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Addressing Digital Technologies Needed for Students in K-12 Schools

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Abstract

This research aimed to learn more about how K-12 schools have addressed the needs of all students in their school districts equally as it relates to access for appropriate technology for distance learning. The intended research was conducted through Qualtrics, an online survey software, which was dispersed through social media sites to reach broad and diverse pool of participants within this study's target audience, to include parents, teachers, and administrations in a K-12 school system. Participants who clicked on the link to the survey were given an informed consent notice, including an explanation of how distance learning and equitable access to technology is defined for the context of the study, and date when the survey will be closed down. The data from the study was collected and interpreted using Qualtrics data analysis methods, which were compared with prior literature to provide insight on factors that influence equitable access to digital technology.

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Introduction

The COVID-19 pandemic has changed education as we know it. Schools have gone from traditional classrooms and in-person instruction to distance learning. As the pandemic evolved, schools were forced to explore other options for the past school year. While some districts were in favor of returning to in-person instruction, other districts stated they would not be returning until there is herd immunity. Herd immunity is when a large portion of a community becomes immune to a disease through exposure or vaccination (Mayo Clinic, 2020).

As this situation continued, in the United States, schools, teachers, parents, and students faced obstacles never seen before. This research examined how K-12 schools have addressed the needs of all students in their school districts equally as it relates to access for appropriate technology for distance learning.

Problem Statement

While some students are adjusting to distance learning, there are others having difficulty adapting (The Learning Network, 2020). A student's socioeconomic status could affect his or her ability to participate in distance learning. For example, some students do not have access to the resources needed -- such as laptops and internet access -- to participate in online education. Some schools have addressed this issue by providing technology for students to take home. In primary grades, teachers went as far as to create and print out packets that students can pick up from their respective schools (Bechman, 2020).

While these options addressed the current issues at hand, there were still other issues that students could face that could have an impact on their education and academic success. For example, some students have the freedom to participate in distance learning from wherever they want, while other students may only participate in after-school hours. This could cause students

to miss out on live video conferences between their teachers and the other students. In the primary grades, these live video conferences are especially important since younger children are not as disciplined as older students to learn on their own (Goldstein, 2020).

Schools must implement plans that address the technology needs of all students. Therefore, if a student does not have access to a laptop or internet connection, then schools must provide said technology. Schools need to be prepared to address the issues that are arising amid the change from traditional classrooms to distance learning so that they are able to address the needs of all their students while providing equal opportunities for learning and access.

Rationale

As we have seen, the COVID-19 pandemic has raised a lot of issues regarding distance learning. While some students learn and benefit from distance learning, other students still remain disadvantaged in regard to access to appropriate technology for distance learning (Mineo, 2020). It is important to research and address the issues and differences in accessibility to better accommodate future distance learning whether it is because of the COVID-19 pandemic or in response to other needs and/or a future crisis. Without this research, if schools were to have to suddenly move to distance learning in the future due to unforeseeable circumstances and there were no plans in place to address the diverse needs of the students, then students would once again be at a disadvantage. For such reasons, it was crucial that research be done to learn more about how K-12 schools are addressing these needs.

Goals and Contributions

The goal of this study was to research how schools are meeting the needs of students in regard to access to appropriate technology as it relates to distance learning, as well as how to maximize a student's ability to succeed academically while distance learning. Research also

examined resources and training that has been put in place as a response to the COVID-19 crisis to address the need for digital technologies as it relates to distance learning.

Evidence and Significance

In this research paper, the proposed research questions were addressed through quantitative research using Quadratics, an online survey software, which was dispersed through popular social media sites. Additionally, peer-reviewed journals were included in the research to provide insight to the research data. As has been reported in the popular news, there have been issues with access during the transition to emergency remote learning in the final three months of the school year, thus far in the COVID pandemic. There are many issues that school districts are unable to address, with access to the appropriate technology to participate in distance learning being one of them (Goldstein et al., 2020). Without access to the appropriate technology, students are unable to participate in eLearning which affects their academic success.

By conducting this research, parents, educators, and administrators in a K-12 school were asked to share their experience with distance learning. By learning what these adults have witnessed in their respective field in regard to their students' needs, schools will be better prepared to address future crises.

Explanatory Definitions

The following terms have been identified as important terms and definitions to know for this research:

COVID-19, or Coronavirus, stands for a disease that emerged in 2019 (Centers for Disease Control and Prevention, 2020).

Distance Learning is a method of virtual education delivered via the internet and other platforms without face-to-face instruction between the student and instructor (National Education Association, 2019).

eLearning is a method of online virtual education delivered via the internet. Unlike Distance Learning which occurs through virtual communication, eLearning is delivered completely online and is not considered traditional education ("What is eLearning?", 2020).

Homeschool is a form of private education which is equivalent to public education that takes place in the home (Carlson, 2020).

Novel Coronavirus is a new coronavirus that has not been identified (Centers for Disease Control and Prevention, 2020).

Online Education is perceived as internet-based education, which includes distance learning and eLearning, and is delivered via the internet and other platforms (Mbuva, 2014).

Pandemic is the spread of a disease globally which emerges in humans and spreads easily from human-to-human contact (Doshi, 2011).

Traditional Classroom is a learning environment where students learn through lecture, group work, etc. There is face-to-face interaction between the student and instructor, as well as in between the students themselves (Black, 2002).

Literature Review

The COVID-19 pandemic has forced schools across the nation to find alternative methods to education to the traditional classroom. Educators, parents, and students alike are having to adapt from traditional school hours and routines to online distance education. As schools moved from in-person classes to distance learning, students are having to deal with issues that would have otherwise not have presented themselves. Students are facing challenges

such as the lack of appropriate technologies (such as internet access and modern equipment) to participate successfully in distance learning. Other challenges included a potential lack of computer skills, lack of motivation, control over their schedule, insufficient control [over curriculum] by teachers, and unclear instructions provided by teachers (Yuliia, Nelia, and Yana, 2020).

While some schools have done their best to address the issue at hand, some schools were unable to keep up with the demands of distance learning such as providing students with digital technologies to take home (Auxier and Anderson, 2020). Since public schools are led at the district level, each district is having to create their own school plan and guidelines as to how to handle distance learning and the challenges it presents. Unknowingly, this created an academic national divide between students, since some students are able to continue their education online while others are not due to the lack of digital resources to participate in eLearning.

Background

"Roughly six-in-ten students [58%] say they use the internet at their home to do homework every day or almost every day" (Auxier and Anderson, 2020). However, "One-in-four teens in households with an annual income under $30,000 lack access to a computer at home, compared with just 4% of those in households earning over $75,000" (Auxier and Anderson, 2020). While a large percentage of students use the internet to complete their homework, some students, or one-in-four with household annual incomes under $30,000, are unable to access the internet to complete their homework. This was a large percentage of students that are being academically disadvantaged because of the lack of appropriate digital technologies. If this technology disadvantage existed prior to COVID-19, then it only highlighted the issue even more since students are being asked to use digital technologies to participate in eLearning.

Globally, educators are facing similar challenges such as providing digital technologies as it relates to distance learning to all students. Though navigating through distance learning is difficult and has many uncertainties, some scholars believe that distance learning can be as effective as traditional classrooms in regard to students' academic success if schools accommodate the digital needs of students (Favale, Soro, Trevisam, Drago, and Mellia, 2020).

Throughout previous research and literature, it has been highlighted that there is insufficient research on this topic. Since schools are being enforced to move to an online platform since the outbreak of COVID-19, administrators and educators are still learning the ropes of distance learning, which includes how to accommodate students in regard to digital technologies with which to participate in distance learning. There has been little research found on how schools have adapted to distance learning and how they planned to accommodate students in future academic school years. Instead, there was significant research addressing the pros and cons between traditional classrooms and distance learning.

Distance Learning vs. Traditional Classrooms

Since the outbreak of COVID-19, schools have transitioned from the traditional classroom to distance learning. However, some students were already enrolled in virtual schools prior to the pandemic. Previous research and literature exist in regard to the benefits that virtual schools provide. eLearning allows for more flexibility in the lives of educators, parents, and students. Unlike a traditional classroom, which requires teachers and students to be physically present at the time of the class, virtual classrooms allow students to complete coursework at their own pace. Online education allows administrators and educators to reach a broader audience, while practicing modern pedagogy. In regard to the student, distance education allows students to have their needs met through one-on-one meetings with their teachers and counselors, while

providing a low-cost option for education. eLearning has become so popular in recent years that some states are recommending the use of distance learning instead of traditional learning (Tucker, 2001).

In one study, researchers compared the understanding of a water cycle lesson between students in a traditional classroom to students participating in distance learning. Researchers found that students learned better through distance learning because of the level of engagement that online lessons required of students (Furió, 2010). Students who participated in distance learning were able to use argumentative reality as a part of the lesson.

However, just as there is research that supports distance learning's success, there is research that supports the idea that traditional classrooms are still more beneficial than distance learning. In one study, researchers found that students who learned through traditional classrooms were 24% more likely to do well on tests than students who learned through online lessons (Emerson & MacKay, 2011).

As seen in both of these studies, there was research which both supported and denied the claims that distance learning is as beneficial as traditional classrooms. While researchers learn more about distance learning, researchers need to address how K-12 schools have addressed distance learning as it relates to the digital technologies appropriate for distance learning.

How Schools Have Addressed Distance Learning

Schools around the nation have used different approaches to address the needs of distance learning. While some schools are able to provide their students the materials and resources needed to participate in distance learning, some schools are not financially able to. International

research is emerging from countries who have dealt with the COVID-19 pandemic before the United States.

Research that is available regarding distance learning is emerging from China, who has dealt with the virus significantly longer. China initiated an emergency policy called *Suspending Classes Without Stopping Learning* in response to COVID-19, an unforeseeable crisis. The goal of the initiative was to support student education across the nation while socially distancing from each other. However, disagreement about what to teach, how to teach, the workload of teachers and students, and the teaching environment emerged between administrators and educators. Educators felt distance learning disadvantaged their students due to a lack of infrastructure as it relates to the online classroom, inexperience of teachers, the gap of knowledge between students, and the home environment (Zhang, Wang, Yang, and Wang, 2020).

In another study, Ukrainian scholars found that the following guidelines should be implemented to address the needs of students as it relates to distance learning: the development of distance education, the creation of electronic textbooks and teaching materials, proper online training for educators, the development of a network between schools, universities, and corporations, and a government agency which provides guidelines for distance learning (Yuliia, et al, 2020).

As seen in previous research and literature, there are different plans in place to address the needs for digital resources and materials. Different countries [and states] are following different guidelines to ensure their students are still being provided an equal education. While some countries [and states] are able to provide their students with the appropriate technologies, other are not. Unfortunately, distance learning presents new challenges that would have

otherwise not been seen in traditional classrooms. To address and overcome these challenges, researchers must learn how school districts can address the needs of students in a K-12 school, that will allow administrators, educators, and parents to support the needs of the students.

The Future of the Distance Learning

As schools continue to adapt to distance learning, administrators, educators, and parents must have resources in place to address the needs of students. As shown in previous research and literature, distance learning provides benefits that traditional classrooms do not provide, however, it also provides challenges to students who are socioeconomically disadvantaged. Schools must be prepared to address the obstacles that present themselves from distance learning (Hirpara, 2020).

When transitioning to a virtual classroom, administrators, educators, and parents need to have a plan in place to meet the needs of students. How will students be provided appropriate resources and materials, such as digital technologies, in regard to distance learning? It is the role of the educator to design the course and to incorporate video and journal articles into online courses to create engaging lessons and activities that would otherwise be part of a traditional classroom (Fawns, et al, 2020). Instead of focusing on classroom management, teachers are able to refocus their attention to create engaging lessons. This includec reaching out to students and discussing their progress in the course (Fawns, et al, 2020). However, educators can only do so much. It is crucial that the district [and school administrators] create a detailed plan to provide students with the resources and materials needed for students to succeed in distance learning.

As seen in previous research and literature, distance learning presents new challenges that would have otherwise not been seen in traditional classrooms. To address and overcome these

challenges, researchers must learn how school districts can address the needs of students in a K-12 school. This will allow administrators, educators, and parents to support the needs of the students.

Regardless of how K-12 schools address the needs of students, scholars believe traditional classrooms are outdated and need to adapt to changing times. "The traditional college classroom design is based on the educational space that first appeared in medieval universities. Since then classrooms have not changed except in their size" (Park & Choi, 2014). Some scholars believe that this is a wakeup call for school districts and policies. "The next ten years will see dramatic changes in the future of education. Inside the classroom of the future, you will have a blend of real and virtual instructors, and your classmates next to you may be physically located in different parts of the world. Your classroom environment can be instantly transformed from a traditional class to external learning environments such as museums, zoos, laboratories, or any place in the world. Your course is no longer limited to the pace dictated by your instructor or the levels of your classmates, but by yourself" (Tsai, 2013, p. 1268)

Conclusion of Literature Review

There are still multiple obstacles that schools must address to meet the needs of their students as it relates to digital technologies appropriate to distance learning. Further research needs to be done so that school districts can learn how to address the needs of students. Regardless of what happens, teachers will continue to have an important role in the lives of students. The role of the traditional teacher will still be required in future classrooms, but the role as it is known will change to adapt with time. Within the next decade, education will go through a dramatic change (Tsai, 2013). However, for education to go through this change, further

research needs to be done to address the current issue at hand. How have K-12 schools addressed the needs of all students in their school districts equally as it relates to access for appropriate technology for distance learning?

Methodology

Research Question

The proposed methodology to conduct this research was a mixed methods approach using Qualtrics, an online survey software, and peer-reviewed journals provided by the University of Mary Washington's library database. The online survey was dispersed through social media sites using relevant hashtags to reach a broad and diverse pool of participants within this study's target audience, to include parents, teachers, and administrators in a K12 public school system. The data found in the peer-reviewed journals was compared to the quantitative data collected from the survey for this study. Both of these methods, the online survey and the peer-reviewed journals, was used to address the research question for this study.

It was important to research this topic so that school districts can provide students the materials needed to successfully participate in distance learning (Rockwell et al., 2020). Unfortunately, there was not sufficient research and information available for educators, parents, and students. As was seen in popular news, prior to the COVID-19 pandemic, there were no guidelines in place for educators and students to follow in the case of distance learning. Through this research, researchers were able to help identify what challenges students were facing as it relates to technology access which could allow schools to prepare for unforeseeable crisis, such as the COVID-19 pandemic.

The following question was addressed in this research:

- How have K-12 schools addressed the needs of all students in their school districts

    equally as it relates to access for appropriate technology for distance learning?

Description of Participants and Setting

The survey captured data from the target population for this study. The target population were parents, teachers, and administrators in a K-12 school system as the research question focused on equitable access and distance learning equity.

Popular social media sites such as Twitter, Facebook, and Instagram were used to gain exposure to a broad and diverse audience within the target audience for this study. Appropriate hashtags related to the topic, including some of the explanatory definitions highlighted earlier in the proposal, were ran alongside the survey, such as #DistanceLearning, #eLearning, #COVID19, #Coronavirus. The survey was posted daily among various social media sites for a seven-day period.

Following IRB approval, participants were recruited using social media posts on Twitter, Facebook, and Instagram that included a brief description of the survey and its purpose, a link to the survey, and hashtags.

Procedures and Research Approach

A quantitative study was conducted through Qualtrics by surveying parents, educators, and administrators in a K-12 school system. The survey was shared through different social media platforms alongside appropriate hashtags.

The research questions listed below are original questions influenced from prior literature, research reports, and personal experience. The research questions requested socioeconomic

information from participants to gather information on participants who participate in the study. By having participants socioeconomic statuses, the data was able to be thoroughly analyzed to view trends between relationships and associations in certain questions. These questions were appropriate to the study because it allowed researchers to view trends between socioeconomic status and academic success in regard to distance learning. The questions were worded in simple language to allow a broad and wide range of audience to participate in the study.

The survey requested information on socioeconomic status, as well as ethnicity, gender, income level, school district, etc. at the beginning of the study from participants such as:

- How many people (including yourself) live in your household?

- How many people in your household are currently in a K-12 school?

- What describes your yearly household income before taxes? Below $20,000, $20,000 to $40,000, $40,000 to $60,000, $60,000 to $80,000, $80,000 to $100,000, or greater than $100,000?

- Select all that apply. Are you a teacher, parent/legal guardian, and/or administrator?

- Please indicate your professional teaching experience. 0-4 years, 5-10 years, 10+ years.

Once participants clicked on the link to the survey, they were given an informed consent notice (see Appendix A), including an explanation of how distance learning and equitable access to technology is defined for the context of the study, and a date when the survey would be closed down. At the end of the consent notice, participants were required to click an "Agree" button in order to respond to the survey questions. After participants completed the survey, they were

thanked for their participation. The online survey was refreshed, and the post was reposted to social media with a survey link every day during the seven-day survey period.

There was a pilot test with a small group of people (to include one parent and one educator) to try out the survey and check for participant understanding. The purpose for a pilot test was to see if a question needs clarity, revisited language, or to be eliminated. The responses from the pilot test did not count towards the survey results.

Data Collection

Quantitative research is data collected through measurements, such as the data from a survey (Macalester College, 2020). Participants were provided yes/no questions (to capture demographic data and background knowledge data), comparative rating scale questions using category scales to capture opinions and perceptions, and open-ended questions to gain explicit insight into perceptions and experiences.

The participants who participate in the survey were asked the following questions:

- How has the COVID-19 pandemic affected you (and your family) as it relates to education?
- What are some of the educational obstacles faced?
- Do you have reliable technology and internet access at home? If not, has your school district done anything to address your need for technology? If so, what? If not, why not?
- Are you (the student) able to complete schoolwork on your own or does your parent/guardian require an adult present when you are online?
- Do you have a designated learning area (such as an office)?
- How successful were you in completing your schoolwork this past academic year? (There will be a scale which students can rate themselves from).

- Do you find distance learning as beneficial as in-person learning? Why or why not?

- Do you think you learned as much as you would have if you were in a traditional classroom? Why?

- Would you participate in distance learning if offered again?

- Please describe your personal experience with distance learning.

- How do you think schools will change in the future?

Data Analysis

The data from the quantitative study was collected and interpreted using Qualtrics data analysis methods such as charting and graphing options to analyze the relationship and associations between certain questions. (University of Mary Washington, 2019) Descriptive statistics using counts and percentages, central tendencies, and variations of the data were used. Questions that allowed for participants to respond to a question according to their satisfaction used the Likert scale, which allowed for data to be analyzed on a comparative rating scale.

Data collected from the survey was thoroughly analyzed and compared with prior literature, to provide insight on factors that influence access to digital technologies and to create ways to provide better access to all students. The data from the survey was turned into a visual representation, such as a chart and/or graph, to illustrate similarities in answers among participants. These original graphs are included in the research paper. It was necessary to analyze relationships and associations between certain questions to understand how students have responded to distance learning.

Potential Limitations and Implications

Quantitative data was collected through Qualtrics survey software by surveying parents, educators, and administrators in a K-12 school system. The link to the survey was shared on social media platforms alongside appropriate hashtags which related to the survey topic. Possible limitations and implications included adults not wanting to participate in the study due to various reasons, children filling out the study, and not having enough participants. To address these potential limitations and implications, the survey was shared across various social media platforms with appropriate hashtags so that it can reach a broad audience, while providing an informed consent notice (see Appendix A).

Results

The survey was posted across different social media platforms for a period of a week. After a week, the survey was closed, and participants were no longer allowed access to the survey. Until then, participants were given permission to revisit the survey to complete any unanswered questions. While all percentages should equal up to 100%, there are some cases in the data where percentages are one to two percentages off. This is because participants were allowed to skip any questions, they did not feel comfortable answering.

In total, there were 54 participants, ranging from a diverse audience of parents, teachers, and/or administrators. Some participants identified in more than one category.

Q9 - Are you a teacher, parent/legal guardian, and/or administrator? Select all that apply.   Page Options ∨
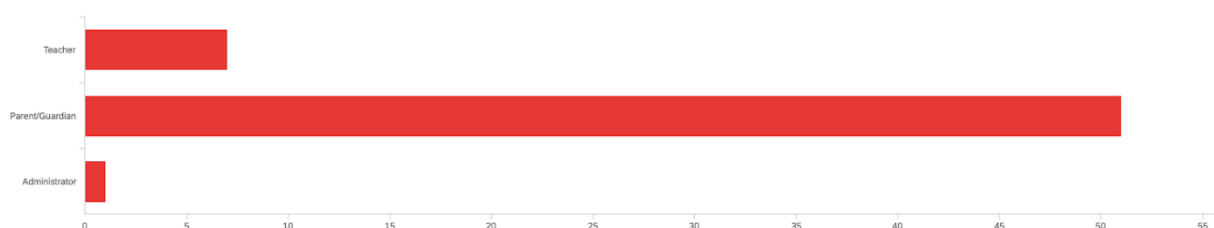


Figure 1: Survey Participants

As seen in Figure 1, parents made up 86% of responses, teachers made up 12% of responses, and administrators made up 2% of responses. Together, parents, teachers, and administrators made up all participant data.

To begin, participants were provided questions on their socioeconomic status. Participants were instructed to share how many people, including themselves, lived in their household. Additionally, participants were instructed to share how many of those people [who lived in their household] attended a K-12 school. While some participants had more or less people in their household and in a K-12 school, the average household consisted of 4 people with 2 students enrolled in a K-12 school.

Participants were instructed to share their annual household income before taxes.
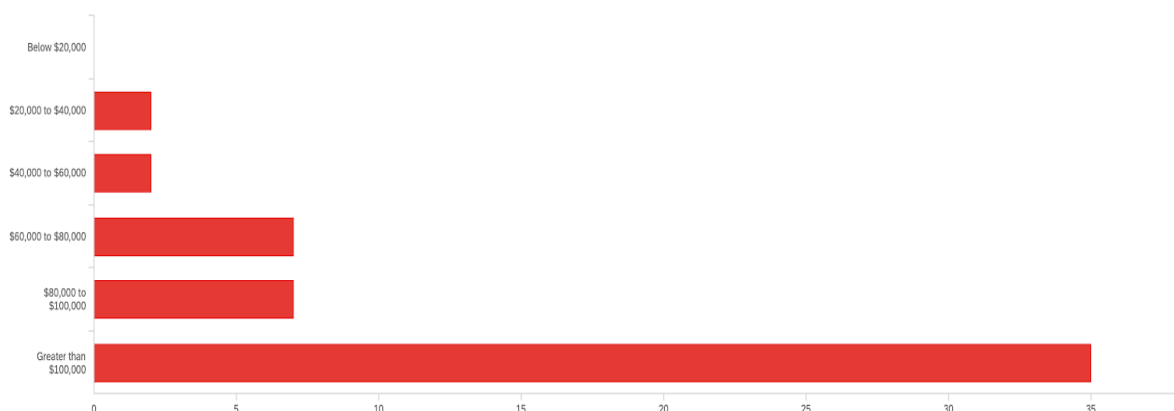
Figure 2: Participant Yearly Income

As seen in Figure 2, 65% of participants made greater than $100,000 a year. 13% of participants made $80,000 to $100,000 a year. 13% of participants made $60,000 to $80,000 a year. 4% of participants made $40,000 to $60,000 a year. 4% of participants made $20,000 to $40,000 a year. There were not participants who identified with less than $20,000 a year.

Following questions on socioeconomic status, participants were questioned on digital technologies needed for distance learning. Some questions investigated how the COVID-19 pandemic had affected students' success as it relates to digital learning, while other questions investigated the need for digital technologies.

Participants were prompted to share how the ongoing health crisis has affected their family as it relates to education. 94% of participants described their experience with distance learning as negative. Participants were asked to share the obstacles and difficulties experienced with distance learning. The following has been paraphrased to illustrate the participant feedback:

- Participants felt that the 2020-2021 academic year felt like a gap year. Students were not learning as much as they usually did in person.

- Participants found that students were failing academically due to lack of motivation among other issues. In some cases, participants believed that students would need supplemental courses to make up the academic year.

- Participants found that students were falling behind mentally and emotionally due to lack of social interaction present in a traditional classroom.

Unlike the majority of participants who found distance learning to be a negative experience, for a small number of participants found that their students were excelling through distance learning. 5% of these participants stated that their students were doing their best academically when compared to previous academic years.

Following this question, participants were instructed to share educational obstacles students might have experienced. While some of the feedback was similar to the previous question, the following are answers participants shared as it relates to education directly:

- Participants found there were issues with WiFi/Internet access as well as technology. Students had difficulty accessing the required websites and/or links provided by the teacher.

- Participants found they needed to learn how to navigate an app or website before teaching students how to use them, especially in the lower grades.

- Participants found there was less face-to-face instruction for students. In some cases, this made teaching/learning content virtually difficult.

Following these questions, participants were questioned using scaled as well as multiple questions. Participants were asked to share if they had reliable technology and internet access at home. If not, participants were asked to share if their school district had done anything to address the need for technology.
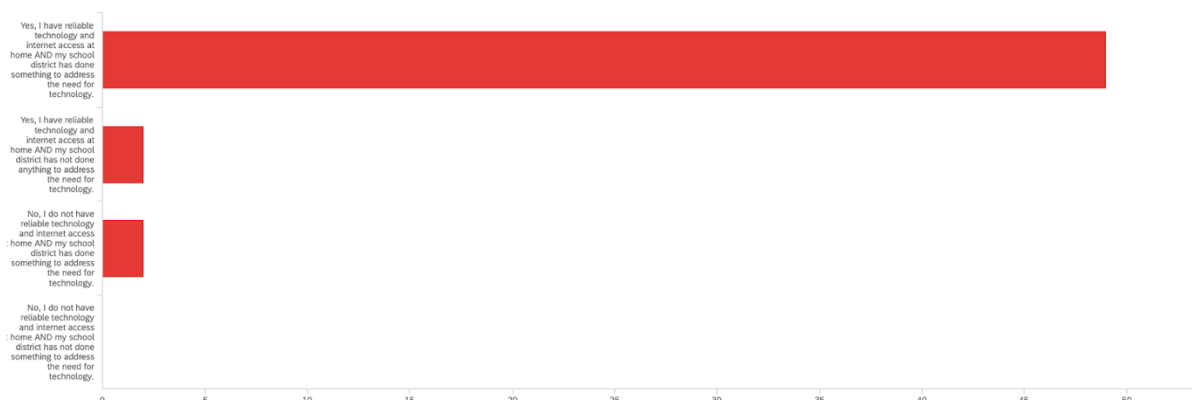
Figure 3: School Response to Need for Technology

As seen in Figure 3, 91% of participants stated they had reliable technology and internet access at home and that their school district had done something to address the need for technology. 4% of participants stated they had reliable technology and internet access at home and that their school district had not done anything to address the need for technology. 4% of participants stated they did not have reliable technology and internet access at home and that their school district had done something to address the need for technology. Could this be correlated to participant economic status? As stated earlier, 4% of participants stated they made $20,000 to $40,000 a year. There were not participants who identified as not having reliable technology and internet access at home and their school district had not done anything to address the need for technology.

Participants were asked to share if they had a designated learning area, such as an office.

Q14 - Do you have a designated learning area (such as an office)?   Page Options ⌄
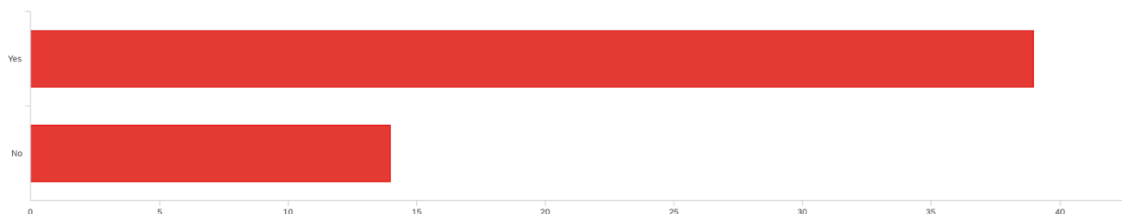

Figure 4: Designated Learning Area

As seen in Figure 4, 72% of participants stated they had a designated learning area, while 26% of participants did not.

Participants were asked to share how successful their student was completing their schoolwork this past academic year using a scale.

Q15 - How successful was your student in completing their schoolwork this past academic year?   Page Options ⌄
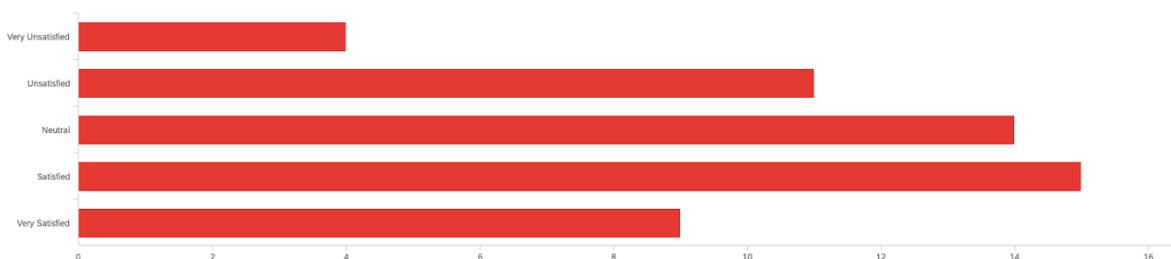

Figure 5: Measuring Academic Performance

As seen in Figure 5, 7% of participants stated that they were very unsatisfied. 20% of participants stated that they were unsatisfied. 26% of participants stated they felt neutral. 28% of participants stated they felt satisfied. 17% of participants stated they were very satisfied.

Participants were asked to share whether they found distance learning to be as beneficial as in-person, traditional learning.

Q16 - Do you find distance learning as beneficial as in-person learning?   Page Options ⌄
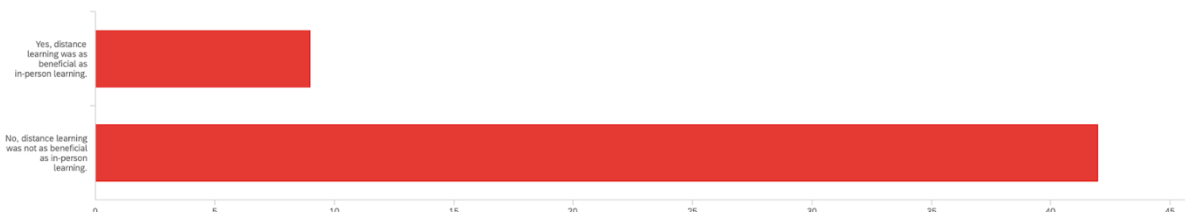
Figure 6: Comparing Distance Learning to In-Person Learning

As seen in Figure 6, 17% of participants found that distance learning was as beneficial as in-person learning, while 78% of participants did not find distance learning was not as beneficial as in-person learning.

Participants were asked to share whether they believed students would have learned as much if they were in a traditional classroom.

Q17 - Do you think you would have learned as much as you would have if you were in a traditional classroom?   Page Options ⌄
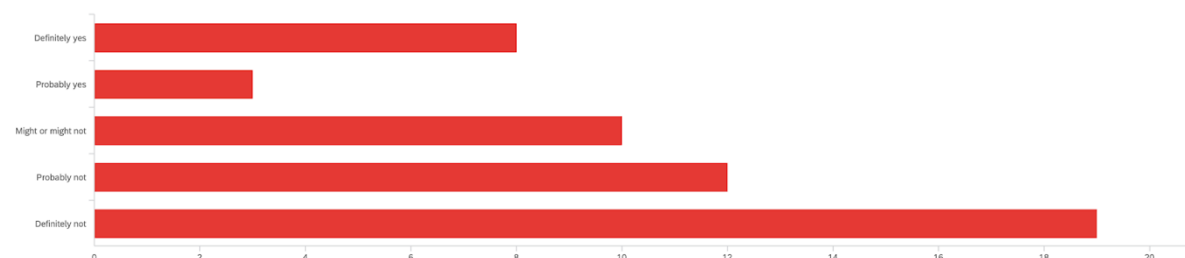
Figure 7: Comparing Traditional Classrooms to Virtual Classrooms and Academic Success

As seen in Figure 7, 15% of participants definitely believed they would have learned as much if they were in a traditional classroom. 5% of participants probably believed they would have learned as much if they were in a traditional classroom. 19% of participants believed they might

or might not have learned as much if they were in a traditional classroom. 22% of participants probably would have not learned as much if they were in a traditional classroom. 35% of participants definitely believed they would have not learned as much if they were in a traditional classroom.

Discussions/Limitations

As seen in the results collected from the data, most participants consisted of parents and teachers. However, there were a couple of administrators that participated in this survey as well. Out of all participants, most identified as middle class. Additionally, most participants seemed to have similar experiences when accessing digital technologies needed to participate in distance learning. It is important to remember that while most participants had similar experiences, some did not.

As illustrated in charts presented earlier, most participants described their experience with digital technologies and distance learning as negative. Some of these reasons included participants feeling that the 2020-2021 academic year felt like a gap year. Participants described feeling this way because their students were not learning as much as they did in person. There are multiple reasons that participants listed for feeling this way. Most shared that their students felt unmotivated since they were not in the classroom. Since students felt unmotivated, this led to students falling behind academically.

Students did not want to participate in virtual class meetings via Zoom or Google Meets and, in some cases, would skip the class altogether since there weren't adults present at the time of the meet. This led to students falling behind academically, since they were missing their virtual classes. Another reason for students started falling behind was lack of participation. Students were not participating in class discussions and assignments. Due to all this, participants

felt that students would need supplemental classes to make up for the academic year. Some

participants shared interest in having summer school options for students, while others implied

their students would be redoing the academic year altogether.

Since students were not present in a traditional, in-person learning environment, such as a

classroom, participants worried this was affecting student maturity and emotional growth. Some

participants shared that their students were becoming socially anxious due to lack of social

interaction with other students their age. Due to the ongoing pandemic and distance learning,

students were unable to have face-to-face interaction with other students. This led to some

students becoming sheltered and having a personality change. Participants worried that this

would affect their students when they returned to the classroom.

As seen in the feedback collected from the survey, most participants had a negative

experience with digital technologies as it relates to distance learning. However, it is important to

note that while the majority identified as having a negative experience, 35% of participants

stated they would participate in distance learning if offered again.
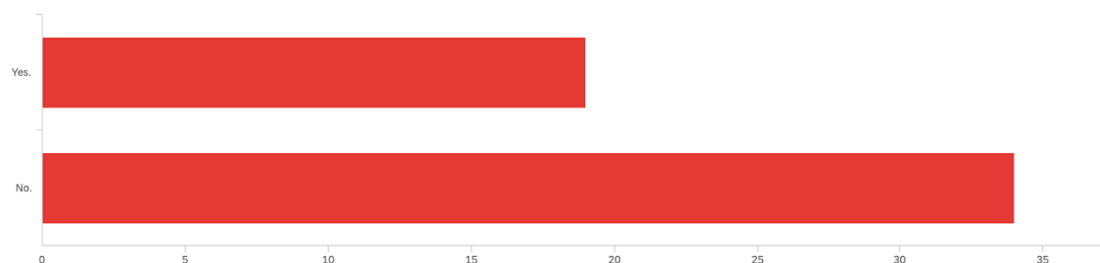
Figure 8: Participants Opinion on Distance Learning

As mentioned earlier, some participants did not have a negative experience with digital learning.

Instead, they indicated they would have their student participate in distance learning if offered

again. For some students, distance learning allowed them to participate in their classes and homework assignments on their own time. This could be because some school districts implemented asynchronous days into the week. Unlike before where students were struggling with time management, students were able to turn in their assignments on time. Some participants shared that they had never seen their student excel in school as much as they did during distance learning.

While this survey has highlighted that all participants [and students] have had different experiences when accessing digital technologies as it relates to distance learning, it is important to compare and contrast results with prior academic literature presented on this topic. Both the feedback and data found in this survey, as well as prior academic literature, do not favor one form of education over another. Both traditional, in-person learning and virtual, distance learning have their pros and cons, as seen in this survey and prior academic literature.

As seen in the literature presented earlier, some students favored traditional, in-person learning to virtual, distance learning. Both the research and academic literature presented earlier share common reasons for participants favoring traditional, in-person learning. A common theme throughout both is the importance classroom environments have on student success. In a traditional classroom, students are able to grow academically and emotionally. Students are receiving in-person instruction, as opposed to virtual instruction. This allows students to engage with the content better since teachers, support staff, and classmates are able to help students clarify any content that might be confusing for students. It's also important to note that students are able to interact with other students. This allows students to grow and to develop their motor skills as well as develop social skills. When students are placed in a learning environment which is positive and which supports them, students are able to learn their best.

As seen earlier in the research, not all students have a designated area where they are able to participate in virtual class meetings and/or assignments. As seen in this article, classroom environments have a bigger impact on student wellbeing and success than expected. "Students' values, motives, higher-order goals, and the means-ends relations in their goal system (motivation and learning strategy use) have been found to gradually shift by being exposed to learning environments (classroom contextual factors) that are structured according to the principles of social constructivism and consistently work towards developing a community of learners (constructivist teaching and learning practices)" (Milner et al., 2011, p. 152).

With this information in mind, it is crucial to compare participant responses to academic literature. In both examples, participants and researchers shared that the classroom environment was the biggest factor that contributed to student success. Participants who participated in the survey stated that because students were not in a traditional classroom, students felt unmotivated to participate in classes and assignments. As seen in the literature, classroom environment has a role in student success. Though the physical setting of a classroom is important, the people found within the classroom--such as teachers, paraprofessionals, etc., -- all have a role in motivating students to succeed. Additionally, they are there to help students if they do not understand a concept, unlike at home where some students do not have adults present when working virtually.

Though prior academic literature and research favor traditional, in-person classrooms, there are a couple of participants and researchers that state the benefits that virtual, distance classroom offers outweighs being in a physical classroom for them. To begin, it is important to understand what makes virtual classrooms so favorable. In some cases, students are able to participate in their classes asynchronously which allows them to complete classwork on their own time. For students who need to have a flexible schedule, either due to sport commitments,

health conditions, etc., this is a massive benefit that outweighs being in a traditional classroom. When researchers interviewed teachers on what made virtual classrooms so favorable, teachers credited the fact that students were able to have flexible schedules (Cakiroglu, 2014). Teachers stated that their students liked being able to complete assignments on their own time, but that in return teachers were given unattainable times in which they needed to provide feedback. Other reasons that participants and researchers noted that virtual classrooms were preferred to traditional classrooms is the fact that shy/reserved students were able to participate better in their classes. This could be because students are not required to have on their webcam or mic.

When comparing the research presented here as well as prior academic literature, it is important to remember that while all participants had different experiences, both tradition, in-person classrooms and virtual, distant classrooms are not new concepts. They were both schools that existed prior to the pandemic and that will continue to exist afterwards. To some individuals, the benefits of a virtual, in-person classroom will always outweigh those of a virtual, distant classroom and vice versa. It is important to consider the research and academic literature that exists when making decisions for one.

Though there was significant research and academic literature present in this paper, possible limitations of data and findings include insufficient feedback from participants who preferred distance learning over traditional classrooms. As seen throughout this paper, most participants and present academic literature suggests that most individuals prefer traditional classrooms because of the benefits it entails. However, knowing this, it is also important to consider participants and academic literature that favored virtual, distant learning to traditional classrooms because of the benefits it offers.

One possibility to address this issue could be to create a survey that caters to individuals who participate solely in virtual, distance learning. The individuals who would participate in this survey would be individuals who participated in this form of education prior to the pandemic and who will continue to do so afterwards. Like this, more research and data would be gathered from these participants as to why they continue to prefer virtual, distance learning. However, from looking at past surveys and academic literature, it is assumed that these participants would have similar feedback to those who already participated in this survey.

Conclusion

There are multiple questions that future researchers could research in regard to digital technologies as it relates to distance learning. With the increase of technology use both in and outside of the classrooms, are schools better prepared now [than a year ago] to provide technology to their students? Has the use of technology [during the COVID-19 pandemic] changed the future of curriculum and assessment? While these are both possible questions, it would be interesting to learn more about how distance learning has changed the traditional school system.

First, will school districts adapt to the changes distance learning has presented? Some schools introduced asynchronous days as a part of distance learning. On these days, students would complete work on their own time, without having to participate in a live class. Simultaneously, teachers would take this time to lesson plan, grade assessments, and attend school meetings and/or professional development. Asynchronous days allowed both teachers and students to catch up on material, while remaining productive. Some school districts, like Spotsylvania County Public Schools, has already introduced this idea for the 2021-2022 school

year. However, it would be interesting to see how other school districts, both nationally and internationally, plan to adapt to the changes distance learning has presented.

Second, will schools include distance learning as an option for students who preferred this method of education? As seen in both academic research and the results from the survey, there were some participants that preferred distance learning to traditional learning. This could be for multiple reasons. Will schools provide an option for parents to enroll their students in distance, virtual learning? As seen in research, some students excelled academically in this learning environment. While online schools are not a new concept, will public school systems make this type of education an option and/or choice for parents?

In conclusion, the research presented in this paper as well as the academic literature available on this subject matter both indicate that most participants favor traditional, in-person learning to virtual, distance learning. Research suggests that when students are able to perform better-- both academically and emotionally -- when in a physical classroom. The benefits of being in a physical classroom outweigh those of a virtual classroom for most students. Students are able to focus on their academic performance without interruption from outside factors.

Since the ongoing pandemic forced millions of children to adapt a new learning style-- virtual, distance learning -- the purpose of this paper was to look at how schools have addressed the need for technology as it relates to distance learning. As seen throughout this paper, most participants were provided technology and internet access for distance learning. However, other factors contributed to poor academic performance. By looking at the research conducted in this study and at prior academic literature on this subject, it is important to note that most students performed better, as well as preferred, being in a physical classroom.

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Appendix A

Addressing Digital Technologies Needed for Students in K-12 Schools

SAMPLE INFORMED CONSENT FORM

Brief Description

The purpose of this research is to investigate how K-12 schools have addressed the needs of all students in their school districts equally as it relates to access for appropriate technology for distance learning. Individuals who volunteer to participate in this study will answer relevant survey questions. The survey is anonymous, and it will take about 10-15 minutes of your time. There are few, if any risks to participants in this study. There are no direct benefits or rewards for participants in this study. **Please read the remainder of this form before deciding if you want to volunteer to be in this research study.**

My name is Tiffany Tueros I am a graduate student at the University of Mary Washington in Fredericksburg, Virginia, and I am seeking your consent to participate in this research study. Involvement in the study is voluntary, so you may choose to participate or not. The information below explains the study in detail. Before volunteering, please ask any questions that you may have about the research; I will be happy to explain anything in greater detail.

Details of Participant Involvement

I am interested in learning more about how K-12 schools have addressed the needs of all students as it relates to appropriate technology for distance learning. I am also interested in learning how K-12 schools can prepare for unforeseeable crises which require the use of technology for distance learning. If you agree to participate, you will be asked to answer multiple-choice,

ranking, and category scale (agree/disagree) style questions. Questions will also include demographic data about your role as either a parent, teacher, or both; and will also ask about employment status, care status of the children, number of children in the home, etc. Questions will be formatted to specific audiences of parents and/or guardians.

Privacy and Confidentiality

All information about participants is entirely anonymous. This means that your name or other identifying information will not appear in any data collected or in any reports of this research, and neither I nor anyone else will know your identity or be able to associate you with your data. When the research is complete, I will destroy all participant data.

Risks and Benefits of Participation

The only foreseeable risk to participants in this survey is possible discomfort in answering survey questions about your personal opinions and experiences online. However, you do not have to answer any questions you do not want to answer. The benefit of this research is that it may contribute to better general understanding of parental perspectives of distance learning. It may also provide greater insight into what K-12 schools can do to address the needs of all students as it relates to appropriate technology for distance learning. There are no direct benefits to you as a participant.

Participant Rights

If you do not want to participate in this survey, there will be no penalties. As a voluntary participant in this research, you have the right to refuse to answer any questions. This research

has been approved by the University of Mary Washington Institutional Review Board, a committee responsible for ensuring that the safety and rights of research participants are protected. For information about your rights as a research participant, contact the IRB chair.

Contact Information

For more information about this research before, during or after your participation, please contact me ttueros@mail.umw.edu or my university supervisor, Dr. Guth. To report any unanticipated problems relating to the research that you experience during or following your participation, contact my university supervisor, Dr. Guth.

To be Completed by Participant

I have read all of the information on this form, and all of my questions and concerns about the research described above have been addressed. I choose, voluntarily, to participate in this research project. I certify that I am at least 18 years of age.

Select option:

- Yes (continue to survey questions)
- No (close the survey website)

If respondents select "No," the survey will be terminated using Qualtrics' skip logic technology. If respondents select "Yes," they will move ahead to Q2.