we have been instructed that they have to attend if they are not at your They are marked absent, and there's some kind of a consequence. So I don't I don't know how that's going to work because I, you know, can foresee the same situation happening with kids have obligations and you know, if you have to choose between, you know, a class and feeding your family you know, I don't know what what's going to happen.

Nicole: I've been in touch with [redacted], and like she was that same boat is like she was working and she plans to continue

Micheal: She works at McDonald's. She works a lot of hours.

Nicole: Yeah, she was there the other day. She I think she had like a 10 hour shift. She was telling me She's like, I gotta go, I'm done with my break. I've been here for like, eight hours got two more. That's wild and like the same with [redacted]. I think you had her as well. But I didn't personally expect that but I also had You know, we had this project, we were supposed to go abroad. And then we weren't. And as much as it's a full time job, we didn't really have as many requirements. And my current plan was to I was supposed to work at my internship and continue there and I haven't yet but I'm back at my research lab and I'm still doing research.

Michael: I will give you an example. I'm not going to use the name but I had a girl who was in my regular West Civ class. She probably belonged to my AP class, but she's she's just not a Hitch and just like history. So she had like a 99 average the entire year without without like

breaking a sweat in our in a regular class. And we were told not to give like traditional final exams in June, like you, you do some kind of a capstone project, sort of a thing and it was supposed to take like, you know, two to three weeks to do so. And they were like, you know, due dates and everything. And she said, No, she said to me Look, she said, I, you know, I'm working two jobs. You know, is there any way that we could, you know, could I just turned the thing in without, you know, all these, you know, I knew she would do it. She literally was on top of everything. And I just said to her, I said, You know what, don't even worry about it. Because if she was a senior, she would have been exempt anyway, because of her of her average. Why should she be penalized because she's a junior, on top of everything, like what's the whole purpose of of this? You know, I do think you have to be flexible and and I know that there are quite a few teachers that are inflexible, you know, but you're in the middle of a pandemic and he has a girl working multiple jobs, who doesn't really need to do that. Whether if she did the project or average wasn't going to move a decimal point like she was going to get an A plus on the project she had an A plus her average isn't going to change. So you're going to penalize someone for that.

Will: Yeah, so sorry, just filling out this here. Okay. So what is what would you consider? So I, let's roll back at least a bit to like the the the PowerPoints that you mentioned beforehand. What was your process you also mentioned that like you don't want to inundate them with like material that's like unnecessary or anything. What is your process then for like creating the PowerPoints? Because it seems to me like

Michael: I make them up myself. I mean, I think it's, it's easier when you have many years of experience. To know, when you have a particular content, what's the important stuff? And what's the stuff that can go? Because we found, and it's going to be a problem this year as well, curriculum wise, something's going to have to get cut. Because you can't, you can't in, you know, in a history class, you're not going to get to where you need to be. Unless you cut out the stuff that is relatively unimportant, and you can, you can make a claim that everything is important, but that's just not being realistic. So you have, you're going to have to chop somewhere. You know, so I think, you know, when, when I was a brand new teacher, I was so afraid that I wasn't going to cover every single bullet point in the book or every single, you have to mention every little single detail. And when you look at the big picture and that comes with experience, you want the kids to have the big picture. I don't necessarily need all those, find minute bullet points. Because you know what you can, you can find that you can find that here in literally five seconds.

Will: In such a case, just for like further clarification, then as you're trimming down and focusing on what's really important, how long would you say that takes you nowadays, considering your like, extended experience

Michael: I can, I can, I can look at a slide and say, You know what, this isn't really that important. We're just gonna go on to the next one. And don't worry about it if it's all good. You know, but conversely, you have to understand too, that if they've been exposed to that information, you can't assess them on that either. You know, you have to, there are some people

that use the same tests from 20 years ago. But if you're not, you know, covering the same material, then that's not a valid assessment where, you know, you have to expect them to perform when they haven't been exposed to the content.
Will: Does this apply to both sort of the both the PowerPoints that you created and also like the little short, like videos that you've made as well, this apply for both?
Michael: Or just in a discussion
Will: Okay, so it applies for all over
Michael: what I choose, you know, like what I would choose to do, you know, like, we're not doing that we're gonna we're gonna move it on, you know, we're gonna, this is this is it? So, um, last year in AP, they stopped the content at 1900. So they made the decision, College Board did that there would be nothing on the exam. That was before World War One, let's say. So the entire 20th century wasn't going to be assessed. So it made it easy in that class because Basically, it's like, we don't have to worry about the 20th century, unfortunately, you know, um, but the last thing that we did was was right when you remember 1917 that movie? The 1917 Yeah. Was it was like, though, the last weekend before Corona. Um, I went to the movies with my AP kids to see 1917 and we were the only ones in the movie theater. So I don't know if that was because of Corona. Or, you know, at this point in time, nobody wanted to see 1917 but it was nice because I could just sit there and we were the only ones. And I could I could sort of like lecture while the movie was going on and give them you know, some, you know, details about you know, the trenches or whatever. See how they're in the German trench now and how deep and they made a concrete and when the You know, when the movie started, they were in the British trenches, and they were kind of temporary. And so, you know, stuff that you know, you would you could do, but if I was, if I was in in class and I was running out of time, then my whole trench discussion, I would have ditched it because you just, you just don't have the time to do that. But again, that's, that's all experience. That's something that you just, you just know, there isn't any way to, you know, to read about that in a in a book, you just know what has to go. And you just, you know what I mean? Like you just do it. It's a must be like for a medical professional, how they do triage. don't mean like, you can't read about how, you know, if you see someone that that person gets immediate attention, you just look at them assess on the spot, and you decide like who's going to be treated, where they're going to be treated, how they're going to be treated? Right then in there. That's Kind of the same you know, with a teacher is when you think about it when you're a teacher, you you are making thousands of decisions in any given day. How you know, like you don't read a script you're not you're not you are you are on when you are actively instructing. And every minute you're deciding what you're going to do and I'm gonna do this with you, but you don't think about it, you just do it. It's just automatic.
Nicole: So when creating like your virtual content, did you find any specific aspects or things that worked well, to engage your students and make sure that like they were on top of like, topics that are being learned?
Michael: Again, it's it's hard because, you know, the, the Google meet, I found, could be awkward because, I remember one incident there was a girl lying on her bed. And she was in

pajamas. You know, and it's like you don't want to address it's like, it's like dress code violations like I you know, you address it and then it's like, Why? Why are you looking at me wearing you know, so it's like, Okay, so then I look and the door is open and it looks right into her bathroom. And her dad is walking by. And he's like shaving I'm like, okay, like, this is you know, weird, like it's, you know, I mean.

Nicole: I attended classes from a recliner. And we had four of us doing school and like work from home and just like anyone would walk by me sometimes I'm like, you know, if I was actually on zoom, it would be weird.

Michael: Again, we are we are expected to hold two meets per week. So that is that is the expectation to formal meets per week. If you want to do more, you have to get permission because the schedule is is set in stone. And it's not rotating. That's going to be something else this year. That's going to be interesting, because period one is always at 7:24. So it doesn't rotate. So I have I'm a senior elective. I have my American legal class period one, mostly seniors, I have a feeling that seniors are not going to be getting up at 7:24 to be in my Google meet. No, I mean, I know that so. You know, but what can you do? The other thing, Nicole, I don't know if I told you this or not, but I Went back to college. Yeah, I'm getting my degree in business. So, yeah, I needed something in Corona times for myself, you know. And so I took a class over the summer and I'm taking a class now, it's made me a little more reflective of my own practices. You know, and one of the things I liked was, you know, if you have a reading, and you have to post your interpretation of that, you then have to comment on two other people's interpretations. You know, when, for the most part 99% of the time that positive comments a couple of times, they're, you know, a little a little negative, but I kind of liked that I'm going to somehow incorporate that this year. You know, have some kind of a primary source document have their analysis and I think I'm going to do you know, they only have to post one but you have to, you know, like you have to comment on, like peer editing sort of, yep, you have to comment on someone else's analysis and, you know, kindly not you don't want criticism of them.

Nicole: Even like before Corona, we have had like a lot of professors here, they'll start discussion boards for that, like sole reason where like, they'll send out an article or paper or something like that. People throw up their, like analysis of it or their ideas, opinions and like, you have to comment and I think it's, I haven't personally do it. I would love to do like, I love talking about things like that.

Michael: No, but and I think it's good because we all know that there are some people that are very comfortable talking in class. And then there are some people that is the worst experience of their life is if they get called on. So this way, in the written form, you can actually hear their voice because if if you were doing it You know in a in a live setting like this they would never volunteer to be to be heard. And and again I hate calling on someone that is so painfully shy that it literally ruins their day. So this way in writing if they respond you know you still can can you know assess whether or not that they you know understand what's going on, but it also gives them an opportunity to contribute.

Nicole: So I know we were discussing earlier that you'll make some like quick 10 minute videos to post to do like a quick overview on what like physical types of equipment Have you been using, we've just been using a webcam or-
Michael: I would use my phone and then post it to classroom.
Nicole: Okay, cool.
Michael: Like and just like myself like nothing formal just, you know, just a quickie little all right here. Here's what you need to know. Because people aren't interested. I mean, I think the attention span that most people have is probably 10 minutes or less. So the minute you start, I had a PD this morning, where the woman droned on for 48 minutes. And literally like halfway through I just, it was like background noise. You know, like-
Nicole: if you were to like continue creating this content, let's say like later years, would you ever want to kind of like, learn or understand how to do like a more formal setup, or do you think yeah
Michael: I think the thing that hurts me is my age because I'm, I'm resistant to the ever increasing change in technology. You know, where younger people, you know, they're like, Oh, you know, I got just got a new upgrade or I got a new phone and I'm like, Oh my God, please keep my phone so I don't have to learn the new, you know, a new system or whatever. I think that's the difference between, you know, generations whereas younger people in Braille like oh, like I this is so cool like, look what I can do now on my phone and older people and more like, Oh my god, I have to learn how to do that. I don't wait. I don't want to learn how to do.
Nicole: So you'll never be like one of those history teachers posting tik toks or anything about that about their content.
Michael: Oh Honey, not on my content. But did you see my Tik Tok from last year?
Nicole: What no?!
Michael: I was Tik Tok famous. It was trending. We did it, it was the week, it was spirit week. And I well I dressed up as Chad, I was a Chad. So I had my red solo cup in my lacrosse stick and my Vineyard Vines outfit and I was in a tik tok I'll have I'll send it to you if I can. But yeah, I was tik tok. I'm sure you can find it. It was I even started at tollgate. So it was. it was all over the city.
Nicole: Over quarantine I did a project where my partners and I analyzed our social media usage during quarantine. And it was scary. So social media is kind of removed from my life for now and it's the best thing.
Michael: So I'm not, you know what I mean? Like I'm not, I'm, you know, I don't feel like I'm obsessed or anything like that. I know it's a tool. I just, it takes so much time just to go through, you know, and I'm not even, you know, basically Facebook is about is about it, I have an Instagram and I have a Twitter and I have all that I just don't use it. So I don't snap anybody so
Will: What would you consider are probably some of the challenges that you face with like creating and like dealing with online learning content instead of bringing it out?
Michael: You know how you how you engage the students in a classroom, I can do it through humor. I can there are a lot of ways that you can you can do that. Online is totally different. You

know and I and, again because it was an emergency last spring You know, I thought all summer about how how to do it more, you know, because you're only going to have them twice a week on this, you know, kind of a setting like this. And I'm not exactly sure, you know, because if it's just straight history, they're going to get lost in the first five minutes. You know, I find that I can, I can get people interested when I make them understand that history is relevant today, even if it's something that we're studying 400 years ago because you can bring that right to today and understand that cause and effect relationship. You know, I always tell them like history is like the GPS, you can't know where you're going until you know where you've been. Everybody has a starting point, your GPS has a starting point or you didn't get there. Accidentally you There was a reason why you started where you is the reason why my car is in my driveway right now. You know, I mean, like I did errands and I came home to be home for this, like there's a reason for that. You know, so that's, that's history. It's going to be more difficult in this kind of a setting than when I'm, you know, in my in my classroom, but as I as I've thought about it all summer, all you can do is try do you know what I mean? Like I'm not willing to give up or anything, but I'm gonna do the best that I can. Because it's no one's fault that we're in a situation like this.
Nicole: Along with that last year, did you see any on like challenges with either students falling asleep during any Google meets or just like more excuses than you normally would find.
Michael: Again, the Google meets, the ones that I'm the ones that attended. were, you know, they attended, I did have quite a few who I'm either said they had to go because we weren't really good at, um, sort of, like, you know, like in a period block you had and Nicole would know is there's quite a few teachers who think they are like the bomb and so their subject matter or their presentation is worthy of the three hours that is eating into my time and they would not they would not relinquish their time even though it wasn't their time. You know, so you had a lot of students having to pick and choose you know, like, Am I going to go to English with You know, the guy thinks he's, you know, Shakespearean actor. And so he's got three hours to talk about Beowulf or, you know, am I gonna go to a history lesson where the guy really doesn't care if I'm there or not, which, you know, like, I'm not gonna penalize somebody who's not going to be there. What are you doing? You say, like, Oh, [redacted] is doing a three hour Google meet, so I can't go to yours. Am I going to say, okay, you know, it makes more sense. If you know who the players are. Nicole knows if, I gave Nicole list of names, you don't understand exactly who I'm referencing, but there are people who think that they are very important. And so therefore they need three hours to do their lesson and other people aren't that important. So you don't need the time. So they did fix that this year where there is a set schedule and you have to follow that, that schedule. So I'm hoping that that's a little bit, you know, better for everyone.
Nicole: If you had any access to any, I don't know, resources to, like, alleviate some of the challenges or make content more engaging or if you even had on like, the explanation to use any like resources. Can you like think of any that you'd like to learn?
Michael: Yeah, I do better one on one. So I do better when I physically can experience it myself. watching something from a video isn't the best way for me to learn. So way back in the day when we started doing online grading, we didn't have any professional development. We were told To

watch a YouTube video that the city of Cranston produced as to how to use Aspen. So I, I basically taught myself how to use Aspen. So if in the best possible world, if I could have like a, like a techie or an IT person or just somebody who is really savvy when it comes to that, sit down with me, which again is challenging in Corona, but sit down with me and show me a few things that would help. Like this morning, I went into the building. And the the tech person, Mrs. Randall showed me a couple of little tricks. Um, you know, because they have the Google meats embedded into the Google Classroom format. So all that basically all I have to eat like last year, we had to schedule it through the calendar, and it was kind of a The but this year it's embedded into the Google Classroom. I just have to go on to my Google Classroom kit like Google meet and I've already opened up the window the kids already have the code so it's like you know they know what the schedule is you know so it's like it should be it should be perfect.
Nicole: So for you personally believe like one on one one on one help would be better than like even if you had like kind of a manual like read this.
Michael: I mean I manual is better than nothing but yeah. For me I need multiple opportunities to perfect the even today when she was showing me you know, she showed me a one class added whatever I needed to do I need to do for all five and she showed me the first time that when she was going to leave I'm like, don't leave until I'm don't leave until I do all five like in case I in case I mess up. Um, because it was a way you had to manage manually, anyway. But I personally would do better if there was a person who could, like show me versus just the manual. She sent me the directions. I'm in an E and an email. And I was like, I'm in school on Wednesday, by chance we'll even be there and could you like stop by my room, I promise to wear my mask and, you know, show me you know, kind of what it is that we need to do. The where we have the opportunity to if we want to go in to the building and do our Google meets. And that's what I'm going to do. I'm going to go into the building, because there's four people in my household all trying to use the Wi Fi at the same time all on a different schedule with different different things and No trying to get it all set, it'll be a challenge.
Nicole: My mother is also in that same boat where [redacted] is asking them to come in and teach virtually from their classrooms at least, especially to kids who are probably across the hall in their own actual classroom.
Michael: And again, it's totally my choice. It's an option. You know what I mean? So, um, I just think like today I got, I was there. I got a lot of work done there was I shut the door, you know, there was nobody around, I can take my mask off, do what I needed to do. And then I just been I just left so it was was actually perfect.
Nicole: Do you think um having like the resources available like, you know, like a chalkboard or-? Do you have like a document cam? Do you think that's going to help?
Michael: Document camera that I've used. I have my Promethean board. I think it'll be it'll be easier. I have my old fashioned maps, Nicole knows I always would reference the my big, my big wall map. I mean, I've got my stuff. I'm in my room, I would just make it, it would definitely make it easier if I was there.

Nicole: Is there any additional like maybe virtual resources other than Google classrooms or Google meets at Warwick Public Schools has, like given you guys licenses to?
Michael: They asked over the summer if we had any, you know, any requests. And I just said if we could get just an online version of the textbook, that alone would solve you know, much of my problem. They couldn't get that done. I found which is probably illegal, but I found a couple of um, [redacted] I found a couple of PDFs of the books I use. So I found Spiel Vogel which was my main because again, my main, my main concern, but my first concern is always my AP class. And I found a PDF of Spiel Vogel so I'm like, okay, that's one. You know, one thing off my plate. I found a PDF of the street law book. I found a PDF, the regular West Civ Kids. The book I use is from 1994. It's not even it's not even not only not available, it's not even publishing. It's not even a newer edition of it. It's it's out of print. So I found one that was pretty close that I used and then the specifics, I found up a PDF up to chapter four. So once I get past chapter four, I don't know what I'm going to do, but You know, I also can't worry about a month from now, I have to concentrate on Monday. That's my, you know, not look so far ahead. Let's just get all my ducks in a row for Monday. And, you know, go from there. But that would be my number one if I could get like if there was like a school purchased, you know, online version of the textbook, that alone would solve many of my problems.
Nicole: So what is your kind of like first day, especially like Monday, what does it look like
Michael: On Monday, it's like, it's like a regular day. And then all the classes are meeting on Monday. And we've been told that you have to go over policies. So policies and expectations, especially with the Google meets, so I don't want to like a similar The teachers are talking about, like a dress code. Like, I don't want to, you know, like, you know, no pajamas. I don't even want to address that. You know what I mean? myself like, I don't know, I don't want to go there. Um I'm gonna ask that they turn their, their camera on. You know, um, I know a lot of times the cameras off I, you know, again, the problem is, is that you set the rule but there's no what what what's the punishment supposed to be if they don't? So if I say my expectation is that you leave your camera on, and then somebody refuses to put the camera on? What am I going to do go to their house and give them detention? Like what? You know what I mean? Like what's the what's the consequence if they don't do What what you want so because no matter what I'm going to end up losing that, that battle so do I even want to get in that fight so I'm going to say like, I really want you to put the camera on. But that's not the hill that I'm gonna die on. Like I'm not that's not happening because you're gonna you're gonna end up losing that and Nicole knows I get along with most people like I'm not I'm not the type so you know like the teachers that like they throw a kid out of the room because they don't have a pencil like you've you've wasted time you've wasted the lesson. Like he has a pencil like let's move on like move you know, moving on, but like, I'm not gonna fight over stuff like that. So it's mostly policies and procedures on Monday.
Nicole: On Have you run into any issues where maybe like a kid is like Like, oh, I don't have a camera or anything like that, because I know they give the Chromebooks that have the camera?

Michael: No, but you know what issue I did run into in the spring was I started using Google Forms for my assessments, because there's a lockout feature where they can't, they can't like look at something else. And then the kids figure that out. And then suddenly, everybody's Chromebook was broken. And they had to use a laptop or some other some other device where that same feature doesn't, doesn't work. Or I'd have to like upload a different version of the quiz. So I'm like, whoa, I'm making myself you know, I'm making way too much work for myself. So I'm part of Monday's routine is like you need to use your Chromebook. The Chromebook is broken. You should have had it Fixed over the summer. You know, I'm not providing an alternative assessment, as I'm going to lock out, you know, to be able to access other things and you won't be able to take a quiz.
Will: So in terms of like, I know we mentioned beforehand, the premium for that document can like that's stuff that you currently are working with.
Michael: Yes
Will: What sort of like do you know if you'd like or have looked into any like services or programs or things that you would like to learn or like a way to sort of enhance like, or to better the visual content that you create, or the online content that you create?
Michael: It seems to me a lot of the elementary teachers use a lot more of the available programs. I mean, the secondary teachers tend to, I think, be more traditional, you know, when it comes to their teaching, probably because it's so content driven. You know, that I could, I suppose, but my point is, is like in the last couple of years, years of my career, it's it doesn't. It doesn't make any. I don't know, I don't feel like it's gonna make anything better for me to learn some of these new technologies or new techniques in those last few years of my career, you know, I'm kind of, you know, it's like you're on the highway and you're you just, you're at the top of the hill, like I'm way, way down the hill. So I'm, I'm almost almost ready to, to call it a career, I'm not going to, you know, invest the time and energy and focus on things that you know. And the other thing is, I found like with the younger teachers, they're really good at technology. But they don't know anything about content. Like they, they're there. They're not like they can do all this wizzy stuff, but they're not comfortable in the actual content. With me, I always felt like you had to be comfortable in your content. And then the rest of the stuff would come. You know, like classroom management, like you can't have any, any classroom management if you you're not comfortable in what you're teaching, if you're constantly yourself looking up, okay? Um, you know, what's the third thing on that I want to get? If you don't know what you're doing, if you don't know history, for example, I can't teach it. So, you know, the flashy kind of stuff, you know, and they have and they have the flash they just have no idea what the flash means. That's kind of what I've found in my know that a newer teacher compared to a veteran teacher, so to speak. So if there is out there, I mean, somebody wants I'm not I'm not going to look for it myself. Personally, you know, I'm quite content with the platforms that we have like the, you know, like the google classroom and you know all that and and Warwick is not going to invest in anything that costs money. And it's funny because they, they, you know, they tell you the lies like everything is Google driven, Google base and you go anyplace else like in the college, I'm

taking classes. You don't want anything on Google. They want Microsoft Word. They don't they don't want Google products like they want Microsoft Word. They don't want that we tell our kids Oh, you know, like Microsoft is out you need to know you know, word for it. You know, like Microsoft. Everything is going to be Google based in the future. lies lies my school told me you know, there's number one, everything is Google driven. You know that you want Google because it's free. That's that's that's what it is. And anything that they have to pay to upgrade Warwick does nothing. Turn It In.com. No, we're not going to pay for the upgrade. We're going to do the cheapest, most basic version that there is Aspen cheapest, most basic version that is that ever going to do the gold plan they like on, you know, the bronze plan or whatever.

Will: Do you, or this is sort of a bit more of an opinion question but sort of like as a teacher and with both the difficulties from the end of last semester and then even starting out now. As an educator, do you think that this sort of online education is sort of is it, is it successful so far with like teaching your students specifically?

Michael: Um, I think it went as well as could be expected I have a fear that the powers that be are going to use this to say, we, you know, we can save a heck of a lot of money by doing some, you know, format of online instruction, and then you don't really need a teacher. You know, you could you could have a paraprofessional, sort of like even if you even if you did went back to a traditional school kind of a setting. You could have a paraprofessional July like the classroom management part. You could like everybody's working on the same assignment. Everybody's working on the same presentation, everybody's doing the same thing. You know, you upload your assignment or you upload your assessment. There'll be a you know, like a certified teacher who corrects grades or assesses That and you could fire you know most of your teaching staff really I mean it's, it's like automation in you know manufacturing it's the same it's the same principle. I worry about that sometime or somewhere down the road. But um you know for myself I think it went as well as could be expected last spring you know, and I was I was pleasantly surprised that the kids for the most part did what they were supposed to do.

Nicole: So I know you have both your daughter's, um, and [redacted] was a senior this year right?

Michael: [redacted] did [redacted] did Running Start so she was at CCRI.

Nicole: So good

Michael: Yeah, already. She to me, she graduated, but she already had um a year's worth of college credits, you know, so she chose to stay because which I'm glad she did, because so many colleges are doing virtual learning. A lot of them that being sent I just saw was the University of South someplace like they, the kids were only there like a week or two and they, you know, got sent home, you're spending a lot of money, not knowing sort of like what it's going to be. So she stayed at CCRI and I was thrilled with that because she'll have her associates next year, and she'll still be 18.

Nicole: So as a parent on how did you feel about this, like, I understand it was kind of, there was no opinion like it just kind of had to happen, but like, how did you feel as a parent like this jump to virtual learning Like, how did your daughters adapt?

Michael: So [redacted] was a sophomore at [redacted]. Um, so, you know, I understood the, you know, there was a, there was a range of, um, like, some of the teachers that [redacted] had like, way, way, way, way too much and a lot of it was like busy work. You know, a lot of it was just like, oh my god, like, I think people were afraid that if you gave too little work, you'd be judged that it was too easy. So they, they tended to give too much work. You know, finding that finding that balance virtually, I think is is difficult, but like, I didn't, I didn't have to contact anyone at [redacted] like it was it was. It was fine. She you know, she did well.
Nicole: And [redacted] just moved all to Virtual Learning?
Michael: Yeah, but he like last year, um, you know, she was at CCRI only. So for senior year, she wasn't at tollgate. She was already at CCRI. And then they transitioned. Same thing. They, you know, they transition to all virtual. So she was used to that, you know, that she was used to that platform there, you know,
Nicole: Do you think it kind of still gave them on like when they move to virtual learning do they seem to retain the content as well as they might like in person setting or?
Michael: I mean, I don't think that any virtual setting can match that dynamic of a classroom. And you know, we've everybody's been in a classroom and maybe it's that particular day, but it's really clicking in that classroom. And there's that back and forth, being the kids and the instructor and it just, it's kind of like magic. It's kind of hard to To experience that virtually, you know what I mean? And I know myself taking these college classes now and it's been a long time since I have been in college. It's, it's everything is, is there's no interaction with the professor. It's like every week, here's the here are the assignments. You know, it's due at the end of the week, you know, you take a quiz or test, boom, the next week stuff gets gets uploaded, you know, at at 12 midnight on Monday morning. So, you know, it's not as but you still learn, you know what I mean? Like I it's not an ideal way of learning I kind of miss sitting in a, in a classroom. You know, speaking as a student there was, it was hard to, you know, be like, Wow, I can't, you know, I can't believe that I'm on the other side of the desk right now, but You know, it's also in one way good that you're, you know, it makes like I said, it makes you more reflective of your own practices when you see somebody else and what their expectations are.
Will: So, I'm curious to know, again, this is a bit of like an opinion question, but, um, you your experience in for teaching is so focused in with like teaching history like as subject. Do you think that I guess it might sort of depend on the subject but if like history itself as a subject for like, online learning would work better or worse as compared to other subjects?
Michael: I think it works better. That I think History works better. I think, um, I think someone like a science like the sciences. The math. I think it's harder. I just, I just think like, I know myself, like doing a math problem, like on my own versus watching the teacher do the math problem or a lab in a science class. I think you physically have to be there. Not like watching the lab and a YouTube video, or whatever. I do think it lends. I mean, it's still not ideal, but I think it lends itself easier in a history class or an English class. I think that it does, you know, in a math or science.

Will: Would there possibly be like, um, like a subject that would work better than history then in that case, just curious or not, or do you feel like history?
Michael: I just, I feel very, I guess fortunate because I personally didn't kind of like struggle with you know, and even even my daughter, she found the, you know, the history part easy compared to, you know, some of the other classes. And again, a lot of that is is teacher driven, but, you know, just you know, here's, you know, here's either a reading passage or here's, you know, and you know, [redacted] teacher last year, Nicole knows [redacted] like [redacted] teacher, [redacted]had [redacted]last year so she, you know, he's, he's a very lively and energetic and he posted videos and he's funny and it's, you know, it's, it's, um, you know, again, a lot of times it's personality driven so it's easier. So.
Nicole: I can definitely see on [redacted]just like bouncing off the walls and doing that making it super fun cuz he even was like that just like as a teacher as a coach and everything.
Michael: Exactly, Exactly
Nicole: Well, um, I think that kind of wraps up at least some of the questions that we have about your experience with teaching overall in virtual learning. Do you have any questions for us and what we're doing?
Michael: No, but if you need, um, follow ups, just let me know, Nicole, I'll be glad to help.
Nicole: Absolutely. Thank you so much. We really appreciate that.
Michael: Welcome. You are welcome and stay in touch.
Nicole: That's really good to hear. Yeah. Um, is there anything else that maybe you've touched upon you want to add anything more to add?
Michael: I just, to sum up, I would say that distance learning is not ideal. But in my experience, it was more positive than negative. Because I really felt like the kids that even gave a minimal amount of effort still learned something. It was, in my experience, I found, you know, so and that's kind of what we're all about. You know, you want to want the kids to have learned something you want to move them from point A to point B by the end of the year.
Nicole: Well, we really, really appreciate you especially on such short notice, like coming on here and chatting with us.
Michael: Anyway, I can help you, you know that!
Nicole: Absolutely. Thank you so much. And it was really great to hear from you. Alright, well, thank you so much.
Michael: Bye Bye guys!
Will: Have a good day!

Appendix G: Jennifer Nygren Interview Transcript

Date: 09/12/2020

Nicole: All right, um, so just to introduces ourselves. Um, I'm Nicole Racca. That's my partner William Aaron. We both go to Worcester Polytechnic Institute. Um, for the first seven weeks of this semester, we were supposed to be in Panama, completing our interdisciplinary Junior capstone project. But instead now we're working with the same Panamanian Corporation virtually and their goal is to bring more STEAM education to students down in Panama because they do have like a lesser education system, it really hasn't been reformed in the past 30 years. Um, so we are working to create a virtual resource for teachers whether peddle like in Panama or outside Panama to learn how to create virtual learning content. Um, so we wanted to interview you about your experience with online learning, especially after hearing that you went to like a professional development webinar this summer. But just for some housekeeping questions, if you don't mind, do we have your permission to record this interview?
Jennifer: Yes
Nicole: Um, and any information you share with us can be completely confidential and anonymous. Um, do you consent to be quoting quoted in our report and like can we use your name if we quote you?
Jennifer: Yep
Nicole: All right. Um, and Everyone that we've been interviewing, we've been asking, if you'd like to see a report and, like mock up of our website in the end along with the transcript after we interview you?
Jennifer: Whatever works for you. So you're, you're in America right now. Yes. I didn't quite get that piece.
Nicole: We're both in Worcester working
Jennifer: I'm glad you're here
Nicole: WIll, do you want to start us off?
Will: Yeah, sure. Of course. Um, so one thing, thank you, especially for like coming to, you know, talk with us. We like really appreciate it. Um, I for one, I'm actually like, really interested in learning about like, sort of this like seminar and your experience with education. Um, so actually, really to start us off what is sort of as like an educator, what's your experience with education in general like how long have you been teaching and like, what kind of like certifications Have you like or degree in teaching or anything sort of, of that nature?
Jennifer: I was in the corporate world for about 10 years. I stayed home with my children for about 10. And then I got my master's degree in education at Roger Williams University. And I've been in education for about 10, well, it's been 12 years actually. So I didn't have any undergrad degrees in education. I got my Masters of Arts in Teaching for Elementary Ed. So I'm certified K through six regular ed. And I taught for two years in a public school in East Greenwich. And then the last 10 years. I've been at Our Lady of Mercy which is a private Catholic school.

Ironically, it's literally across the street from where I taught. And Our Lady of Mercy is in East Greenwich, Rhode Island.
Nicole: So our next question is, are you on like currently preparing to run more online courses? Or have you run online classes in the past six months?
Jennifer: So I have never run a class? I am. I wouldn't say that, you know, if I were to describe myself in terms of my abilities in technology, I would say I'm average, maybe above average. I'm certainly I'm not a novice, but I am far from an expert. So yes, I have already incorporated in the four days that we've been back at school. A couple of the platforms that I'm going to want our children to use Because I'm anticipating that we will be full distance learning. I'm trying not to be pessimistic, but realistic. So, and certainly the pandemic and us leaving school in March just threw us into deep waters. So it was kind of crazy trying to pull all that together.
Will: So, so to so just to like clarify, would you say that? So, like, pre pandemic, did you ever use online sort of education before? Or is it sort of with the rise of pandemic is that what really is sort of pushed?
Jennifer: You know, I mean, it kind of I guess it depends on how you define online education. So were there programs that we used? Yes. Certain we were up on Google Classroom, so at least my children were very familiar with that. In I teach fifth grade. So with that, they they type and they look at their doc. But I usually print it and give it back to them. Because I find that they have difficulty reading my edits that I put on the side and then going back and editing it on the computer. So they use it, you know, a simple doc to type something, but then I kind of print it out. And within Google Classroom, I actually, in addition to Google Classroom, I have my own website, which I love. I love my website. And I've had a website since I began teaching so it's kind of evolved over 12 years. And on that website, there are various topics and research and links for the children to use and we do use that in class as well. So I don't know if you want me to go into detail with with that or to?
Will: Yeah by all means. I mean hosting an actual website, directly like that that's something we are looking for.
Jennifer: Yeah, but and you can you can access it because it's, it's on the web. So all you've got to do is go to, olmschool.org and that will bring up bring you to Our Lady of mercy website. And then if you click down on the left hand side about us, you'll go down to faculty, you'll find my lovely picture and my my link to my website so that'll give you a bit more insight as to what I've actually got on it. But of course, very general overview of it would be just some simple resources for the children in the event they forget something at school so you know the the reading log or whatnot. But there are links to specific periodicals or magazines. That I have them use for a current events assignment that we do. They do 15 over the course of the year. So they're able to click on the link and get to what I feel are appropriate assignments for them. I've also got links to in fifth grade, we we read a specific set of 20 books in Rhode Island that have been voted on by their librarians, and that changes every year. So that link brings them to that their trailers on it, it's a really good way for for them to gather interest on the books that I would encourage them to read that I know are different genres and very good literature because the librarians from Rhode

Island voted on it. There are also because we're a Catholic school. We have something called virtues of practice, and it is a virtue of the month and so the online program is right there for them so the parents can access it as well. And then just some links that go along with our curriculum. We have Greek and Latin roots. So they can they can access the online website for that, or the vocabulary and grammar, the online, they have quizzes, they have games that they can play with the words, just a different way of reinforcing the skills. So I will give that to them at times. What else do I have on that? Oh, then I have all content. So like for social studies, we read a few novels, number of the stars is one of them. And we do web quests. So on. on that piece number, the stars. The link is there and they have different assignments on the webquest. So that brings them to it. There's also a background. It's age appropriate for Hitler and not the you know, the Nazi invasion and whatnot. So we can go over that or they can go back John Smith, we study the colonies and the settlements of the colonies. So blood on the river is a fantastic historical fiction book that goes along with our curriculum. And it has I have on there different websites that some of them are fun, you know, cartoonish where john smith is coming over to Jamestown. Some of them are a bit more academic in nature because they need to do an online report. That's, it's not a PowerPoint, but it's it's similar to that and they need to conduct research on that. So I give them specific links to that of for math, we use a program that's pretty popular IXL. And that reinforces a specific math skill. I mean, I think they have in fifth grade, something like 450 specific math skills. So I can differentiate that way too, which I can talk about later, but Class I do that. So I might assign an IXL for them. So they can hit it, or Quizlet is another program that I use that's on my website that its vocabulary. They make their own Quizlet sets. And I, because of my teacher account can see them and they have different things that they need to do with that. So they're probably about my website. But that's pretty much what I can remember at this moment.

Nicole: So how long have you been like implementing this online platform like the website, design?

Jennifer: Tthe website I've had since I started teaching, so I create, it was not a requirement where I was. So I had my own website for about seven years, I'd say, and I had to use different platforms. And then once at some point at OLM, they required it And I had to use Google for that, which I wasn't thrilled about, because then I had to take all my content from my old one, and put it on my new one. So if you scroll down, you will see when you go to oLM, all the teachers websites and they vary, you know, some put pictures up. If it's primary, then they've maybe got a newsletter on there. So if you're looking for some examples of different websites from teachers and various grades, because we're pre K to eight, that might be a good resource for you.

Nicole; Thank you, yeah. So obviously, you're using this website to distribute your content to the students. But do you also use anything like Google classroom as well in addition to it, or is it just solely through this one?

Jennifer: No, we we use Google classroom and so now Google Classroom kind of trumping my website at this moment, which I'm not overly thrilled about, I gotta be honest. So I'm making

sure that my kids have already bookmarked my website, we've already gone. It's only been four days of school, but they bought on the rooster game, the rooster books, because I want them to act, they're going to have to access my own website for things that we do in class or things that I expect them to do at home. Google Classroom is is in addition to my website, but at this point in time, it's become critical because of distance learning and where we are in the world with the pandemic. So there are I actually had them go on Google Classroom this summer. I put all of my summer work on google classroom, so they at the end of the year, your mom actually Mrs. Racca made OLM student accounts for them and they were able to I was able to communicate with them. So they had the Google Classroom code. And I also used Google Forms for seven different math assignments. And they were grouped by the strand of math. And what's great about Google Forms, is that a correct fit for you. So I was able, I don't have to correct all that they had to write down, I needed to see their work. So when they came in, I needed to actually see that they had worked these out. But it gave me a really good snapshot of where they are. And it was easy for me because I didn't have to correct it. And I have it online, so I'm never going to use it. So they actually got on my Google Classroom in June. I also put up my summer reading assignment there which was all online, so it had different options. There were 13 different options in related to the book that we read over the summer, which was Wonder, and they could pick six. But again, that was online. So they're submitting it to me through Google Classroom. So when they came into me, they already had, you know, some pretty good exposure to my, or I should say, our Google Classroom.

Will: So what are some I know, we talked at least a little bit about, like, the content itself that is already sort of on your site. But we, I'm curious to know sort of about, what are some examples of like, well, how should I phrase this question like? What are sort of certain like new practices that you've more recently discovered in light of, you know, this pandemic that you want to use in relation to the content that you make, like the educational content?

Jennifer:so that's where the professional development that I took was awesome. And in the event, You want to attend that seminar. She's having them again in October. It's through the bureau of edge, bureau of education and research, I think what is what it is I can send you the link, but it is the best PD in my 12 years of teaching than I've ever been to. So it's a webinar and it lasted from 830 to 330. But when I tell you it was packed with information, and I believe Mrs. Rocca sent you the handbook in the PowerPoint. If she didn't, I will send it to you. But that's where I got exposed. I was probably exposed to 12 different flat platforms, and I only maybe knew one of them. So because of that PD, I now have so I actually already have an assignment online, but we're going to do it in class flipgrid, which I don't know if you're familiar with that at all. But flipgrid is great, because they actually videotape themselves, and I get to see it before, you know was published to the class. But you can do an awful lot with that, like in terms of summarizing a book you can differentiate. So the kids when you put it together, if it especially if it's distance learning, they can they can understand different points of view or different, you know, inferences that students might make about a book. The first, the first lesson that we will do together is an all about me project. So I was able to upload some graphic organizers to flipgrid

and I have a model as well. And I have a video of myself, which is lovely. So they know exactly what to do organizers pretty straightforward, and it has text boxes in it. So they bullet the first organizer, you know, tell me about you how old you What are your interests? Do you have any siblings? There's some specific questions there that they need to answer. And then they take that. And they put they write a script from it. And again, I've modeled that for them. And that script is going to be what they read when they videotape themselves. The video tape I did, it's a little bit long, but I thought for the first one, I'd rather err on the side of caution. So they have five minutes, they can take two, but I just didn't want it to cut them off. So they'll complete that I get to see it before I post it to the class. And then that will be one of our assignments where each night or during class will view like three or four of them together. So it's a great way at the beginning of the year for students to get to know each other, especially if you're just learning right off the bat. And it's exposing them to the Flipgrid platform. And because we're In school, we can learn it together because I do plan on using it. When, if and when we're distance learning and even not I'll use it in class. So flipgrid is definitely one. What I had used, I was familiar with this one is explain everything. And that flipgrid is free. Explain Everything I think is like $5 a month. But what I liked about it, especially with math, I got it. I have an iPad, I actually bought it specifically for distance learning. And I also have a stylus pen and what I can do for math lessons, I appreciate that they hear my voice, they see exactly what we're doing. So it's, you know, I'll do the screen, different colors, explain it, then I can do another screen. I keep it short. I keep it like four minutes. It just kind of gives them a preview as to what we're going to talk about that day. So it's not it's really just like an exposure to what we're going to be doing for the day. I do give them a couple questions at the end to try to have them answer and then I and then I provide the answers. So explain everything I really like and I, I exclusively used it for math. I was also exposed to something called Canva, during the professional development that was brand new to me, that you can make like posters. And I liked it because it's collaborative. So you could make your own poster or you could have a partner and the two of you are collaborating and making the poster together. And the first one that they're going to do is about Coronavirus. So, there's a model and for that one, I probably will just have them find like maybe a picture and superimpose it to the picture. That's awesome. They're so they're probably going to follow the outline that's there for the poster first, and something that you know, some content that's certainly very relevant to their lives and what's going on today. And then as we proceed, that's something that that I think is fun. I think it's creative. And it's just a different way of showing your knowledge. So Canva is free, you could pay for it and get some bells and whistles, but as a teacher really wants to do that. Not me. Anyway. Um, another program that I was exposed to is called screencastify. That I knew about but I'd never used so that's basically recording yourself. It would be you know, during a live lesson and you can have the screen up and you can be in the corner. So they see your face. They see you Talking and you're able to basically share your screen. And I liked that because again, I'm on there, they can pop up, I can see their face, they can ask a question. And they hear my voice. So it's just, it's kind of like zooming I guess when you share a screen, except they can see your face. I liked that. Um, the was it screencastify? Or

was it there was another one and I don't think it's called screencastify where you can take your document camera, and you know, just turn it. I guess it would be screencastify. If you've got a webcam, turn it and then all of a sudden it is an overhead projector that you can now Yeah, right on. So you're going to write a summary. Here's the main idea and they actually see you doing that. So that's something so simple, but I would have never thought of that. Another thing I was exposed to that is a fun thing. I not necessarily using it right now, but this I probably would only do with distance learning. I think it's a little primary for fifth grade, but it's a bitmoji classroom. So I already I've created it. And my bitmoji is so cute, she looks just like me. But it's got hyperlinks there. So in the morning, you know, you could put on the board, I my classroom happens to have a little board, you know, you could put what's going on for the day. Um, I had a plant, let's say you're doing plant cells or something you can hyperlink to a to the plant cells and it brings it to them. It's just, it's fun. It's different. So they would totally be into that. The other thing again, really simple as emoji keyboard so I now when I'm typing or doing Anything I can use the fun emojis or my bitmoji. And it just makes it that, you know, they identify with that because of all the texting and you know, it's going to keep their attention. What other things have I done? So I learned what the screencastify. Oh, one other thing I learned in that and I think that might this might be a question like later on, but, um, differentiating is really hard when you distance learn. It's really, really hard to do. And I am not an expert on google classroom or Google Forms, I'm getting better. But this was just like mind blowing to me when you make a form and if you're going to make it like a quiz, it's really just hitting a different button. And it's similar to like a star assessment in the sense that if you have two plus two, and Susie gets four, she moves on to a harder problem like that the next step in that maybe like 10 plus four, two digit plus one digit now with Johnny doesn't get two plus two is four, you can put a whole other strand on that. Where it now gives him an easy question, again, an easy question again. And now you go to the harder questions. So it differentiates by making two different quizzes for the learners who have either you know, they're mastering the skill, they're getting close to mastering the skill or those learners that are still struggling with it. So I learned that as well in the professional development, and then there are a few things that like, I just know, I wouldn't use the ones that I just told you. Now I could wrap my head around and I could see How I would use it and I had some time in the summer to actually, you know, I've prepped lessons for it. So I already have a flipgrid a Canva. Lesson going, I've got my bitmoji classroom. So I felt pretty accomplished with that, again, the PD was just amazing. She was amazing. But there were 100 educators. She did it four times during that week. And there were 100 educators on the zoom, and from all over the country, I mean, and then she she had little breakout rooms in zoom, which you know, you can do, and so my breakout room had other fifth grade teachers. We had one from Monterey, California, somebody from Pennsylvania, somebody from Kansas. So it was really interesting just to talk to them to see what their methods were but specifically for for this time in our country, what their state's plans were or their towns plans were on distance learning and what was Like in September. All right, I'm gonna take a break and get some coffee, that was a long answer sorry.

Will: No worried, this is great! This is content we are looking for, thank you so much!
Nicole: We're just curious, um, when kind of the pandemic struck and everything what was like OLM, like plan in place, like, how did you guys do distance learning? Did you have synchronous lessons, asynchronous lessons? Like, how did you go about that?
Jennifer: Alright, so we obviously had no plan in place. So it was every teacher for themselves. It was crazy. And I mean, I seriously got no sleep. And I don't think any of my colleagues did either. It was it was really, really difficult. Synchronous learning, like all day long, I just, you know, there's no way that I could do asynchronous learning. At that point I think I could do it now, but I definitely couldn't do it that. So it was really, really difficult. Even just the most difficult thing about that, to be honest, was getting them the content. You know, I I would have I didn't have many, like Google slide assignments. I had things that I'd find online that I really liked the reading and I liked the questions, but then I had to take a, you know, take a picture of it, upload it, because it's PDF, then I had to put textboxes in so they could actually type the answers. I mean, it was it was bananas. So no, we had no place no plan. Google Classroom thank God, my children new Google Classroom. I had to That's when I learned how to organize it per topic. So that if they had assignment of science assignment, they would go to the science topic. I love my kids like so much. And I really miss them. And the most important thing to me during that time was for me to comfort them and for them not to be anxious. So what I would do, and again, this was challenging, is I would make a video of myself, I ended up with a YouTube channel. I mean, my boys were hilarious. They're like, Mom, I can't even believe I'm like, I know what is happening to me. And thank God I have older children. So they really helped me with a lot of this technology. So I feel for my colleagues who either had no older children at home or had babies because without my boys, I would have been up a creek but I would take a lesson I would tape just like a morning message. And I usually made it pretty funny. And I didn't care because in class like I'm very nurturing. I think I'm funny, but I don't know, you'd have to interview them. But I'm strict. Like, I definitely have expectations. When we're working. We're working, we are all business. And they I think they know when they respect that. So in the mornings, I would just give them a five minute, you know, hello, be funny, and then kind of prep them for the day like what we're doing today. So that when I met with them on zoom, they had an idea. And I already had on zoom, I'm sorry, I already had on google classroom, the whole outline for the day. And that was when you open Google Classroom. That's the stream. That's the first thing you come to. So I'm really varying from your question. I think But I am kind of explaining things. Is that okay?
Will: Yeah, of course.
Jennifer: Okay. So when when they opened google classroom, and you go to the stream, I would have the outline for the day I would have my video. And then I had, at the end of check, a daily checklist that they had that I would make every day in forms that they went through, and they had to check and say they did it. Or if they had questions, that's where they write their question. And many assignments I gave on Monday, they were due on Friday, so they give me Yeah, I'm working on it or no, I'm going to do it on Wednesday. So that was a good way for

them to make sure that they were doing all the work that they had to do and it was great way for me to answer questions for them if they didn't understand something. But at that point in time, if I had a science assignment you would have have to go in to another screen called classwork. And then you would have to go into another folder called science. And they had a hard time sometimes finding that. So when I did this professional development day, somebody, I don't know who it was made their folders just for the day. So, you know, Friday, September 11, and any assignment they had, that's where they go. And again, I just that organization to me is brilliant, but I hadn't thought of that. So I've already set that up with my kiddos so that they they know how it's organized. So if they're out, because we have some remote learners, we have distance learners or if there are any assignments that I'm having them do online that they need to do at night. That's where it is. It's in that folder. I don't even know how to go on that. But does that make any sense to you?

Will: Yeah of course

Nicole: So, um, I know you discuss that you're basically online synchronous learning. All day long during the pandemic, um, can you just give us like a rough estimate of like, maybe how many hours like what timeframe we kind of just on a zoom with your students?

Jennifer: Yes. So we, as a school, we had different hours per grade, because people have different students, different ages. So fifth grade, we were at nine o'clock. And the requirement was a half hour, 45 minutes. You can already tell I like to talk. So I would, and I taught science. So I ended up driving like All these microscopes dropping them off. And we actually did science with microscopes, because it was a microworlds unit distance learning. So those science lessons when I did them for really long, but they liked it because it was interactive. That was kind of hilarious, but they loved it. And they had to like slice an onion and put an onion under there. And we were looking at the plant cell and you know, all that kind of stuff. So my zooms and my math lesson, we did math every day. So math might go a little bit and then I did la every day. So I'm getting like, I didn't do science every day. I did science. Maybe twice a week. So my zooms were long. They're about an hour and a half. In one shot, nine to 1030. We had like a little break in there, but it wasn't a very long break. So, but the good thing was it was at nine o'clock. So they if they had questions or they're like Mrs. Nygren, and I just looked and you didn't put that on, I'm like, Oh my gosh, I didn't thank you for telling me I will put it on. They got all their questions answered. So I liked being on at nine o'clock, some, some people weren't on till like 11 or 1130. And I personally wouldn't like to that, but you get what you get.

Will: So if, if the process, at least when you're actually like, in time synchronizing with students is like, sort of on this timescale where it's like an hour and a half, sorry, not rF? Half an hour, excuse me, got the words mixed up there at the start of the day, um, what about when you For example, with like, flipgrid, right, a specific example, when you had to like create videos or create, like textboxes or something that the student would have to look into asynchronously or how To do sort of, in their own time, Mm hmm. How long did that type of content take to create?

Jennifer: Hours. I mean, hours, I didn't know what I was doing. So I'm teaching myself my boys are teaching me they were supposed to have and it was like, one of my favorite favorite assignments, or they choose somebody in history. And they it's called Who am I? And they read the biography. And then in first person, they tell who they are, but they never say their name. And they dress up like that person. And parents, grandparents, you name it, they come in, so the kid will come to me they like knock it out of the park. They love these costumes. I tell them don't buy them. Some do but the ones that are homemade are the best. Like Neil Armstrong, the kids literally had white trash bags. It was great. So they had already like that was in the works. We were supposed to have that a week after we went out. We went out on March 13. So I'm scrambling. And in talking to a friends, son, they told me about Dropbox. I didn't know what Dropbox was, I ended up getting a free trial. And then I had to add to it for like $200 but I got it back. So the kids videotaped themselves. Then they sent it to me. Then I had to download it to Dropbox. So everybody had to look at it through dropbox. I then sent the file to the parents so the parents could see it. But it was such a process. Now if I had flipgrid, it would have taken Like, I don't know, the 20th of the time, but I didn't know about flipgrid. So, if we were to do that, again, I know exactly what I'm doing. You know, creating text boxes, I am not doing that unless it is totally necessary because it's not hard to do. It's just like they're four steps in it's it just takes a long time. So I did get kind of smart Teachers Pay teacher's saved me. I spent about $250 on different distance learning assignments. But I do it all over again. A lot of them were Google Slides. And it had content along with it. And then they'd have to create the Google slide but everything was done for me the textboxes were there I liked the content. If I didn't, I could edit it. They were all editable, then it was sent to me really easy. So I did get quite a few Google Slides and I might assign it on a Monday and it was due on a Friday and we discussed it as they went along. That I would do and I and I saved quite a bit of that. Um, other than any and teachers take pay teachers, as I said, did have some great stuff. Some of it I had to convert, which took a long time. So if it were to happen again, I think I'm in a much better places. Don't get me wrong, it's going to take me longer than it necessary than it would but it's not going to be near the amount of time i don't i don't think.

Nicole: so, um, if you have any resources or even like, if you can think of any resources on whether it be like they would like to learn whether it be online Like physical, like, equipment on that would help maybe alleviate some of the challenges of creating your content. Is there any that like, you can think of maybe if you wanted to learn?

Jennifer: Yeah. So I do use Kahoot in class, and they really, really love that. Like, that's a great I use that for review. So I do have, I have a lot of blood on the river that that novel, and many of them are already created. So I just search for other teachers who have created it, and then I can modify it the way I want to modify it. So yeah, I kind of forgot to tell you about that. Yes, I do use Kahoot. I don't. Right now. Um, I got exposed to so many different platforms in that PD. That my mind is spinning a little bit. And I feel like she exposed me to really a variety of like the latest greatest. So in time, maybe I'll go back and look at some of those others. But I've got about five that I'm working on right now. And that's more than enough for me.

Will: So, let's talk. Um, let's narrow in and be a bit specific about so when you're trying to communicate with students, right? Either like it's done like Google through words through Google Classroom or emails or forums or like anything of that nature, you know, trying to like still keep in touch with them. Even the video that you created a first because you delve into a little bit about what are sort of the challenge Does that come with trying to commute communicate with students like in this way.
Jennifer: So one thing that made initially, we, the children in fifth grade did not have access to emailing. And they would use their school account for different things to get into but they couldn't receive emails and they couldn't email. So at the beginning of distance learning, I'm emailing the parent, if there's something I want the child to do, very difficult. So soon thereafter, Mrs. Raka was able to enable fifth graders to email me that was a lifesaver. So now I'm going directly to the student. Now we we did have to revisit email etiquette because some of them were just like I don't get it. I'm like, Okay, can you say Hi, this is Nygren. I don't understand this. But it was a great way for us to communicate to each other. Um, it's, again, it's challenging throwing a nail to number one, assess a student's anxiety level over something that they're not learning or I'm just very confused about through an email. So sometimes the parent would email me I can see that in the classroom, obviously, but distance learning I can't. So the parent might email me. I also gave my phone number my my cell phone to all the parents and just said, Call me if you need me. And so some took me up on that some just emailed me some texted me. You know Harry, he's having a really hard time. He's so anxious. He's overwhelmed. So I just call him on the phone. That's that's the way I roll. And and we just we would talk it out and be like Harry, take it down a notch. I'm not worried about this, you shouldn't be worried about this. So I actually resorted to talking to the kids on the phone, the ones that really needed me. And some of them freaked out over that, like, Oh my gosh, she's on the phone. I don't know what to say. So I had to get through that a little bit, but it's a challenge communicating with them. I think just so much gets lost in email anyway. And as I said, it was very challenging to give feedback on like a writing assignment. That's really tough, because I can, you know, if a child's having run on sentences, all right, well, now I'm going to have to Tell them where they need to look. And then they might look and not see it. All right that that's really hard to work with a student on that or a specific math skill you know, they're going to get really frustrated so that sometimes when I zoomed with kids with the class I would I'd actually when I saw their homework and I saw they didn't get it I'd be like Sally just stay on with me for a couple minutes when when we end so I would zoom with those children that I needed to communicate more with privately or in a group or whatever it might be.
Will: off the back of like, especially when like a student is like us struggling like with something what what exactly would be in more detail your methods for ascertaining how much the student has learned. Because you mentioned that, like, if they're struggling, then you'll be able to like call and talk with them on the phone. But how would you know?
Jennifer: Um, through through distance learning not in the classroom? You mean, virtually? How would I know? virtually, I can just see with their what writing assignment, if they're not

comprehending it if they're gonna write a summary, or they need to give me the main idea and details and they're not even close, what's pretty apparent to me that they're having a hard time and that is, if they are not comprehending the text. I need to speak with that there is no way I can do that by typing back and forth or emailing. with math, it's a little bit more straightforward because well, I take that I take that back because some parents actually distance learning will just feed the kids the answers and so I will I know that because when we zoomed it, and they had to do the questions themselves, like right in front of me with math, and then show me on their whiteboards, I'm seeing the kids that are not getting it, but oh my gosh, on their homework, they totally got it. So that's another way I could assess in real time, if it was their own work, or their parents work. And I really, I didn't, I didn't assign grades for distance learning, because I number one, I thought it would not be valid. And number two, more importantly, I didn't want the kids really anxious about it, because if they get a 70, they're gonna freak out, especially in my school. There's like a healthy competition, but sometimes the parents are really demanding. And they get an 85 and they're crying, you know, so I didn't want to put that extra stress on them, this time with distance learning. If we're going to go out again, I'm going to have To change that policy, but and I'm not quite sure how I'm going to do that. But it was, it's not that hard. I know it sounds hard for you to see that child's not getting it, but it's really not. And you also know, the learner. You know who where their strengths are, and where, you know, they need support. So I'm going to keep my eye out for these three in comprehension, because I know they're going to have a hard time with it.

Nicole: So going back to this, like professional development on how do you other than just like on adding in these new resources? How do you think this PD is going to just like change your online content? Do you think like the students are Going to like appreciate the new platforms that you're incorporating or excited?

Jennifer: Yet, I haven't even really exposed them to a lot of it yet. So the first few weeks of school are going to look very different than they have in the past because I want to practice with them, how to navigate the different platforms, so that if and when they're doing it independently, they know how to use it. I do think they're going to be excited about it. They can also like do podcasts and there's really something for everybody. And I think they're going to enjoy it. I do because it's, it's different from the norm. And a lot of it is now aligned to I mean, really the way these kids think and interact. I mean, it's just it's more technologically based and and that's the way their brain is wired. So I think educationally, I'm still very much into you know, Books and writing and a lot of the traditional type of teaching and learning but I think there's a lot to be said for incorporating technology every day into your teaching and into their learning because I think they grasp it better.

Will: Well sort of, it's bit more of like a personal opinion question of you, but like as an educator, do you believe that this sort of like, online education is going to still be like as successful as in person education with your students specifically, or even just like in general?

Jennifer: Absolutely not. It's not even close. Not even close. So you don't have to didn't contact you don't have that interaction You don't? Absolutely. It I feel really badly for these kids. I feel

badly for my kids who are in college. Some kids just think they just don't learn this way. And it stinks, so no.

Nicole: So, um, just to kind of go off that say like seeing that you have two kids in college, like as a parent Do you find that your children are working through like the virtual learning as well like, are they kind of grasping the content as they might have in the classroom? Like what's then your opinion as a parent as well?

Jennifer: Okay, so number one, I lied. I actually my baby just went to college. So I have three in college I forgot that he's a freshman. So um, because they were all home during the pandemic, I saw the distance learning in depending on what school they were at, and Depending on the professor it it really varied. One of my children is very much a hands on learner. And he he was able to learn in time how to advocate for himself and he. He's done great in school. He's now a senior, but he would also even in college kind of seek out tutors to meet one on one and go over concepts. He would meet with his professors. So, the fact that he can't do that is really stressing him out. Because he is not this type of learner. You know, another one of my children. Teachers just fine with it. You know, he didn't like it. But he was able to learn that way. And then one of my children that was in high school. Again, no school knew what they were doing right. And that demographic of high school is not an easy one to control. So that zooming I it was just kind of like, kids were their kids weren't there they were, I don't know muting the teacher like, they were able to figure all these things out. So, I just feel as a parent, and you guys are in college, I mean, my heart breaks for you. It really does, because it's not the way it's supposed to be. So it's not hopefully it'll, it'll change in the spring. I'm trying to be optimistic.

Will: One thing, Nicole and I really want to thank you all like, thank you so much for like talking taking the time to talk to us we like really appreciate it like this especially like, of all the things that you've learned, especially like firsthand through this has been like very, very informative. So we really do appreciate you taking the time to talk with us. Do you have any questions for us about what we're doing or or any sort of extra like comments or anything else about your experience?

Jennifer: Yeah, well, what's your major? And what are the requirements of this class?

Will: Oh, well, so I'm a, I'm a physics and math major. I'm the, I don't know Nicole if you want to say your major or if I should just talk requirements.

Nicole: Okay, so I'm a biomedical engineering major. So I'm in the junior year. You have you like are supposed to go away and do a project to benefit like a different community, normally on kind of lesser developed communities and countries. So on normally we would go abroad and we'd go work down in Panama with this corporation kind of doing the same project on there. Um, and really just the requirement is, we do a ton of research, even some like social science style research, and we gather the data and produce a deliverable. So our deliverable is this like online platform to help teachers learn how to incorporate some more virtual aspects into whether it is their like direct classroom or their virtual classroom. And so that's really what we're working on from here till about the middle of October, we'll be kind of developing those guidelines,

recommendations, tutorials, and then kind of making a mock up prototype website. For this corporation down in Panama to then produce.
Jennifer: So would you have done this same topic if you were in Panama?
Will: We actually originally our project back during sort of the end of the previous academic year, the project that they're discussing that they wanted to do is they wanted to create a, a sort of kid's like learning museum for STEM education, where like it would be, sort of a building, they had like a warehouse set up and everything that we'd go and we'd like help design certain exhibits and a activities, like a kid could go in and say like, Oh, I'm going to go to this like exhibit in the museum to learn about the different kinds of clouds and how the weather cycle works. Or I could go to this part and learn about like, cells and things of that nature. So yeah, it's a, it's fairly different from what we're doing now.
Nicole: Yeah, a few weeks after even just starting getting that project back in March, about two weeks later, when we reached out to our sponsor project was completely different. At that point, we were then supposed to be developing, like a common facility for teachers to go where they can go create this virtual content on. And then later on, you know, two more projects down the line here, after actually working for seven weeks ahead of time on a whole different project.
Jennifer: Well, you're gonna be very knowledgeable in different subjects. Look at it like that. Oh, well, I wish you both the best I do.
Nicole: Thank you so much. I really appreciate you talking to us today, and we will be in contact soon with the transcript after it's created. Well, thank you so much. Really appreciate this.
Jennifer: Anything let me let me know bye bye!

Appendix H: Densis Hernandez Interview Transcript

Introduction:

Hello, we are Nicole Racca and William Aaron, two undergraduate students from Worcester Polytechnic Institute (a university in Massachusetts) who work with Fundesteam Corporation in Panama City, Panama for our Inter-Qualifying Project. Our project is to create tutorials and resource packs for creating virtual learning content, in order to help educators adapt to this new wave of online education. We would like to interview you about your experiences with online learning.

Date: September 16, 2020

Interviewed: Densis Roniel Hernández

Professional Title: Bachelor of Mathematics, Secondary Teacher, Postgraduate in Difficulties in Mathematics

Any information you share with us may be completely confidential and will only be used for research purposes with your permission. We will not identify you by name in any of our writing if you do not consent to being cited. If you prefer not to quote, you have the option to remain anonymous.

Consent questions: Yes No

Do you prefer to keep it confidential or can we use your name on our report? No
Would you like us to share our work with you once it is finished? Yes

If we ask you a question that you don't want to answer, feel free to skip it.

Interview Questions:

Question: What is your level of experience with education in general? (i.e., how long have you been teaching? Do you have any certifications or degrees in teaching?)

Response:
15 years in education, both public and private. Teaching staff in secondary education with a specialization in Mathematics.

Question: Are you currently teaching online classes for education or have you taught online in the last six months?

Response: In the private system since March and in the public system at the end of July.

Question: How long have you been using online education? How long was your most recent time of teaching online?

Response: An online period of 200 minutes a day in private. In the public less time due to the little connectivity.

Question: Through what process is your content distributed to students?

Response: Share documents in real time, forms, emails, software applications online.

Question: What age groups did you teach when teaching online, what demographic?

Response:7th to 10th grade students.

Question: What subject or subjects did you teach during this time period?

Response: Maths and physics.

Question: What are some examples of the types of content you have created for online education on this topic? (i.e. live lectures, videos, articles, interactive applications)

Response: I have used geogebra apps, microsoft forms test designs, and khan academy.

Question: Describe your typical "lesson" in this context.

Response: Who practices, studies twice.

Question: What aspects of your online learning content, if any, involved asynchronous learning?

Response:
In these subjects, learning must be in real time, so that students can interact with each other with each strategy that each one could implement in solving problems, for this telegram channels are

used to share their problem solved, explaining to through shared videos of explanations so that they can guide each other.

Question: What aspects of your online learning content, if any, involved synchronous learning?

Response: In the case of theory, in general, many times they do not need to be explained, because it is understood and is easy to understand and handle.

Question: What is your process to prepare for creating your online learning content? How long does this process take on average?

Response: Prepare a document in real time, sometimes a couple of hours (2hrs), but as it is in real time as a specialist I must be prepared at the moment for any doubt that was not planned. For that digital whiteboards such as jamboard, Microsoft whiteboard are used.

Question: What, if anything, works well with creating your content online?

Response: Everything must work well when you plan it and they find their solution, as it is in real time you must be able to solve problems even if you have not planned it, for that I must be prepared.

Question: What are the resources that you regularly use to create this successful eLearning content?

Response: He used khan academy, jamborad, virtual textbooks, as well as very common math software.

Question: What, if anything, are some of the challenges you face when creating online learning content?

Response: If they are poorly prepared, there is a lot of confusion in the student and the other is jaking information to be copied. That is fashionable according to artificial intelligence.

Question: Can you think of a resource that, if you had access to it, would help alleviate some of the challenges of creating content online?

Response: I think maybe to do different exercises for the boys, so that the copy is minimal, but this in technology has good things and also bad things.

Question: How do you communicate with your students? Either / both synchronously or asynchronously?

Response: Video calls by zoom, meet and activities by khan academy.

Question: What, if anything, works well with your communication with students?

Response: Sometimes you have problems in the connectivity system, bad signal and problems in your devices.

Question: What are some of the challenges you face when communicating with students?

Response: Finding initiative in them, but I see that youth do not take advantage of the benefits of access to information, we must cultivate this generation, I always remember Albert Eintein's phrase, technology would make man mediocre, if it takes over everything.

Question: What is your method of determining how much a student has learned?

Response: Oral questions and interrogations.

Question: As an educator, do you believe that online education is successful in teaching your students specifically? Do you think you are successful in general?

Response: It all depends on the will of the human being to want to learn by his own means.

Conclusion:
The challenge now is to create a virtual curriculum for virtual education focused on our educational system.

Thank you very much for taking the time to send us responses and participate in our research..

Is there anything else we haven't talked about yet that you would like to cover?

If you have anything else you would like to add, you can contact us at the email address gr-fsteam20@wpi.edu. Thanks for your time.

Appendix I: Jorge Hernández Huerta Interview Transcript

Introduction:

Hello, we are Nicole Racca and William Aaron, two undergraduate students from Worcester Polytechnic Institute (a university in Massachusetts) who work with Fundesteam Corporation in Panama City, Panama for our Inter-Qualifying Project. Our project is to create tutorials and resource packs for creating virtual learning content, in order to help educators adapt to this new wave of online education. We would like to interview you about your experiences with online learning.

Date: _22-09-2020_____

Interviewee: __Jorge Hernández Huerta_____

Job Title: __Certified Public Accountant_____

Any information you share with us may be completely confidential and will only be used for research purposes with your permission. We will not identify you by name in any of our writing if you do not consent to being cited. If you prefer not to quote, you have the option to remain anonymous.

Questions of Consent:	**Yes**	**No**
Do you prefer to keep it confidential or can we use your name in our report?	Yes	
Would you like us to share our work with you once it is finished?	Yes	

If we ask you a question that you don't want to answer, feel free to skip it.

Interview Questions:

Question: What is your level of experience with education in general? (i.e., how long have you been teaching? Do you have any certifications or degrees in teaching?)

Response: In 2013 I was certified by the LEGO® Academy to teach with its materials.

Question: Are you currently teaching online classes for education or have you taught online in the last six months?

Response: Yes, since the pandemic started I have taught online classes from Monday to Saturday.

Question: How long have you been using online education? How long was your most recent time of teaching online?

Response: March to date.

Question: Through what process is your content distributed to students?

Response: Anything that needs to be sent to students is by mail.

Question: What age groups did you teach when teaching online, what demographic?

Response: 11-15 years

Question: What subject or subjects did you teach during this time period?

Response: Educational Robotics

Question: What are some examples of the types of content you have created for online education on this topic? (i.e. live lectures, videos, articles, interactive applications)

Response: I had to coordinate bringing robots and training tracks to my house to continue with the courses, and months later we implemented a virtual robotics simulator and in that way we continued learning for the children.

Question: Describe your typical "lesson" in this context.

Response: At this time it has changed a bit since the boys have started practice for a tournament with the simulator, so now we talk before the session if they want to practice with a physical robot or with a virtual robot.
The last training was with a virtual robot, therefore the boys were building a digital robot and I

was guiding them in what they should use and that it is not recommended.

Question: What aspects of your online learning content, if any, involved asynchronous learning?

Response: Yes, we worked the simulator with the boys first with weekly challenges, so they had 7 days to solve it and send them the results.
Although there were doubt sessions a week, it was not mandatory for them to connect.

Question: What aspects of your online learning content, if any, involved synchronous learning?

Response: Fixed trainings with the physical robot are in this way since they are more complex challenges and there is always a coach in practice.

Question: What is your process to prepare for creating your online learning content? How long does this process take on average?

Response: It depends on which one, because the simulator for a week we not only prepared the challenge for our children, we launched it in a competition portal for everyone, so it takes us several hours to develop it.
The physicist does not take so long since you only have to have the material ready and in some cases anticipate to prepare some programming question that will be seen during the session.

Question: What, if anything, works well with creating your content online?

Response: Yes, the parents have continued with the courses and are grateful for always looking for ways for the children to continue learning and I think the most applauded by parents has been Virtual Robotics Toolkit.
For the students it was difficult to go to a simulator but what has helped them like it are the competitions at www.robotvirtualgames.com

Question: What are the resources that you regularly use to create this successful eLearning content?

Response: Zoom, Virtual Robotics Toolkit, EV3 Mindstorms, and email.

Question: What, if anything, are some of the challenges you face when creating online learning content?

Response: Well, you should seek to attract the attention of students since even at this moment many are fed up with taking classes online.

Question: Can you think of a resource that, if you had access to it, would help alleviate some of the challenges of creating content online?

Response: At the moment, I think we are looking to have the best tools available.

Question: How do you communicate with your students? Either / both synchronously or asynchronously?

Response: Synchronous and asynchronous

Question: What, if anything, works well with your communication with students?

Response: Well, since I have elementary school children, it is more complicated for them to pay attention to the communications by mail so in the sessions it is better to tell them things.

Question: What are some of the challenges you face when communicating with students?

Response: That they do not yet have that sense of responsibility and it is a process to introduce them to the fact that they must be more attentive and more responsible to what is sent or not activities.

Question: What is your method of determining how much a student has learned?

Response: Through challenges.

Question: As an educator, do you believe that online education is successful in teaching your students specifically? Do you think you are successful in general?

Response: I think that if it has worked and something that helps a lot is to introduce new things and skills, since the students due to the pandemic no longer want to continue taking everything online.

Conclusion:

Thank you very much for taking the time to send us responses and participate in our research.

Is there anything else we haven't talked about yet that you would like to cover?

If you have anything else you would like to add, you can contact us at the email address gr-fsteam20@wpi.edu. Thanks for your time.

Appendix J: Interview Analysis Coding Process Spreadsheets

J.1: Services/Techniques

	A	B	C	D	E	F	G	H	I	J
1		Alex	Victor	Gianna	Michael	Jennifer	Densis	Jorge	Type	Number of Mentions
2	Canva		x	x		x			Service	3
3	Coursera	x							Service	1
4	Drawpunto.io		x						Service	1
5	DropBox					x			Service	1
6	Edgenuity			x					Service	1
7	Email					x		x	Service	2
8	Explain Everything					x			Service	1
9	Flipgrid					x			Service	1
10	Geogebra						x		Service	1
11	Google Classroom	x				x			Service	2
12	Google Forms					x			Service	1
13	Google Jamboard						x		Service	1
14	Google Meets	x		x	x	x	x		Service	5
15	Google Sites					x			Service	1
16	Hour of Code		x						Service	1
17	IXL			x		x			Service	2
18	Kahoot	x	x		x	x			Service	4
19	Khan Academy			x			x		Service	2
20	Lego Digital Designer	x							Service	1
21	Microsoft Forms						x		Service	1
22	Microsoft Teams	x							Service	1
23	Microsoft Whiteboard						x		Service	1
24	Mindstorms	x						x	Service	2
25	Miro		x						Service	1
26	Moodle	x	x						Service	2
27	Pinterest			x					Service	1
28	Power Point				x	x			Service	2
29	Promethium Board				x				Service	1
30	Quizlet					x			Service	1
31	Screencastify	x				x			Service	2
32	Teachers Pay Teachers			x		x			Service	2
33	Tiktok				x				Service	1
34	Vocabulary.com			x					Service	1
35	Zoom	x			x		x	x	Service	4
36	Brief Highlight Videos				x				Technique	1
37	Chalk Board				x				Technique	1
38	Discussion Board				x				Technique	1
39	Document Cam				x				Technique	1
40	Flip Classroom	x							Technique	1
41	Gamification	x	x						Technique	2
42	Lighting	x							Technique	1
43	Old Fashion Maps				x				Technique	1
44	Online Text Books				x				Technique	1
45	Premade Videos (AP, etc.)				x				Technique	1
46	Recording Videos on Phone	x			x	x			Technique	3
47	Screensharing	x	x						Technique	2
48	Virtual Robot Games	x	x					x	Technique	3

J.2: Issues/Challenges

	A	B	C	D	E	F	G	H	I
1		Alex	Victor	Gianna	Michael	Jennifer	Densis	Jorge	Number of Mentions
2	Audio Not Working	x							1
3	Broken equipment				x				1
4	Camera's Off				x				1
5	Connectivity Issues						x		1
6	Content creation time-consuming				x	x		x	3
7	Frustration with material			x		x			2
8	Lack of equipment	x							1
9	Limited equipment, must share			x					1
10	Maintaining student's attention			x	x	x	x	x	5
11	Student Communication with Email					x		x	2
12	Student must work job			x	x				2
13	Student participation				x				1
14	Students Absent	x							1
15	Students Falling Asleep	x							1
16	Students unfamiliar with software	x			x				2

J.3: Opinions

	A	B	C	D	E	F	G	H	I
1		Alex	Victor	Gianna	Michael	Jennifer	Densis	Jorge	Number of Mentions
2	Appreciates collaboration with other educators					x			1
3	Difficult to use synchronous learning with young children					x			1
4	Dislike use of Google classroom over use of personal site					x			1
5	Educator is resistent to changing technology				x		x		2
6	History and some other courses might move virtually easier than sciences or math				x				1
7	Incentives are necessary but hard to give online			x					1
8	Maintaining student attention is tough				x		x		2
9	Newer Teachers have a harder time narrowing content				x				1
10	Some teachers assigned too much busy work because of the move to virtual learning				x				1
11	Students were at least learning the minimum requirements				x				1
12	Their experience in the move to virtual learning was more postive than negative				x				1
13	Universal Difficulties with Virtual Learning lowering grades/ need new expectations					x			1
14	Virtual learning can introduce new material before traditional classroom learning				x				1
15	Virtual Learning is not as effective as traditional learning			x	x	x	x		4

Appendix K: Services and Tools URLS Table

Service	URL
Canva	https://www.canva.com/
Coursera	https://www.coursera.org/
DropBox	https://www.dropbox.com/
Edgenuity	https://www.edgenuity.com/
Explain Everything	https://explaineverything.com/
Flipgrid	https://flipgrid.com/
Geogebra	https://www.geogebra.org/?lang=en
Google Classroom	https://classroom.google.com/
Google Forms	https://www.google.com/forms/about/
Google Jamboard	https://edu.google.com/products/jamboard/
Google Meets	https://meet.google.com/
Google Sites	https://sites.google.com/
Hour of Code	https://hourofcode.com/
IXL	https://www.ixl.com/
Kahoot	https://kahoot.com/
Khan Academy	https://www.khanacademy.org/
Lego Digital Designer	https://www.lego.com/en-us/ldd
Microsoft Forms	https://forms.microsoft.com/
Microsoft Teams	https://www.microsoft.com/en-us/microsoft-365/microsoft-teams/log-in
Mindstorms	https://education.lego.com/en-us/products/lego-mindstorms-education-ev3-core-set/5003400
Miro	https://miro.com/
Moodle	https://moodle.com/
Power Point	https://www.microsoft.com/en-us/microsoft-365/powerpoint
Promethean Board	https://www.prometheanworld.com/
Quizlet	https://quizlet.com/
Screencastify	https://www.screencastify.com/
Teachers Pay Teachers	https://www.teacherspayteachers.com/
Vocabulary.com	https://www.vocabulary.com/
Zoom	https://zoom.us/

Appendix L: Tutorials and Recommendation Compilation List

L.1 Tutorials and Recommendation Compilations Found in Digital Drive

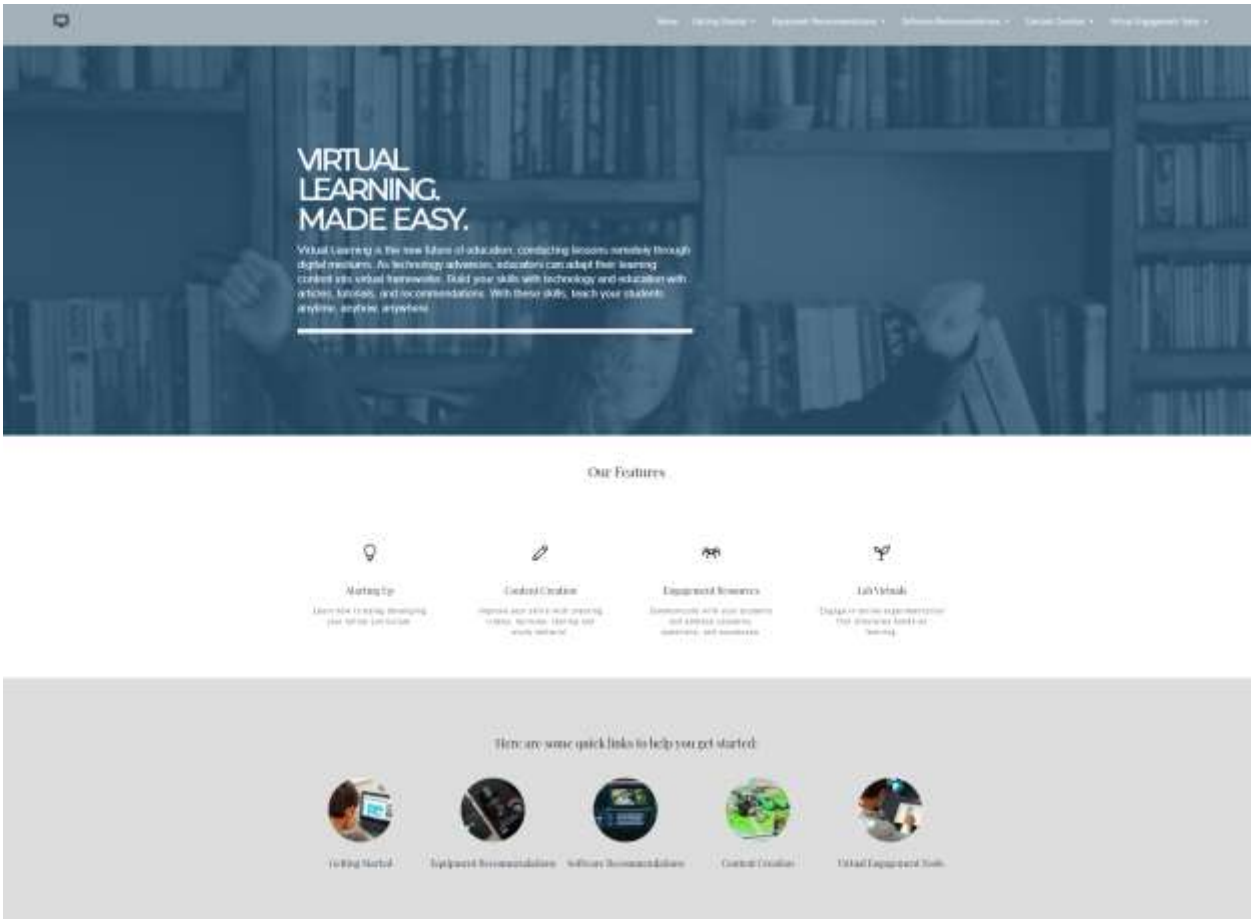
Service	Tutorial/Recommendation	Topic Catalogue
Brilliant.org	Recommendation	Content Creation
Geogebra	Recommendation	Content Creation
HippoCampus	Recommendation	Content Creation
IXL	Recommendation	Content Creation
Khan Academy	Recommendation	Content Creation
The NROC Project	Recommendation	Content Creation
Teachers Pay Teachers	Recommendation	Content Creation
XtraMath	Recommendation	Content Creation
Youtube: Rights to Use Videos	Tutorial	Content Creation
Recording a Video on Phone	Tutorial	Equipment Recommendations
Technical Recommendations	Recommendation	Equipment Recommendations
Using a Phone as a Document Camera	Tutorial	Equipment Recommendations
Gmail	Tutorial	Getting Started
Google Classroom	Tutorial	Getting Started
LEGO Mindstorms	Tutorial	Software Recommendations
Microsoft Whiteboard	Tutorial	Software Recommendations
Screencastify	Tutorial	Software Recommendations
Zoom	Tutorial	Software Recommendations
Kahoot	Tutorial	Virtual Engagement Recommendations
Quizlet	Tutorial	Virtual Engagement Recommendations
ACS Virtual Simulations	Recommendation	Virtual Lab Recommendations
BioInteractive Elisa Assay Lab	Recommendation	Virtual Lab Recommendations
ChemCollective	Recommendation	Virtual Lab Recommendations
Labster	Recommendation	Virtual Lab Recommendations
My Physics Lab	Recommendation	Virtual Lab Recommendations
Phet Simulations	Recommendation	Virtual Lab Recommendations
Praxilabs	Recommendation	Virtual Lab Recommendations

L.2 Tutorials and Recommendation Compilations Found on Website Prototype

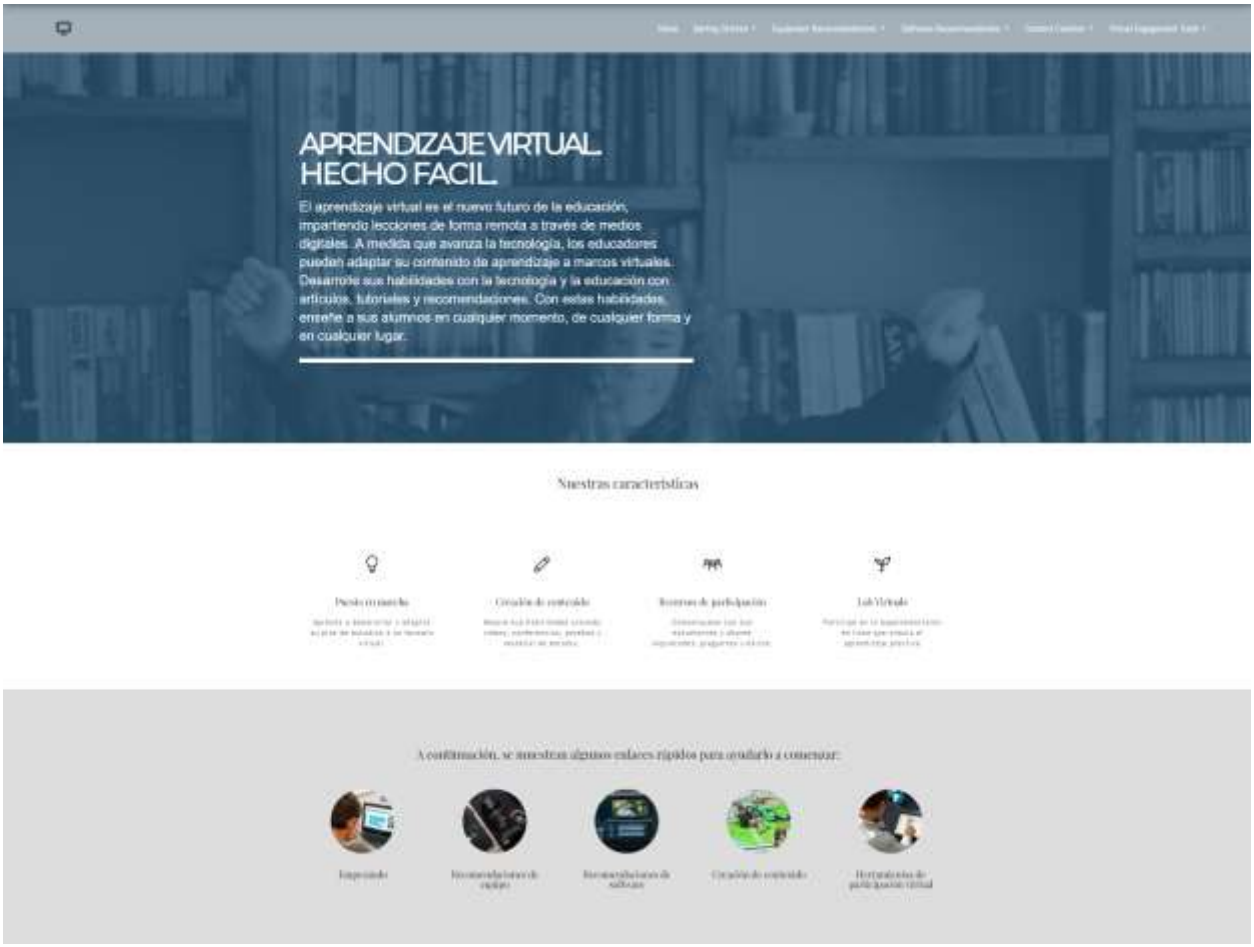
Service	Tutorial/Recommendation	Topic Catalogue
IXL	Recommendation	Content Creation
Khan Academy	Recommendation	Content Creation
Teachers Pay Teachers	Recommendation	Content Creation/Getting Started
Youtube: Rights to Use Videos	Tutorial	Content Creation
Gmail	Tutorial	Getting Started
PhET Simulations	Recommendation	Virtual Engagement

Appendix M: Website Screen Captures

M.1: Website Homepage- English Version



M.2: Website Homepage- Spanish Version



M.3: Getting Started

Getting Started

In this catalogue, we will learn how to get started with Virtual Education. These tutorials will assist you in learning to maintain contact with students, organizing your classroom digitally, and adapting your lessons to a virtual format.

Getting Started: Tutorials

Tutorial: Email Account

Creating an email account is a great way to maintain contact with students digitally by asynchronous communication.

Tutorial: Google Classroom

Organize your lessons, assignments, and students all in one place.

Tutorial: Document Cam

Adapt your hand-drawn and hand-written visuals into a recorded format.

Teachers Pay Teachers

Recommendation: Teachers-Pay-Teachers

Find lesson plans, worksheets, and more with this resource.

M.4: Equipment Recommendations

Equipment Recommendations

In this catalogue, you will learn how to set up your own video recording home studio, as well as what equipment you'll need to create learning content and conduct your class virtually.

Equipment: Recommendations and Tutorials

Tutorial: Document Camera

Adapt your hand-drawn or hand-written visuals into a virtual format

Tutorial: Record Phone Videos

Use your camera phone to record videos for your class.

Recommendation: Tips for Recording at Home

Learn about lighting, camera angles, and clear audio to improve your recording experience

Recommendation: Recording Equipment and Computer Specifications

What kind of technology will you need to create your content?

M.5: Software Recommendations

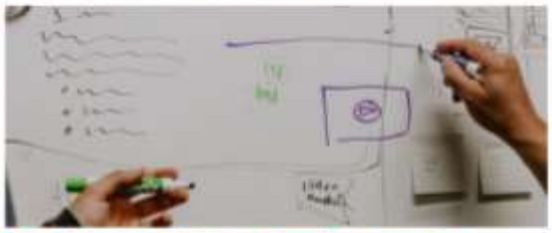
Software Recommendations

In this catalogue, you will learn about various different software to produce and edit your virtual learning content, as well as services to help organize your class.

Software Recommendations

Tutorial: Zoom

Zoom is an online video conferencing platform for meetings and class lectures. Educators can talk with students and display information in real time.



Tutorial: Microsoft Whiteboard

Microsoft Whiteboard is an online white board which allows participants to write down thoughts, share ideas, and brainstorms.

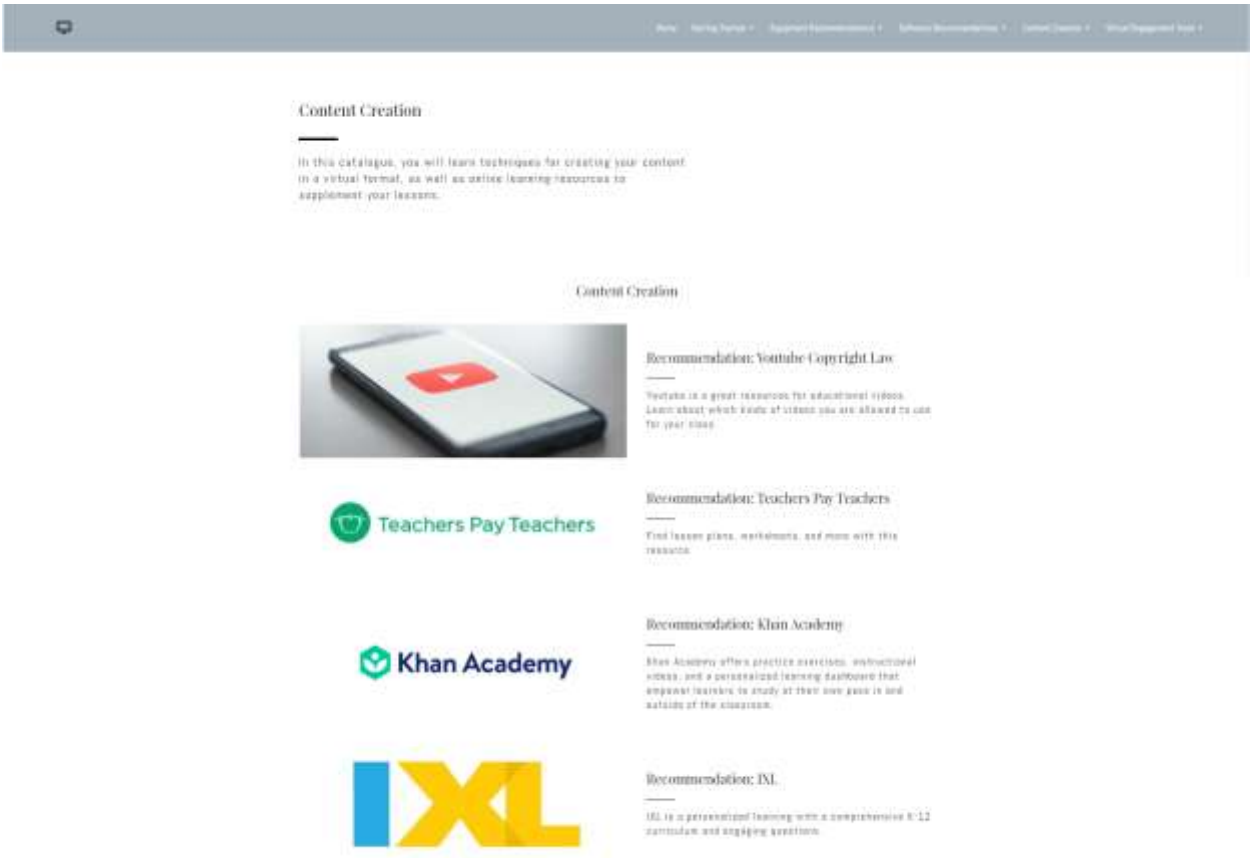
Tutorial: Screencastify

Record your screen and edit the video all within your web browser.

Tutorial: Google Classroom

Organize your lessons, assignments, and students all in one place.

M.6: Content Creation



M.7: Virtual Engagement Tools

Virtual Engagement Tools

In this catalogue, you will learn how to engage your students with fun virtual learning games and virtual lab environments.

Virtual Engagement Tools

Kahoot!

Tutorial: Kahoot!

Kahoot! is a game-based educational testing platform which uses teacher-built multiple-choice quizzes to create an interactive competitive learning experience for students.

Quizlet

Tutorial: Quizlet

Quizlet is an online study application which lets students create virtual flashcards to study course content and prepare for quizzes, tests, and examinations.

Tutorial: Lego Mindstorms

Design, build, program, and experiment with Lego Robotics.

PhET™ INTERACTIVE SIMULATIONS

Recommendation: PhET Simulations

PhET interactive simulations is a collection of free interactive research-based science simulations for topics such as physics, chemistry, biology, math, and earth sciences.

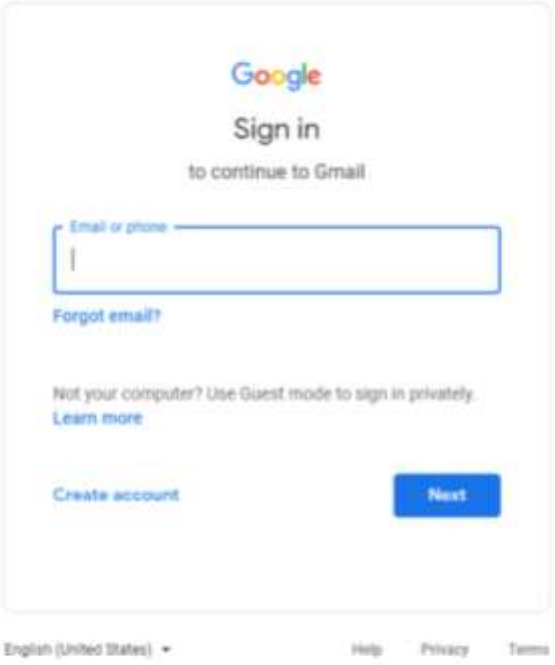
M.8: Email Tutorial

OVERVIEW: EMAIL ACCOUNT

If you are running a classroom with students, whether your content is distributed synchronously or asynchronously, maintaining contact with your students is key. An email account is a great avenue of communication with your students. Email works in the same way as regular mail, yet instead of writing a letter with pen and paper, your students can type their message and questions on the computer, and send their message to a digital email address rather than a mailing address. This tutorial will teach you how to create an email address, how to access emails sent to you, and how to send your own emails to others who have an email address. This tutorial will be using the Gmail email service as an example.

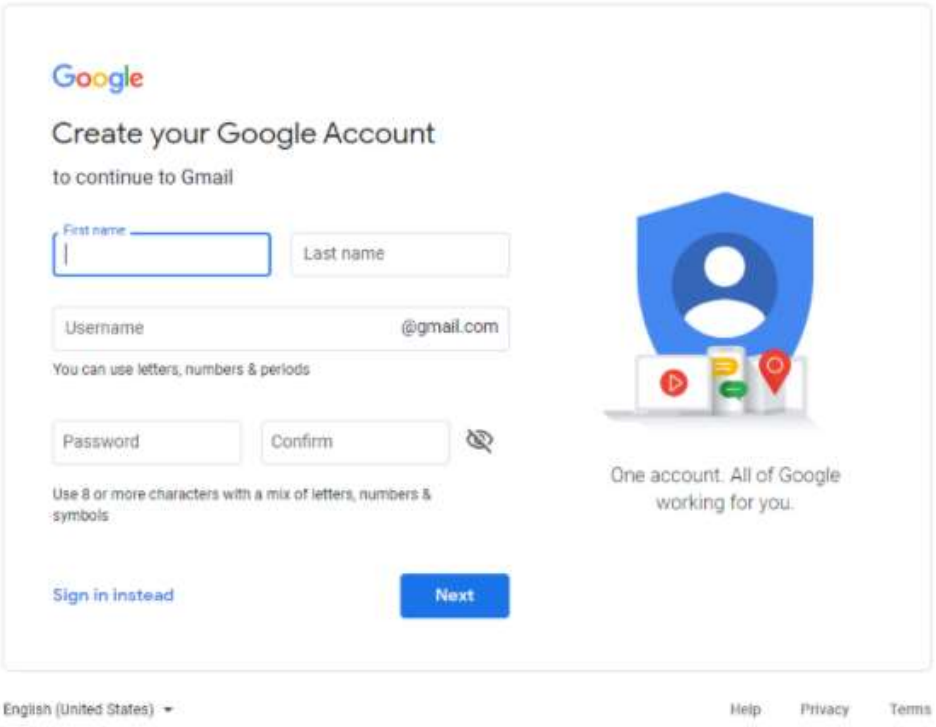
CREATING AN EMAIL ACCOUNT

1. Go to www.gmail.com. This website is how you can sign in to your email account and create your email account.



If you do not already have an email account set up, click on the "create account" blue link at the bottom left of the textbox. This will bring you to a new web page where you can create your email account.

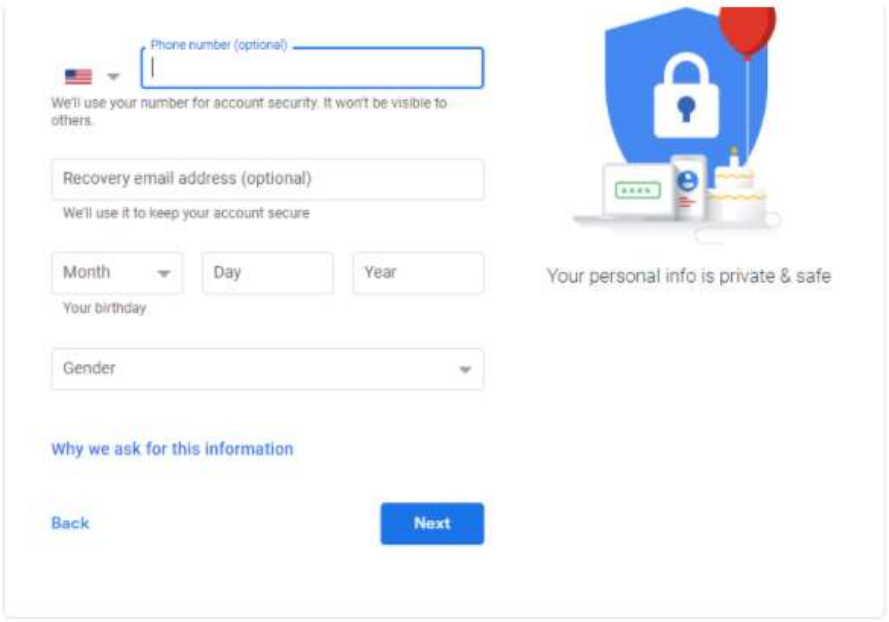
2. To create your account, type in your name into the first two textboxes. The third textbox is where you choose the name of your email address. For example, say you type in the third textbox "abc". This will create an email address for you where your students can send their emails to the address "abc@gmail.com" and you'll receive them. Your email address is unique to you. As such, if you want to access the messages sent to your email address, then you'll need a private password that only you know in order to login to your email account.



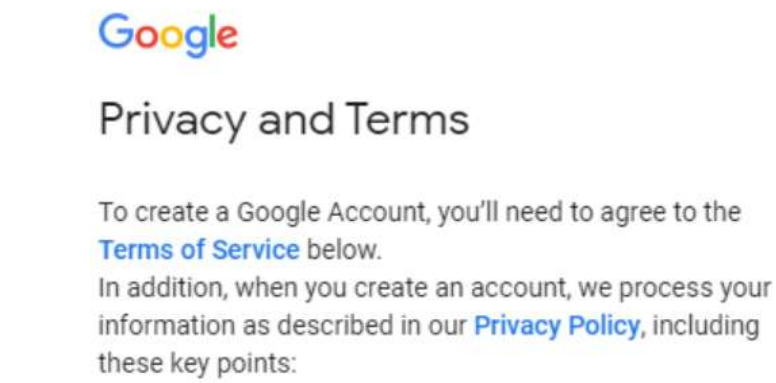
After deciding on the name of your email address, type in your choice of password for your email account. For Google email services, they require passwords to contain uppercase and lowercase letters, numbers, and special characters. In the final textbox, retype your password to confirm that you didn't misspell your intended password in the fourth textbox. After creating your password, click the next button. The next web page covers your recovery options.

Recovery Options and Privacy Statement

3. The recovery options are present in case you forget your password which you need to login to your email address. By listing a phone number or another email address, Gmail will send a web link to that email address or phone number which will let you reset your password for your email so you can re-access it. These recovery options are optional yet are very helpful in case you might forget your email password.

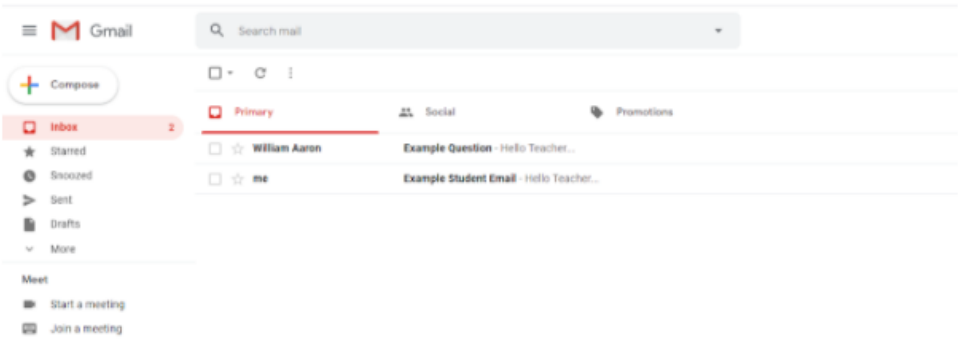


Following the recovery options, Google services asks for your date of birth and gender to create your email account. After this step, Google will ask you to agree to a privacy statement. In order to create your email with google services, you must agree to this privacy statement. Once you agree, that's everything! Your email address is now created.



HOW TO USE YOUR EMAIL ACCOUNT

1. The most basic use of an email account is to send and receive emails from your students. When you first login to your email account, you will see your email inbox. Just like a mailbox, your email inbox is where you will receive all your emails.



In your inbox, you can click on an email, like the example pictured here, and read any message that a student has sent you. You also have the option to reply to their email, which will let you create your own message and send it directly back to them. You can also forward the email, which lets you create your own message, and you can send the students message and your message to any other email address. Whenever you'd like to go back to your email inbox, you can click on the inbox button on the menu to the left of the webpage. To compose your own email, click on the "compose" email button.

2. When you compose your email, the first text box is where you will type out the email address you'd like to send your message to. The second text box is for your subject line, where you can let the receiver know what your email is about. The third textbox is where you can type in your message. At the bottom of the pop-up is where you can include additional attachments to your email. You can include photo files which are saved to your computer which will be displayed in your message, and you can include computer files as well if you'd like to email a word document to your student. Once you've finished composing your email, click on the blue send button to send the email to that address.

Other Resources

Email is a very powerful tool and Gmail includes many other services as well. If you'd like to learn more about what you can do with email, Google also offers tutorials to help teach you how to use more advanced features. On the top right side of the Gmail web page, click on the question mark button, and it will pull up a menu. The first two options, help and training, will help teach you more about how to use Gmail.