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### **The Effect and Effectiveness of Remote Learning**

**Abstract.** Over the course of the last several months, education systems around the world have had to quickly adapt to the growing impact of COVID-19 on the schooling of children. As many districts switched over to remote learning, there are still many imperfections in the virtual system. New research has indicated that remote learning has caused an increase of educational inequalities between well-off students and their disadvantaged counterparts, leading to the widening of the achievement gap teachers have been working hard to narrow within the classroom. There has been a recent collection of data regarding access to technological material, an appropriate learning environment, and resources that students need to succeed at the same standard they did previously in-person. This paper aims to take that research, along with a study surveying high school students currently learning online, to understand the effect and effectiveness of remote learning. When conducting this research, the ultimate goal was to see what countries around the world were doing to best accommodate their students learning from home. Moreover, based on the information and current studies regarding the pandemic and education, this article hopes to offer some suggestions that districts and governments can consider in order to enhance the learning experience during such a difficult time.

There have been many shifts in the education systems over the course of several years, but the transition to remote education during the last six months and its continuation throughout the remainder of the year has been a change like never before in global history. As cases of COVID-19 increased rapidly, school districts were forced to quickly adapt their methods of teaching into one that is fully online for both students and teachers. While remote teaching was one of the only methods to continue educating children in a safe manner, its implications and effects were not, and still remained, unclear. As the one-year anniversary of school shutdowns quickly approaches, there are many technological adaptations still being made and the continuous social and psychological effect on all parties involved remains a short and long-term concern. In this article, the effects and effectiveness of remote learning will be navigated from different directions, and viewed from the perspective of teachers, student teachers, and students in order to create a well-rounded report on what remote teaching during the coronavirus has taught us about our educational systems.

One of the main goals that is consistently on the mind of educators is to close the gaps between students that exist in every system; this includes issues such as the racial, gender, and cultural gaps in education where students, typically representing the minority, are not able to perform as well as students who represent the majority in terms of wealth, race, gender-dominance...etc.

Due to COVID-19 leading children to be homebound for school, the educational inequalities with regards to socioeconomic differences has increased dramatically. Haven spoken to parents of lower income status, there was an overwhelming response of wanting their children to go back to school in-person as soon as it was safe enough. From an outsider's point of view, one may be taken aback by the number of parents who want to send their children to school during a pandemic. However, schools provide resources that many students do not have access to at home which gives students, regardless of socioeconomic status, the equitable opportunity to succeed alongside their well-off classmates.

A recent study of over 2,577 schools across the countries of Germany, Italy, France, Spain, and the United Kingdom have concluded through extensive research that educational inequalities are branched from four major categories: students not having access to (1) internet, (2) computers, (3) a quiet place, and (4) ICT (Information and Communication Technology). (Murat & Bonacini, 2020). Though many schools have begun introducing individualized technology, through the use of laptops/Chromebooks and tablets, it is safe to say that most districts were not prepared to assign each student their own device that they would be able to take home for the year. Many schools who are gradually receiving funding for such technologies typically have a certain number of devices assigned to the entire school, and this limited number is rotated on a schedule between groups of classrooms. As a result, many schools did not have the immediate ability to provide devices for every student; this meant not only did administrations have to quickly gather numbers of how many students did not have access to computers, but teachers also had to learn how to accommodate students with different device models at home in order to appropriately provide the technological support needed. Christopher Tienken (2020), an associate professor at Seton Hall University, took a closer look at the technological viewpoint of educational inequality and reported that out of the 56 million students in the US who were unable to attend in-class instruction, 6% only had access to internet via a smartphone which is unequipped for effective learning. (Data retrieved from NCES, 2020).

While schools were slowly shutting down, workplaces closely followed in those footsteps and the number of people at home during children's school hours increased; with more people at home joining meetings and calls online, home environments have become less of a quiet place and more like a busy office. The lack of a dedicated, quiet area at home for students can increase the likelihood of inattentiveness and thus decreasing quality time for learning material and developing fluency. Murat & Boncini (2020) highlighted that, "students not having a quiet place to study are more likely to shorten their planned length of studies and-or of repeating grades", and negatively correlated the lack of a quiet place with limited access to resources. Students who come from low-income households are the typical population at risk; having reduced access to educational tools such as tutors, programs, and other educational activities only contributes to the widening of the gap educators have worked hard to narrow within the classroom. Public schools in well-off areas in the United Kingdom, provide up to 15% more resources than their low income counterparts. (Andrew et al., 2020) This crucial statistic means that students who are financially well-off have the privilege to a quiet working area and resources which allows them to invest more time in their education.

In fact, Andrew et al. (2020) reported that well-off students spend an average of 75 more minutes each day than disadvantaged students, which translates to 5.8 hours of learning versus 4.5 hours per day. Over the course of 30 days in lockdown learning, students in well-off families will have accumulated 44 extra hours of learning, which is, "an equivalent to over seven full days of school". (Andrew et al., 2020).

The many obstacles that students from low socioeconomic status face all have a direct impact on the quality of their education and the value that students see in what they are learning. As conditions became unfit for some learning at home, students may feel unmotivated to pay attention in class as well as partake in educational activities outside of the virtual classroom. Moreover, factors such as the four listed above can cause an increase in student absence, and this may be an added detriment for students who benefited from.

Data and research from previous years allowed teachers, educators, and administrations to make educated predictions on how effective remote learning would be during this transitional year. However, one cannot truly understand the experience of a virtual learner without being one, and thus

the contribution and feedback of students has been more important than ever before. For this reason, I worked with a fellow high schooler in one of the public schools in New Jersey to gather some insight on how students are adapting and succeeding, or not succeeding, in their online classrooms. A survey was issued school-wide asking students to assess their educational experience online anonymously and the questions varied in topic including: stress level, work/homework load, responsibilities and commitments outside of school, and comments about teachers or administrators regarding how the shift to remote learning was being handled. A total of 122 students answered the survey; no data was collected for specific grade levels, race, or socioeconomic status. The school hours for this specific district was from 8:30 am to 12:30 pm, with office hours provided until 3:00 pm. About 65% of students indicated that, although schoolwork is necessary, they felt that there was an increase in busy work, and many attributed it to having a shorter school day. Students were asked to rate their workload on a Likert scale from 1 to 10, and 10 indicated extreme amounts of work; the average rating was 7.6. It's important to note here that there was no correlation between students who said they had busywork and students who expressed a large workload.

Students were asked to rate their stress level on a Likert scale from 1 to 10, and 10 indicated the highest level of stress; the average rating was 7.6. This prompted the concerning question of why the average rate was much higher than personally anticipated. To analyze this number, three follow up questions were prompted about: having a job or sport commitment, having time dedicated to oneself, and effective teacher/student communication. About 77%, representing 94 students, indicated that they have a sport, job, or other commitments outside of school; of those students, 62% of them rated their stress levels highly (7-10). Out of the 94 students who had other responsibilities, only about 15% said they felt like there was time to take a break and focus on their mental health; considering the total number of students (regardless of outside commitments), that number only increased to 19%.

Finally, the high school students were asked to rate how effective teachers are at emailing back and overall communication; the average rating given a Likert scale from 1 to 10 (10 being very responsive) was a 6.5.

It should be noted that the purpose of this article is not to scapegoat any persons for the high stress rates within students as this has been a year full of trial-and-error methods to find the best way for both teachers to teach and students to learn. There is no doubt that teachers have taken an enormous responsibility on their shoulders to continue teaching at the standard while being in a completely different medium, and talking with the staff of a K-2 school has uncovered that stress levels are also increasing at the teacher-level.

Students were given an opportunity at the end to leave any comments they felt the need to express and about half the students opted to; the majority of commentators sympathized with teachers but still needed to voice their concerns. Many students indicated that there was a common theme of being rushed, whether it was regarding homework, classwork, or the general online environment.

Students mentioned that, just like teachers, many dealt with technical difficulties, microphone malfunctions, and the slowing of their internet connection due to heavy use. It should not be expected for students to fully adapt to online learning much quicker while teachers are still experiencing flaws in the system. Students also mentioned that while they understand that homework is due the next day and they are responsible for completing it in a timely manner, teachers should hold a similar standard for grading. Not receiving grades for weeks at a time leaves students concerned with where they stand in class. Moreover, homework is an excellent method to see and address misconceptions early on, but

by the time the homework is graded, students have already used their misinformation multiple times which creates a weak foundation for more advance concepts looking ahead.

A concern that many students mentioned was the idea that they no longer receive breaks and are required to sit through all their classes until the end of the day. As someone who works at the elementary school level, this was a shocking discovery; all students, and arguably all adults, require what is referred to as a “brain break” at the K-2 level. Staring at a screen for 4+ hours straight while being taught new material the entire time is bound to exhaust and motivate just about anyone, and students are no exception.

There is no concrete solution as to how schools can mimic the same quality of education they provided in-person, but there are a few recommendations that governments, districts, and administrators ought to consider. Funding for education, pre-pandemic, was already a concern but with an increasing need for technological equipment, there needs to be a reevaluation of budgets that are allocated for schools to better accommodate parent and student needs at home. At a district and school level, educators should devise a plan to help provide learning material for students at home that they would typically receive in class. Some, but not all, districts have scheduled supply drives for students to pick up packets, books, and manipulatives to enhance the learning experience. Lastly, students need to take a break and there’s not much that needs to be said regarding this.

Teachers often talk about what events in their lifetime will likely appear in a textbook 10 years from now; not only will this remote education trial be written in history for years to come, but the efforts and contributions of countries, societies, and communities will be evaluated to see if students were given every opportunity to learn and succeed at home.

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