Taking STEM Enrichment Camps Virtual: Strategies & Reflections from Quick Pivot due to COVID-19

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***Abstract* - Since COVID-19 began spreading in the US and quickly established as a global pandemic in March of 2020, the NSF-funded STEM SEALs team at North Florida College faced the touch decision to either cancel their inaugural hands-on STEM enrichment camp planned for Summer 2020 or rushing at full speed to take it virtual. The biggest concern in making the decision to go virtual was a passionate belief in the importance of not losing the hands-on focus that had been planned. After all, the STEM SEALs effort at NFC was designed to expand access to high quality STEM experiences for historically underserved students in a high poverty, rural area. Changing from the in-person delivery to distance learning with minimal preparation presented a daunting challenge and also a unique opportunity; the opportunity to study the process and provide guidance to other STEM providers who are considering a move to a virtual platform. This exploratory study aimed to (1) identify the barriers to moving STEM enrichment programming in a rural environment from in-person to virtual activities during the COVID-19 pandemic, (2) describe key decisions that were made in transitioning to the virtual format along with the rationale behind those decisions, and (3) disseminate best practices that emerged from the inaugural effort.**

Index Terms – enrichment, STEM, summer camp, virtual instruction

1. Introduction

In 2020, the severity of the COVID-19 outbreak became clear with the World Health Organization (WHO) officially labeling COVID-19 as a pandemic in March and providing for that label the description of a pandemic that would affect large numbers of people (WHO, 2020). Within weeks, the face of K-12 education in the United States would be drastically altered as stay-at-home orders started going into effect in many states. Across the nation, many public schools would be forced to close their doors and shift teaching to remote instruction and the use of virtual platforms. Not long after, many STEM educators and researchers, including the STEM Sea, Air, and Land (SEALs) team from North Florida College (NFC) in Madison, Florida, began to recognize and accept that the pandemic would not be easily or quickly suppressed.

In March 2020, the STEM SEALs team was preparing for some very exciting educational activities for both teachers and students in the surrounding counties. The STEM SEALs team, led by STEM experts from NFC, a rural community college, and included education researchers from Cynosure Consulting, had just completed months of intense work. Since June 2019, the STEM SEALs team was engaged in the development of stimulating hands-on STEM enrichment activities which included building rovers, boats, and drones that students would learn to code and ultimately use to complete rigorous and fun STEM challenges as part of a weeklong STEM camp hosted on the NFC campus. In August 2019, the STEM SEALs team enlisted the assistance of a design team consisting of nine top middle school educators from the surrounding counties who spent one day each weekend for a month over the course of three months coming together, testing out the curriculum, and providing input on the structure and design of the student experience.

March was to be an energizing month with the STEM SEALs team hosting a large group of teachers on the NFC campus to participate as a review team. As a review team member, local teachers would learn about the STEM SEALs experience content, offer ratings as part of the feasibility testing, and provide feedback that would continue to inform curriculum development and revision.

As the date of the review team meeting approached, the impacts of COVID-19 were increasing. With each passing day the conversations went from whether the review team would meet as planned to whether it would meet virtually or not at all. Sadly, the realization was ultimately accepted that holding a virtual review team was not a viable option. The decision was then made to postpone the review team meeting altogether. As the COVID-19 numbers surged in the US and Florida's own cases began to spike, the thoughts of simply postponing the review team meeting for a month or so led to the realization that the inaugural STEM SEALS summer camp itself, was in jeopardy of not happening.

Then, on April 24th, the team faced the tough decision of deciding the fate of the inaugural STEM SEALS enrichment camp, that was planned for June of 2020. Months of developing curriculum materials, trying out different prototypes, and carefully planning all the details to offer the first summer enrichment experience from STEM SEALS to engage rural middle school student in high quality engineering and computer science hands on experiences seemed futile when it became clear the COVID-19 pandemic would prevent STEM camps from taking place across the U.S. that summer. Knowing the importance of the work to promote equity and access for middle school students in rural Florida, the research team reluctantly made the decision to go virtual.

The Need to Push Forward

Underrepresentation of Rural Students in STEM

In a recent literature review, Assouline, Ihrig, and Mahatmya (2017) cite that rural students contend with issues of geographic isolation and insufficient bandwidth to support online access and full adoption of technological advances (Spencer, 2017), limited access to advanced coursework in mathematics and science (National Science Board, 2014), and economic barriers that inhibit future employment and educational opportunities (Lapan, Aoyagi, & Kayson, 2007). There is a reduced engagement in advanced coursework among this population of low income, rural students in comparison to students from high-income families. This has resulted in an excellence gap that can be documented as early as elementary school and persisting through high school (Plucker & Harris, 2015). Assouline *et al* contend that this "excellence gap represents a growing crisis requiring programmatic intervention" (2017). Students in under resourced rural schools are less likely to reach advanced levels of academic achievement compared with their urban peers, even when they demonstrate high potential (Kittleson & Morgan, 2012).

Challenges and Strategies for Rural Students

High-potential rural students face barriers that reduce options for academic acceleration, putting them at risk of becoming part of the "persistent talent underclass" (Plucker *et al.*, 2015, p. 1). According to Assouline *et al* (2017), one approach to addressing these fundamental differences of access to advanced coursework at the high school level, which contributes to an excellence gap, is to offer extracurricular programming at the middle school level. Extracurricular programs have several advantages for students, especially those from under resourced schools (Plucker & Harris, 2015). The out-of-school hours have the potential to promote positive peer group interactions, socialization, and the development of social, as well as academic competencies for middle school students (Eccles, Barber, Stone, & Hunt, 2003; Olszewski Kubilius & Lee, 2004). Gira (2007) documented the positive effects of out-of-school activities on the educational success of at-risk students due to poverty, including students from rural schools.

Furthermore, extracurricular programming for at-risk middle school students may serve as an impetus, both psychologically and academically, for seeking advanced coursework in high school (Plucker & Harris, 2015). The literature indicates that the goal to improve high-potential rural students' STEM achievement through extracurricular programming "must also consider the inclusivity of identification models for such programming" (Assouline *et al*, 2017). The STEM SEALs project intends to model the potential efficacy of a widely inclusive outreach strategy to generate a broad pool of students from which a cohort of rural, high-potential students who are ready for STEM development opportunities are identified. By casting a wide net of outreach, STEM SEALs will generate engagement from a wide spectrum of students with widely varying abilities, potential, aptitudes, and readiness for STEM talent development.

With the importance of an intervention, like STEM SEALs, at the forefront of the minds of the team, the planning of a virtual student experience and a study of its process moved forward.

Guiding Questions

STEM SEALs was always designed to be more than the creation of high-quality STEM enrichment resources. The work of STEM SEALs was nested within a larger research design focused on learning about enhancing rural STEM pathways and building an evidence base for emerging strategies and materials. Though COVID-19 forced a pause on some of the planned research activities, the sudden need to pivot and move from a face-to-face delivery method to a virtual camp presented a new opportunity for research and learning that was highly aligned with the larger vision of creating broader access to high quality STEM experiences for students in rural parts of the country. The guiding questions for the exploratory study were:

1. What challenges and barriers are encountered in moving a hands-on STEM experience from face-to-face to virtual?

2. What strategies emerge as potential adaptations in addressing the identified challenges and barriers?
3. What unintended benefits emerge from the pivot to a virtual delivery?
4. What lessons are learned that may lead to new directions or adaptations for future camps?

2. METHOD

The research study discussed in this paper employs a qualitive framework at the level of exploratory analysis. Qualitative research aims to understand phenomena which shapes what is experienced by the individuals engaged in the intervention such as the actors, actions, perceptions, motivations and characteristics of the context and outputs. Exploratory studies are a form of preliminary research that lays a foundation of information and emerging understandings and can serve as a basis for later research that seeks to produce more conclusive findings (Jackson, 2020). Choosing an exploratory design affords several advantages that make it well-aligned to the goals of the current research which include: 1) providing researchers with the flexibility to adapt to changes as research progresses; 2) enable researchers to understand at an early stage which aspects of a phenomenon might be worthy of further study; 3) help other researchers to find possible causes of and solutions to a problem, which can be studied further in detail to find out, 4) can lead to further research. Additionally, in present times, its potential to promote rapid learning, boost uptake, and advance dissemination of emergent learning makes it highly aligned to addressing a larger national need for knowledge generation to support a vast number of STEM enrichment providers seeking to rapidly move from more traditional approaches to virtual activities.

Data Sources

Data were gathered from a number of sources to understand the STEM SEALs team's thought process before, during, and after making the decision to pivot to a virtual delivery. These data sources include the following:

Project Team Meeting Participation and Minutes
Throughout the life of the project, the project team has met weekly to track project progress, tackle emerging issues, make key decisions, and plan future work. Meetings are recorded and minutes taken to document important discussions.

Internal Review of Materials
In lieu of a review team, the NFC expert team (a portion of the STEM SEALs project team) walked the researchers (also a portion of the STEM SEALs project team) through key activities in the STEM SEALs experience such as, coding the Micro:bit, assembling the rover, and using the rovers to complete tasks. The review was done virtually over two days, March 27th and April 3rd, as a first field test of delivering this content through distance learning.

Observation of Virtual Camp Experiences
The virtual camp took place July 8ththrough 17th of 2020. It included a number of materials available through Google Classroom, as well as offering synchronous and asynchronous support. Observation of the recordings of these interactions were part of the data collection.

Data from Teachers
Teachers provided information about their background and their perceptions of STEM before and after the virtual camp. They also responded to reflection surveys at the end of each module to track their experience working with students and to offer feedback on recommended improvements.

Data from Students
Students provided information about their background and their knowledge of STEM before and after the virtual camp. They also responded to surveys at the end of each module to track their learning. At the end of the camp, students were asked to reflect on their experience and to offer feedback on recommended improvements.

Data Analysis

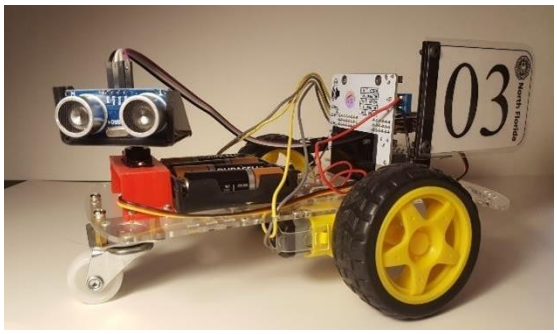
In this study, qualitative data analysis methods were used; namely data obtained, selected, and compiled systematically and then analyzed using various strategies. Program tracking data and document artifacts were compiled and analyzed across dates. Survey data were uploaded into Stata (Version 13) and analyzed using descriptive statistics. Notes and recordings were consulted as the research team engaged in an iterative process of identifying themes that emerged and examining all sources of data for confirming evidence.

3. RESULTS AND DISCUSSION

In the winter of 2020, the STEM SEALs team began working to finalize what would be included in the first inaugural enrichment camp involving students immersed in autonomous and remotely controlled robotic devices. The event would take place on the NFC campus and involve up to 48 students. Then the pandemic struck, and along with it, the uncertainty of how to implement the program and uphold strict distancing measures to ensure the safety of participants. The result was a scaled down enrichment camp that would only involve the LAND Challenge and robotic rovers. Recruitment for the first camp was limited to teachers who had participated in the design or review team process and students with whom

they were already in close contact, such as their own child or a close relative.

Rover kits and activity manuals were mailed or delivered to each participant and the camp was held virtually July 8th through 17th for 29 participants including teachers and students. Daily meetings were scheduled on Zoom with an open forum to allow students to access readily available help from the NFC expert team as needed. Teachers served a dual purpose of helping to coach their student and completing the learning modules themselves. Students and teachers first learned to use and code the Micro:bit, then to assemble the rovers, and finally to work through modules on how to control and move the rovers.



Students said…

> I personally liked learning the coding processes that went into coding the Micro:bit. Learning the code and seeing it work was really satisfying.
>
> I learned a bit more about the electromagnetic scale and got a more in-depth description of how radio waves communicate with each other.
>
> I learned about how even computers use a simulated sense of echolocation to decide how far an object is from it and the patterns it uses to get around the obstacle.

STEM SEALs Camp Content Overview

Module 1: Introduction to the LAND Challenge
- 1:0 Student Guide
- 1:1 Google Classroom Orientation
- 1:2 Sharing with Flipgrid
- 1:3 Getting to Know You Survey
- 1:4 Your Perceptions
- 1:5 Getting Warmed Up

Module 2: Introduction to the Micro:bit
- 2:0 Student Guide
- 2:1 What is a Micro:bit?
- 2:2 What function does the Micro:bit serve in the STEM SEALs Design Challenges?
- 2:3 Unpacking Your Micro:bit
- 2:4 Exploring the Features and Functions of the Micro:bit
- 2:6 Use the Micro:bit to Introduce Yourself
- 2:7 Use the Micro:bit to Play a Game
- 2:8 Understanding the Micro:bit LEDs

Module 3: Chassis Assembly and Propulsion
- 3:0 Student Guide
- 3:1 Rover Kit and Assembly Tips
- 3:2 Assembling the Rover
- 3:2 Assembly Flipgrid
- 3:3 Making the Rover Move
- 3:4 Reverse Motion and Speed Test
- Module 3: Check Your Understanding

Module 4: Controlling the Rover
- 4:0 Student Guide
- 4:1 Using the Micro:bit Radio Functions
- 4:2 Steering with a Remote Control
- 4:3 Is Your Head on Straight?
- 4:4 Steering Calibration
- M4:Check Your Understanding

Module 5: Rover Navigation
- 5:0 Student guide
- 5:1 What is an Ultrasonic Sensor?
- 5:2 Sonar Calibration
- 5:3 Navigating Obstacles
- 5:4 Navigating Obstacles with Artificial Intelligence
- M5:Check Your Understanding

Module 6: Design Challenge Competition
- Event #1: Creativity Expo
- Event #2 : Race to the Limit
- Event #3: Barrel Race Challenge (Remote Control)
- Event # 4: Cutting Corners
- Event #5: Race the Wall-E
- Event #6: Freestyle Course Challenge
- Check Your Understanding

Findings By Guiding Question

1. *What challenges and barriers are encountered in moving a hands-on STEM experience from face-to-face to virtual?*

   Desire to Keep Content, Rigor. The STEM SEALs team did not want to water down the student experience or change the intended programming; that is, there was a desire to preserve the foundational elements of STEM SEALs. The challenge then, was how could students experience the building of the rover and have the opportunity to code it to compete in a real challenge course?

   How to Keep Organized, Pace. In a face-to-face environment, students would be able to work at their own pace with support from teacher helpers and STEM experts. The pace of the camp and the success of students to complete all of the essential elements would be easily observed and tracked by the facilitators. In a virtual space, the team wondered how could the content of the lessons and the coding cards be maintained to allow students to follow along, stay on track, and also proceed at their own pace?

   How to Substitute In-Person Demonstrations. Part of the scaffolding for both the teacher helpers and students would be demonstrations that the NFC experts could provide on the spot during the camp. Thus, the STEM SEALs team would need to tackle the challenge of determining what additional resources would be needed to help students successfully navigate the lessons without the luxury of an in-person demonstration.

   How to Provide Personalized Support. Without the appropriate amount of support, the STEM SEALs team feared the students would not stay engaged or be successful. Sufficient support during a pandemic especially would be a large barrier. Finally, with any new materials, unanticipated issues were bound to arise. How could the team troubleshoot in a virtual environment? And how could instructors connect with participants to provide the one-on-one technical assistance that would be needed to help diagnose problems and scaffold solutions.

2. *What strategies emerge as potential adaptations in addressing the identified challenges and barriers?*

   The Importance of Materials. Through discussion, research and reflection for each of these challenges were addressed by the STEM SEALs team. First, how would the team provide the foundational elements remotely? There would need to be very close attention to the materials. STEM SEALs team members would have to think like a student and what would be available to students. For example, students will not have dual monitors. If students would be using the computer to talk with an expert or watch a video, they would need directions, durable directions, to follow and track their progress for the rover assembly. The team used cards with detailed pictures to give students the support they would need for the technical assembly. To drive the rovers students would need large, flat, smooth surfaces; something that is much harder to locate in rural areas. The team knew that building rovers that could not be successfully driven would leave students disheartened. To ensure every student was positioned for success they arranged for students to compete individually at the college parking lot, but live streamed so that students could watch each other and share in the excitement.

   > In the words of a dyad leader... *Activity cards pictures really helped clarify the steps of each activity and the coding required. Anywhere that more pictures can be added at the various stages of the rover building would help improve understanding of the required activity. The students tended to use the images on activity cards instead of instructions.*

   Taking Advantage of Existing Virtual Platforms. Keeping students on track, while working at their own pace in a virtual environment seemed daunting initially. But, it also felt like a common problem with any remote instruction. The team looked to platforms that existed, especially those that were designed for students of this age and which students may already be familiar. Google Classroom provided an excellent platform for the camp. It included features for presenting content in modules, similar to the design on the original face-to-face camp, and it possessed tools for controlling how far students could progress (e.g., the team set controls for what students could see and click on) and built-in monitoring to track students efforts (e.g., the team could see what students have clicked on and viewed as well as set mini-assignments that showed what had been completed).

   Provision of Numerous Videos. The team recognized the importance of the in-person demonstrations for student learning. To address the need, the team began to explore the numerous videos publicly available and assemble a video library. The videos would not only be needed to supplement understanding of the content, but also to provide a greater understanding of the larger context and the relevance of the camp to real-world applications. For some demonstrations that would be camp-specific, the team got to work shooting videos of themselves to be made available to students as they navigated through the STEM SEALs experience.

In the words of dyad leaders …
The resources are very thorough. Dr. Maresch's video on propulsion was very interesting but the manual programming of the pins was a little confusing considering the knowledge wasn't necessary for the programming tasks in this module…The remainder of the video was very helpful, especially the speed and steer demo and explanation.

In fact, we received feedback that more and shorter videos would be helpful…
To keep the student's attention, the video length needs to be kept at a length of 10 minutes or less. For those struggling, a suggested more detailed tutorial video can be uploaded at the end of each module.

More short videos to explain what is happening at each step and what to expect would be great if available to instructors.

Using Dyads. Sustaining student engagement would be critical to the camp's purpose of exciting students about potential STEM careers. With each module building on the other, students would not perform well in the final challenge if they did not successfully accomplish each module. Especially given the target age of the participants, middle schoolers, having a consistent adult to turn with problems and to nudge them along would be essential. Therefore, the team decided to use dyads, that is, each student was paired with an adult, preferably within their household, who could provide that more intimate, just-in-time support and encouragement, and who would help connect them with the experts and other resources needed to be successful.

Expert Office Hours. Although the use of the dyads would help solve some of the challenges related to student engagement, the educators paired with students could not be expected to have the technical expertise to solve any of the possible issues that could arise. Therefore, the team realized that the experts would need to be accessible to students at specific times so they could ask their specific questions and get the technical assistance needed to advance. The team had to think through when students would need help and work to create a schedule of their availability that aligned to the students.

In the words of a dyad leader on the strengths of the camp…
The willingness of the team to assist with correcting programming. It takes a village:)

3. *What unintended benefits emerge from the pivot to a virtual delivery?*

Increased Versatility. The pivot to a virtual delivery made the STEM SEALs land experience immediately more versatile and resulted in quicker progress towards leveraging virtual platforms. Access to a STEM SEALs experience remotely would be highly advantageous given its target of appealing to students in rural areas.

Strengthening the K-12 Education Connection. The dyad framework also had unintended benefits. By providing STEM exposure and professional development through the virtual camp, had led to a stronger continued engaged by educators who maintain interested in the STEM SEALs grant and larger mission to build a STEM ecosystem in the area. By connecting directly with teachers and then connecting teachers to each other and the STEM SEALs development work, the project has made swifter progress in creating a core group of educators who can serve as ambassadors as the College looks to strengthen its connection to regional K-12 institutions.

4. *What lessons learned led to new directions and or adaptations from the summer?*

Elevating the Framing of Failure. Frustration can be amplified in a virtual environment when students are not able to see others experiencing the same challenges or are spending more time grappling before they are able to receive support or technical assistance. The move to a virtual environment put a larger spotlight on addressing failure and led to more proactive work to frame failure as normal and positive.

In the words of a dyad leader …
Consider that middle schoolers' need consistency across directions, platforms, and materials. It is hard for them to have materials vary in information when in truth the purpose is for the material to match. Many of them get so frustrated they shut down. They love learning computer applications, doing their assignments online. coding is interesting to them; however many get very frustrated. They do not understand that frustration is good/ a part of real learning.

New Approach to Differentiation. Regardless of the mode, the camp would involve students coming with a variety of backgrounds who will need different kinds and amounts of support. Because much of the virtual instruction would take place asynchronously, there was a need to keep instruction shorter, and more condensed. Instructors would not have the same opportunities to scaffold students through a singular pathway. Instead

of constructing a singular path, by the end of the camp the team recognized the need for different pathways designed from the outset that would lead to a similar outcome. Then, instructors would be able to steer students toward the appropriate pathway so all could feel successful progressing in a way that was aligned to their prior knowledge and existing expertise.

Need to Connect Students to Each Other. Creating bonds between participants in a virtual environment was an anticipated challenge. While the team had great success in connecting individual students with a dyad support and with the STEM SEALS expert team, the attempts to use participant self-introduction videos, videos to showcase participant work, and other strategies to promote team building and student to student connectivity fell short. New adaptations are currently being considered.

> In the words of a dyad leader …
> *With the online program this year, there was not a lot of peer student interaction which many teachers felt would have helped the students to work through the many difficulties they had. Most instructors agreed that the materials provided opportunities for students to express, clarify, justify, interpret, and represent their ideas (i.e., making thinking visible) and to respond to (some limited) peer and teacher feedback.*

4. CONCLUSION

STEM SEALs a National Science Foundation (NSF) funded research multi-year project at North Florida College (NFC) recently completed its first Summer Institute – virtually! The STEM grant focuses on developing and implementing a program for rural middle school students in remotely and robotically controlled vehicles for sea, air, and land, hence the SEALs label. The grant's aim is to promote greater awareness of STEM pathways, increase readiness of area students for STEM post-secondary study, and to build student skills and confidence in exploring STEM training and careers in the surrounding counties of Jefferson, Madison, Hamilton, Suwannee, Lafayette, and Taylor. Small, isolated rural schools have limited capacity, in terms of expertise and resources, for providing highly engaging, integrated STEM experiences for students. This grant focuses on rural applications of STEM that both connect students' regional identity to a STEM identity, and connect local STEM experts with school-level STEM learning. With that charge, the STEM SEALs had to suddenly pivot from a face-to-face camp to a virtual camp. Such a transition was ripe for discovery and learning. Many solutions to common challenges were acted upon and some unintended benefits unearthed. Still, some challenges remain, including the internet connectivity issues that disproportionately impact rural environments. There were a couple of students who did not complete once their dyad teacher leader was unable to maintain her role due to unforeseen circumstances. Without a strong relationship built between the student and the NFC expert, it was difficult to help those students troubleshoot and stay engaged. Still, this experience provided enough evidence of the promise of virtual camps in accomplishing many of the aims set forth by in-person STEM enrichment programs.

5. REFERENCES

Assouline, S. G., Ihrig, L. M., and Mahatmya, D. (2017). Closing the excellence gap: Investigation of an expanded talent search model for student selection into an extracurricular STEM program in rural middle schools. *Gifted Child Quarterly, 61*(3), pp. 250 –261.

Eccles, J. S., Barber, B. L., Stone, M., & Hunt, J. (2003). Extracurricular activities and adolescent development. Journal of Social Issues, 59, 865-889. doi:10.1046/j.00224537.2003.00095.x

Gira, R. (2007). The challenge: Preparing promising low-income students for college. In J. VanTassel-Baska & Stambaugh (Eds.), Overlooked gems: A national perspective on low-income promising learners: Conference proceedings from the national leadership conference on low-income promising learners (pp. 69-74). Washington, DC: National Association for Gifted Children.

Jackson, C. (2020). The Advantages of Exploratory Research Design. Available at https://www.ehow.co.uk/info_8525088_advantages-exploratory-research-design.html

Kittleson, T., & Morgan, J. T. (2012). Schools in balance: Comparing Iowa physics teachers and teaching in large and small schools. *Iowa Science Teachers Journal*, *39*(1), 8-12.

Lapan, R., Aoyagi, M., & Kayson, M. (2007). Helping rural adolescents make successful postsecondary transitions: A longitudinal study. *Professional School Counseling*, *10*, 266-272. doi:10.5330/prsc.10.3.u6j3j64h48p27w25

National Science Board. (2014, February). *Science and engineering indicators 2014* (NAB 14-01). Arlington, VA.

Olszewski-Kubilius, P. (2015). Talent searches and accelerated programming for gifted students. In S. G. Assouline, N. Colangelo, J. Van Tassel-Baska, & A. Lupkowski-Shoplik (Eds.), A nation empowered: Evidence trumps the excuses holding back America's brightest students (pp. 111-121). Iowa City, IA: Belin-Blank Center for Gifted Education and Talent Development.

Plucker, J., & Harris, B. (2015). Acceleration and economically vulnerable children. In S. G. Assouline, N. Colangelo, J. Van Tassel-Baska, & A. Lupkowski-Shoplik (Eds.), *A nation empowered: Evidence trumps the excuses holding back America's brightest students* (pp. 181-188). Iowa City, IA: Belin- Blank Center for Gifted Education and Talent Development.

Spencer, K. (2017, January 22). *Not all towns are created equal, digitally: How a Colorado school district struggles to give its students a technology boost* (The Hechinger Report). New York, NY: Teachers College at Columbia University.

World Health Organization. (2020, May 30). WHO Coronavirus Disease (COVID-19) Dashboard[Online]. Available at https://COVID19.who.int/?gclid=CjwKCAjwiMj2BRBFEiwAYfTbCod9hYnKI6jtuqIoHEVnStP_VrjFu3NFnfkKJSgh9rZcBuI7mtmfDhoCuYcQAvD_BwE