The Failings of Online Learning for Elementary Education during the Covid-19 Pandemic

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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STS Research Paper

Impact of Covid-19 on Elementary Education

The desks are empty, the classrooms are still, and the hallways are quiet; this description is not something that would often be associated with elementary schools. In the spring of 2020 these words describe 124,000 schools throughout the United States (Map: Coronavirus and School Closures in 2019-2020, 2021). As the Covid-19 pandemic swept across the nation schools were shut down in order to ensure that children and teachers remained safe. However, schools could not stay closed indefinitely, the solution was to transfer in-person classes to online. While online school became a solution to a daunting problem, it did not successfully ensure that elementary students received the same level of education that they would have previously received in-person. Online school was a new experience for many teachers, students, parents, and administrators. Before the pandemic hit, 92.4% of PreK-12th grade teachers had never taught online school (Marshall et al, 2020). The challenges that were faced when the transition to online elementary school occurred resulted in many problems developing throughout the school year. Through the research gathered about how and why these problems occurred the United States education system will learn how to better transition to a new type of learning if another crisis would arise in the future. This paper uses the paradigm shift theory to analyze the unsuccessful transition to online elementary school by exploring the reasons behind why a paradigm shift did not occur when it comes to teaching elementary education. The information collected and analyzed in this paper will answer the following question: How was the United States reliance on computers during the Covid-19 global pandemic a failure for elementary education?

Discourse Analysis on the Effectiveness of Online Elementary Education

This paper uses discourse analysis to answer the research question. In the following pages numerous news articles and journal entries have been analyzed to determine how effective online school was compared to in-person school. One type of source that is analyzed throughout this paper is news articles that discuss how students, teachers, parents, and administrators handled the change to online school. These news articles consist of not only observations conducted by these individuals but also their opinions about the shift to online learning during the pandemic. Another source that is analyzed is statistical data that was collected about elementary students' test scores during the pandemic compared to pre-pandemic scores. The data gathered about how students placed within the different subjects indicate how effective online learning truly was. The news articles and statistical data are analyzed to determine why a paradigm shift did not occur in relation to the manner in which elementary education is taught in the United States.

Elementary Education in the United States

As far back as 1635, early education in the United States consisted of children traveling to schools and classrooms in order to receive their education (First Public School in America, 2013). By 1918, all children were required by the state to complete at least elementary school (11 Facts About the History of Education in America, 2015). Elementary school has been deemed necessary for all children due to it being considered "the most influential institution in children's lives" after family (Bennett, 1986, p. 1). Both the curriculum taught and the atmosphere found within elementary schools help children develop "a strong foundation for further education" (Bennett, 1986, p. 2). The United States has relied on elementary educators to start children on their learning experience for the past couple centuries.

However, in the Spring of 2020, the United States educational system experienced a major crisis. The first case of coronavirus was confirmed in the United States on January 21, 2020 (Mullen et al, 2021). That one case quickly caused Covid-19 to spread throughout the United States, and before long the world was facing a global pandemic. The Covid-19 global pandemic was wreaking havoc on the United States health system and it was deemed no longer safe for students and educators to attend in-person school. A solution for how students would continue to receive their education had to be found, causing the United States to see a drastic shift in their educational system. In-person schooling was moved to online. Some schools began to use numerous video call platforms, such as Zoom, while other schools took an asynchronous approach and sent links to videos and lesson for their students. A survey completed by the United States Census Bureau found that at one point during the pandemic "93% of households with school-age children" were using some type of distance learning (McElrath, 2020). Out of that 93%, 80% were using online resources as a substitute for in-person classes (McElrath, 2020). The United States educational system was experiencing a shift that required a new reliance on computers to ensure that students were continuing to receive their education.

While the shift to online school appeared to be the solution to a daunting task, problems began to develop within the educational system. For the past century, educators have been trained to educate their students through an in-person setting. When the Covid-19 pandemic hit the United States, only 7.8% of PreK-12th grade teachers had ever taught online school before (Marshall et al, 2020). Educators were responsible for not only continuing to teach their students, but they also had to learn a new method of instruction. Schools' administrators were responsible for ensuring that all of their students had access to both computers and the internet. Many elementary students had to learn how to use the new technology presented to them. Parents were

now not only responsible for ensuring that their children arrived at school, but they also had to ensure that their children were able complete all of their different school tasks throughout the day. The numerous challenges that educators, administrators, students, and parents faced with this shift to online learning resulted in a form of elementary education that was lacking compared to previous years.

Paradigm Shift and Online Elementary Education

The research question is addressed through the application of the STS theory known as the paradigm shift theory. The term paradigm shift theory is attributed to Thomas Kuhn, a philosopher of science (Thomas Kuhn, 2018). Kuhn defines a paradigm shift as the evolution of a way of thinking (Kuhn, 2012). A paradigm shift occurs when there is a shift in the way society does something or how they think about or view something. When the paradigm shift is applied to a particular event it can be broken up into the Kuhn Cycle. The Kuhn cycle is made up of four different phases: normal science, model drift, model crisis, and model revolution (McLeod, 2020). The normal science phase is when a paradigm is established and it successfully meets the requirements set by society (McLeod, 2020). Then the model drift phase occurs when anomalies to the paradigm become noticeable (McLeod, 2020). A model crisis will occur if the present paradigm can no longer handle the anomalies and failure begins to occur, resulting in a model revolution producing a new paradigm that can regulate the anomalies (McLeod, 2020). Through the different phases of the Kuhn Cycle the process related to a paradigm shift can be observed. Observing a possible paradigm shift through the use of a Kuhn Cycle helps to determine if all of the different phases were completed to achieve a paradigm shift or if the possible shift was paused within one of the phases. Applying the Kuhn Cycle to the shift to online elementary

school helps determine if this shift effectively traveled through all of the different phases resulting in a paradigm shift.

While Thomas Kuhn is the main contributor of the paradigm shift theory there are numerous authors that disagree or critique Kuhn's theory. One author that critiques the paradigm shift theory is Thomas Kuhn himself. While Kuhn established the paradigm shift theory, he admits that his theory is vague, he states that his theory has created "gratuitous difficulties and misunderstandings" (Kordahl, 2018). Throughout his writings, Kuhn never truly defines all of the different aspects of paradigm shifts. The vagueness related to the paradigm shift theory allows for different interpretations and applications. Another author that disagrees with Kuhn's paradigm shift theory is Steven Weinberg, a Nobel Prize-winning physicist. While Kuhn believes that when a paradigm shift occurs the old way of thinking is forgotten, Weinberg disagrees (Kuhn, 2012). Instead, Weinberg believes that a paradigm shift actually adds on to the ideas that already exists rather than replacing the old ideas (Weinberg, 1998). Weinberg presents the example of Newtonian physics still being taught to new physicists despite a paradigm shift that happened resulting in a new way of thinking about physics (Weinberg, 1998). When determining if a paradigm shift occurred it is important to determine whose teaching should be followed. The vagueness of Kuhn's theory allows for varying interpretation of whether a paradigm shift occurred within the educational system. Therefore, making it important that this paper clearly elaborates on why it believes a paradigm shift did not occur within the elementary education system during the pandemic.

Since the start of the Covid-19 global pandemic, there has been numerous examples of paradigm shifts that have occurred within society. Paradigm shifts have been seen within job security, financial consequences, remote work, and more (Buckley et al, 2021). When analyzing

these different paradigm shifts a key takeaway related to how to determine if a paradigm shift occurred is to look at the long-term implications and whether these changes will remain in effect in the future (Buckley et al, 2021). In looking at the long-term implications and the longevity of online elementary school this paper analyzes why a paradigm shift was not effectively completed within the educational system.

Failures of Online Elementary Education during the Covid-19 Pandemic

The sudden switch to online learning resulted in a failure to educate elementary students in the United States. The switch to online school initiated a new Kuhn Cycle and the potential for a paradigm shift. However, after analyzing teachers', students', and parents' observations and opinions as well as the test scores that were gathered during the pandemic a clear picture is painted as to why the Kuhn Cycle was not completed. Once the Covid-19 vaccine was successfully created and administrated to elementary teachers, in-person schooling resumed due to elementary students falling behind previous years as a result from the switch to online education.

Before the Covid-19 pandemic, the majority of public elementary education was taught in-person as it had been for the past couple centuries (First Public School in America, 2013). Before 2020 there were a few online schools. In-person elementary education was the normal science stage in the Kuhn Cycle. Teaching elementary school in-person was a method that had been effectively used for hundreds of years.

The Covid-19 pandemic caused both a model drift and a model crisis to occur for in-person elementary education. At the start of the pandemic cases were rising on average between 20,000 to 30,000 new cases a day (Coronavirus in the U.S.: Latest Map and case count, 2020).

Within crowded classrooms where germs were known to easily spread, Covid-19 would flourish and cause a devastating increase in the number of cases. Covid-19 was a new virus that did not have effective treatments or preventive measures in place during the spring of 2020. The lack of a treatment caused in-person schools to pose a threat to the health of not only the teachers and students but also the parents who would be exposed to the virus if their children brought it home from school. In-person education was not able to meet the challenges presented by the Covid-19 pandemic resulting in a model crisis (Khettab, 2020). Elementary school had been taught in-person for almost 400 years, but in the spring of 2020 a model revolution began to occur within the United States educational system (First Public School in America, 2013).

Students were sent home from schools and a new method of teaching had to be implemented to ensure that elementary students across the United States did not fall further behind. The method that was proposed was online school. Online school would not only allow students to continue their education but it would also help protect teachers and families from being exposed to Covid-19. Through the use of computers and the internet teachers would be able to give their lessons to their students while still interacting with them in a safe manner. Online school was the model revolution for the United States elementary education. However, the model revolution stage is where the Kuhn Cycle paused for elementary education's method of instruction and a paradigm shift did not occur.

While the shift to online school was deemed necessary to ensure the health of the teachers, students, and their families, the quick shift to a new form of teaching and learning caused many challenges to arise. After having taught elementary school in person for so many years, online learning was a new experience that many schools did not know how to handle. Rebecca McKeon, a kindergarten teacher, says how teachers at her school were instructed to not

teach anything new online, they were only supposed to review old lessons (Arthur, 2020). The administrators at her school felt that it would be too hard to teach anything new through Zoom due to the reduced instruction time and the shortness of elementary students' attention span (Arthur, 2020). This mindset was not only found at Warren Elementary School where McKeon taught but could also be seen across the United States. The attention span of young children has always posed a problem to ensuring that lessons were taught in a manner that allowed students to absorb all of the information that they were being exposed to. Many elementary schools were concerned with the attention span of their students when it now came to online school. However, in only reviewing what students had already been taught elementary students fell even further behind within their education. Online learning was supposed to ensure that elementary students continued their education not just relearn what they had already been taught. The lack of new material being taught was far from being the only problem that came with the quick shift to online school.

In order to teach using online school, elementary students had to have access to a computer. Gaining access to a computer posed a problem for many low-income families. Kaitlin Barnes, a fourth-grade teacher, stated how "over 80 percent of the students at my school come from low-income families, and only a quarter of my students have a computer at home" (Teachers and Students Describe a Remote-Learning Life, 2020). Before the pandemic, students from low-income families were already often behind their wealthier peers in school, and the lack of access to computers would cause them to fall even further behind. A study measuring the progress of young students in math and reading found that during the pandemic their progress had slowed (Barnum, 2021). The data collected also showed that the students who experienced some of the greatest declines in their math and reading skills were students that were either

Black, Latino, or from low-income families (Barnum, 2021). Online school put low-income students at a greater disadvantage than ever before.

In the past couple decades, the United States educational system has tried to ensure that lessons are taught in a manner that ensures that all students succeed, that all students would receive the same education (Every Student Succeeds Act (ESSA), n.d.). As voiced by teachers and evidenced in studies, online school did no accomplish equal education for all students. The Northwest Evaluation Association (NWEA) collected data that showed that a typical fifth grader during the pandemic at an affluent school experienced a drop of seven percent in math (Barnum, 2021). While a fifth grader that attended a low-income school experienced a drop of 11 percent in math (Barnum, 2021). The data collected by the NWEA shows that the switch to online school during the pandemic caused students math skills to decrease, but it also showed a more prominent decrease for students from low-income families. Thus, not effectively meeting the United States educational system's goal of ensuring that all students are presented with a chance to succeed.

Teachers and parents also found it challenging to not only teach through the different online platforms, they also found it hard to control students through the computer. Gretchen Lippincott, a kindergarten teacher, spoke about how "online learning is not a one-size-fits-all" (Arthur, 2020). Lippincott found that it was a different experience for each student. Some students would not show up to school because their parents were working and unable to help them get on Zoom, while other students would experience technical difficulties that they were incapable of fixing (Arthur, 2020). For elementary students who have not previously relied on computers as much with their education the switch to online school was something that they were often not capable of doing without a parents help. However, like Lippincott stated, some

students' parents were essential workers and unable to take off to help their children when it came to using the different online learning platforms (Arthur, 2020).

Janet Kass, a first-grade teacher who is 66 years old, spoke about how this switch to online school was like "attempting to drive on a road that I am simultaneously paving while also following a paper map" (Teachers and Students Describe a Remote-Learning Life, 2020). Online learning was a new experience for teachers and students alike. For both older teachers and younger children who are not quite as exposed to using computers as the rest of society the switch to online schooling was a new learning experience. Learning how to use to computers and online platforms added additional stress to students who were also learning new topics in class.

Thomas Courtney, an elementary teacher, even went on to state that he is "a much better teacher in the classroom" (Courtney, 2021). While in the classroom Courtney was able to ensure that his students were learning. If a student is not learning during a certain lesson, then the teacher can immediately alter it to make it effective for that particular student (Courtney, 2021). Teachers have more control over their classroom while in-person, they do not have students muting themselves or leaving the Zoom room when they no longer want to participate in class. They do not need to rely on having parents ensure that their children know how to access all of the online materials on their computers and are able to join the online classroom whether that be through Zoom, Google Classroom, or another platform. While in-person, teachers and schools are able to ensure that students receive all of the support and help they need. Online schooling relies a lot on parents being able to offer support to their children which they are not always capable of doing. A survey completed by the Pew Research Center showed that in lower-income families, 72% of parents had to offer additional instruction to their children, and in upper-income families, 58% of parents had to offer additional instruction to their children (Horowitz &

Igielnik, 2020). Online instruction was not able to supply the support and resources that young children needed resulting in parents taking on some of the responsibilities of teachers and administrators.

Online learning did not meet the demands that came with teaching elementary students, resulting in lower achievement scores in varying subjects. Data collected by Curriculum Associates, a curriculum and associate provider for schools, found that fewer elementary students than ever before were no longer on grade level when it came to both math and reading (Schwartz, 2021). In a survey completed by EdWeek Research Center, almost 80% of teachers, principals, and district leaders found the test results for elementary students' math and English to be either very concerning or somewhat concerning (Schwartz, 2021). As evidenced by the low-test scores and further emphasized by teacher's and parent's observations online education was not working out for elementary students. Elementary students were falling further behind when compared to previous years that were taught in-person. The challenges that came with using computers to teach elementary students resulted in the decision to not continue to use online learning for elementary education once it was deemed safe enough for schools to resume in-person teaching. In the late fall of 2020 and the early spring of 2021 many elementary schools made the move back to in-person teaching.

The Kuhn Cycle remained unfinished and a paradigm shift did not occur when it came to the way in which elementary education is taught. An incomplete Kuhn Cycle signifies that online learning does not meet the needs of society when it comes to the United States elementary education. The Covid-19 global pandemic was an anomaly for elementary education that resulted in the education system shifting to online learning as a new method of instruction. However, after implementing the new method of instruction, the United States educational system

discovered that despite the Covid-19 pandemic in-person schooling continued to be the method that best met the requirements society had set for elementary education. Online learning was unable to ensure that students did not fall behind in their education, conveying the need to resort back to the normal science stage, in-person teaching, despite the anomaly known as the Covid-19 global pandemic.

Research Limitations

There were a few limitations within the research conducted for this project. The focus of this research was solely on how the reliance on computers effected elementary education. Elementary education often does not rely on computers as much as middle school, high school, or college. While online education does not appear to work for elementary school this does not mean that it cannot be effective for higher levels of education. More colleges are offering online options for classes after the pandemic than ever before. Another limitation to this research is, while opinions about online school was gathered from parents and teachers there were not many resources that presented elementary students' opinions. There were opinions from middle school and high school students, but due to their young age elementary students were not often interviewed about how they felt about online education versus in-person education. One more limitation of this research is there is no way to determine all of the factors that effected students' test scores. Test scores could have not only been impacted by being online, but students could have received help from other sources without teachers being aware (Courtney, 2021). The data collected also does not show how stress from the pandemic impacted the elementary students' learning experience.

Future Research on Online Elementary Education

Further research on this subject could involve testing how online school works for elementary education when there is no global pandemic occurring at the same time. While many of the shortcomings of online elementary education came from the lack of control as well as the preparedness of the schools and homes to incorporate online school into their daily life, the global pandemic could have also played a role on the test scores that were collected and evaluated. Not only were elementary students experiencing the pressure of attempting to use a new form of instruction, students and teachers also had to deal with the stress of the pandemic. The stress of the pandemic could have not only affected how well teachers taught but also how focused the students were on their schoolwork. The Horace Mann Educators Corporation discovered that during the pandemic 1 in 4 teachers were considering quitting (Courtney, 2021). The stress of the pandemic and quick shift to online school created a large amount of pressure on elementary teachers. By analyzing how well online elementary school works when the added stress of the pandemic and the pressure of a quick shift to a new platform does not exist, one can determine whether online elementary school could ever truly be successful, or if in-person education will remain the paradigm for elementary education in the future.

Elementary Education in the Future

Elementary education was not able to successfully rely on computers to ensure that students would continue to receive an effective education due to the unpreparedness of schools as well as the loss of control that teachers experienced when it came to teaching through a computer. The switch to online learning challenged many families when it came to finding and maintaining access to a computer. Elementary teachers were also no longer the only people supplying assistance to their students, parents were required to offer further assistance from

home. In the future, if another crisis would occur that results in in-person education no longer being acceptable, then the United States educational system needs to analyze what went wrong with the switch to online learning in the spring of 2020. If the United States educational system could counteract some of the many problems that arose when it came to online learning, then in the future they can ensure that students will not fall behind previous years due to a crisis. The elementary education system will then be able to maintain their goal of ensuring that all of their students are succeeding.

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