The State of American Education During the Covid-19 Pandemic: Survey of American Public, Private, and Charter School Teachers

Bec Nichele Smith, Dunia Hakim, Andrew Bassilakis, and Emiel Owens
Stanford University

The Covid-19 pandemic has caused school disruptions for over one billion students world-wide (UNESCO, 2020b). School buildings across the US closed in March, and 48 US states have ordered or urged schools to close their facilities for the rest of the 2020 school year (Education Week, 2020). Schools have shifted to online learning at home, and many have asked guardians to work with their children to aid learning (UNESCO, 2020a). In recent months, there has been much discussion about the potential effects of this mass transition to online schooling.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) warns of potential adverse effects that are "disproportionate for under-privileged learners who tend to have fewer educational opportunities beyond school" (UNESCO, 2020a). These adverse effects may include higher dropout rates, guardians unable to assist in their children's learning, and inefficiencies caused by setting up online learning infrastructure (UNESCO, 2020a). While some areas that are more accustomed to school interruptions, like districts in New Hampshire prone to snow-days, have already established online-learning programs, others lack such pre-existing infrastructure (Mineo, 2020).

In this paper, we seek to isolate the effects of internet access on education with a new survey conducted among American teachers. We consider how students and teachers are being affected in general by the transition to online learning and investigate inequalities among students' access to internet access and their ability to remain engaged in class. Prior research has examined how interruptions in schooling can disproportionately affect low-income students and students of color. While schools have not been closed, online learning may present degrees of interruptions for certain students; if, for example, they lack internet resources to download or engage with online materials. Understanding the effects of interruptions is important to recognizing the significance of unstable attendance or engagement due to internet-instability.

Literature Review

Interruptions in in-person schooling can harm long-term education and test scores, which disproportionately affects low-income students. A well-known result by Cooper et al. showed that "summer loss" – the diminishment of scores on the grade-level equivalent scale after summer vacation from school – was worse for low-income students than for middle-income students, particularly in math (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Carlsson et al. have shown that ten days more of schooling can yield increases of 1 percent of a standard-deviation on crystallized-intelligence tests taken at age 18 (Carlsson, Dahl, Öckert, & Rooth, 2015). Interruptions caused by internet access then may cause similar short and long-term knowledge and education gaps, especially if they create significant imbalances for subgroups of students.

We also must note that internet access may be less stable for low-income people and people of color than for middle to upper class people and white people. According to the National Center for Education Statistics, 6.1 percent of children aged 3 to 18 did not have any internet access at home in 2018. These statistics, however, are different for children from different racial and socio-economic backgrounds. 10.1 percent of Black children and 9.3 percent of Hispanic children lacked internet access at home, whereas only 3.8 percent of White students did. Further, 18.5 percent of children with parents who did not graduate high school and 14.6 percent of children with family income less than $30000 did not have any internet access (NCES, 2019). Finally, in 2017; 34 percent of those children 3 to 18 years of age with no internet access cited the financial cost for why they did not have a subscription (NCES, 2020).

Unstable internet access already causes educational problems and hassles. A Pew Research Center survey of students aged 13 to 17 found 17 percent could not complete assignments due to unreliable access to the internet or a computer. Again, this disproportionately affects students of color and students from low-income families: 25 percent of black students and 17 percent of Hispanic students had such issues compared to 13 percent of white students. 24 percent of those with family income of less than $30,000 responded affirmatively compared to 9 percent from those making more. Many of these students chose to use public WIFI sources (Auxier & Anderson, 2020). When such sources are inaccessible due to social-distance policies, ability to access or complete assignments may correspondingly diminish, which in turn may increase adverse effects.

Should internet-connectivity issues factor into quality of education or a student's ability to engage, those imbalances may create unequal educational outcomes along potentially socioeconomic or racial grounds. The US Supreme Court has labeled education "the most important function of state and local governments" and thus a civil right for all Americans (Supreme Court of the United States & Warren, 1953). In the face of such significance and the disproportionate nature of internet

inaccessibility, it is important to understand how internet connectivity issues affect education.

Notably, some programs have already begun providing computing resources and internet access to students. Boston Public Schools bought and distributed 20,000 laptops to students in need. Internet-service-providers and cellular companies are offering free unlimited internet to students in certain school-districts (Johnston & Vázquez Toness, 2020). Texas Governor Greg Abbott has launched a similar campaign to provide internet connectivity to every student (Office of the Texas Governor, 2020).

Without these programs though, the effects may be great. Even in homes with internet, the FCC has recommended creating "internet schedules" designed to limit demand on WIFI bandwidth (FCC, 2020). With high bandwidth requirements for video conferencing and streaming that may be utilized for online learning or telework; students – or even teachers – may have unstable connections, particularly if others in the household have inflexible schedules and bandwidth requirements.

In the following, we present a new dataset from surveys of American teachers. Our survey focused on the effects of internet access on education. We consider how teachers and students are adjusting to the new online platform, the frequency and significance of connectivity problems, and how teachers believe their students' education quality is. This dataset is a significant step in understanding the importance of having stable internet access amidst the COVID-19 pandemic. It is important that we be able to understand how common and serious such effects are and continue to be.

Method

An online survey was developed to gather information on the effects of internet access on the state of teachers' online instruction during the Covid-19 pandemic, incorporating the following areas: student participation, class disruptions, connectivity issues, curriculum changes, and other challenges. Data collection was done through the use of a Qualtrics online survey software and Excel. An electronic link to a Qualtrics survey was sent to participants and a snowball sampling procedure (Handcock & Gile, 2011) was used. In this case survey respondents were encouraged to forward the survey link to colleagues. The online survey was open for 4 weeks. The survey included 23 questions and was designed to be brief, increasing the likelihood of respondents (Fan & Yan, 2010). Wherever possible, the survey included follow-up questions with qualitative feedback which can be found in the appendix. The truthfulness of participants may affect validity, but anonymity mitigates its potential impact. Participation was completely voluntary; we did not offer survey participants any form of compensation. All completed surveys were included in the study. A total of 165 surveys were included in the analysis representing 22 states across the U.S.

Smith et al., American Education

Results

Table 1 reports the descriptive results of the survey. The first set of questions provide descriptive of the sample. The first question reports the distributions of teachers and the states they represent. In this case, Texas, followed by Iowa had the largest sampling of teachers to participate in the survey. For the state of Massachusetts, 17 teachers participated in the survey. The second item divides the states into regions of the country. North East represents states such as New York, Massachusetts and Pennsylvania. North Central states are represented by states such as Michigan, Ohio, and Wisconsin. Southern states were Texas, South Carolina, and Alabama just to name a few. Finally, Western states were represented by states such as California, Alaska, and Colorado. Item three on the survey asked teachers to indicate the school setting they teach in. In this case, school settings were public, private, or charter school. The results indicated that the majority of teachers worked in a public-school setting. The next two items ask the teachers to indicate the number of years they had been in the teaching profession. The minimum was one year and the maximum number of years was forty-two years. When years of teaching experience were categorized, the majority of teachers had been teaching between 11 and 20 years. In this case, almost 30 percent of the teachers had taught school between 11 and 20 years.

Sample Descriptive			N = 165	
Question	**State**	**Frequency**	**Percent**	
What state do you live in?	Alabama	1	0.7	
	Alaska	1	0.7	
	California	6	4	
	Colorado	2	1.3	
	District of Columbia	1	0.7	
	Iowa	30	20	
	Massachusetts	17	11.3	
	Michigan	3	2	
	Mississippi	3	2	
	Nebraska	1	0.7	
	New York	4	2.7	
	North Carolina	1	0.7	
	Ohio	4	2.7	
	Oklahoma	2	1.3	
	Oregon	1	0.7	
	Pennsylvania	3	2	
	South Carolina	1	0.7	
	Tennessee	1	0.7	
	Texas	64	42.7	
	Utah	1	0.7	
	Washington	2	1.7	
	Wisconsin	1	0.7	
Region of the country	North East	26	17.3	
	North Central	41	27.3	
	South	70	46.7	
	West	13	8.7	
Question	**Type**	**Frequency**	**Percent**	
What type of school do you teach at?	Type	Frequency	Percent	
	Charter	9	5.5	
	Private	25	15.2	
	Public	128	77.6	
	Other	3	1.8	
Question	**Min**	**Max**	**Mean**	**SD**
How long have you been teaching? — Years	1	42	15.2	10.4
Question	**Years**	**Frequency**	**Percent**	
Years of Teaching Experience	1-5	34	21.1	
	6-10	34	21.1	
	11-20	46	28.6	
	21-30	30	18.6	
	31+	17	10.6	

The second set of questions are related to the impact of Covid-19 on student outcomes and internet issues associated with online instructions. The first item asked teachers if they felt their students were doing better or worse now that classes are online? More than two-thirds (about 70 percent) felt their students was doing somewhat worse or much worse in their classes now that they were being taught online. Roughly 20 percent of the teachers indicated that their students were performing about the same. The next item asked teachers if they had access to internet at home, Most of the teachers (approximately 93 percent) indicated that they do have internet at home. When asked what percent of students at their school had internet at home, the majority of the teachers (54.7 percent) indicated between 0 to 20 percent. About one-fourth (25 percent) of the teachers indicated that between 21 to 50 percent of their students had internet at home. It should be noted that only about 10 percent of teachers thought that between 76 to 100 percent of their students had internet at home.

Associated with the previous question; teachers were asked if they or their students were having internet connectivity issues. About 50 percent of the teachers indicated that connectivity issues do occur sometimes. About one-third of the teachers reported connectivity issues occurred either half of the time or most of the times. Next, teachers were asked if students were offered an alternative if stable internet access was not available? About 70 percent of the teachers said "Yes" and the remaining 30 percent said "No".

The next set of items are related to curriculum issues associated with Covid-19. The first item asked teachers if they had changed their curriculum due to classes being online. About 60 percent of the teachers indicated they had and the remaining 40 percent said they had not. When asked if they were holding their class live, about 60 percent said "yes"; the remaining 40 percent said they did not hold live classes. Teachers were then asked if they had lost contact with any of their students; 72 percent said they had. Next teachers were asked if their students were able to follow along while at home, the majority (41.8 percent) said they might or might not. Approximately 30 percent of the teachers indicated that students were either "probably not" or "definitely not" following them at home. The final item related to curriculum issues asked if teachers felt that their students have problems engaging with class materials because of internet connectivity issues. Nearly 57 percent of the teachers indicated they believed their students were having problems engaging with class materials.

The final set of questions were associated with students' access to internet services and laptops through the school they attend. The first question asked teachers if they believe it is an equal rights issue that schools should be required to provide internet services to all students. Only about one-fourth (24 percent) believed that student access to internet services is an equal rights issue. The remaining 76 percent indicated that student access to internet services was not an equal rights issue. Teachers were then asked if they believed public internet access will improve student participation; almost 70 percent said "yes". When asked should schools provide internet access to students, around 42 percent said "yes" if students cannot afford it. Thirty seven percent of the teachers indicated that all students should be provided internet through the school. The final question asked if schools should provide laptops to students; 60 percent said that schools should provide laptops to all students. Thirty percent of the teachers indicated that schools should provide laptops if students cannot afford them.

Table 2 reports descriptive outcomes across regions of the country. When asked if students were doing better or worse, teachers from North Central and Western stated students tend to be doing either somewhat worse or much worse compared to other states. Teachers from North-East and Southern states tend to indicate more students were performing about the same. When comparing internet access, three of the four regions

reported more than 90 percent have access to internet at home. The only region that reported less than 90 percent were teachers in North Central states. When asked what percentage of students in their schools did not have internet at home, teachers from North-East had the highest percentages. In this case, teachers from North-East schools estimate that about 80 percent of their students have 0 to 20 percent access to internet services at home. Teachers in North Central states report their students have the most access to internet. About one-fourth of their students (50 percent or greater) have access to internet at home. When asked about internet connectivity issues; teacher in the North East reported the fewest concerns. In this case, about one-fourth of the teachers from North East states reported not having any connectivity issues. Over 20 percent of the teachers in Southern, North Central, and Western states reported having connectivity issues either most of the time or always. When asked if students have been offered alternatives in cases when stable internet access was not available, teachers from Southern and North-Central states were more likely to say yes. About 76 percent of Southern teachers and 85 percent of North-Central teachers reported they do provide alternatives to internet. Only about 46 percent of North-East teachers reported providing alternatives to internet.

Student Outcomes and Internet Issues			
Question	Impact	Frequency	Percent
Are your students doing better or worse now that class is online?	Much Better	3	1.8
	Someone Better	10	6.1
	About the Same	36	21.8
	Somewhat Worse	77	46.7
	Much Worse	39	23.6
Do you have access to the internet at your home?	Yes	152	92.7
	Yes, but Unstable	11	6.7
	No	1	0.6
What percentage of students in your school do you estimate do not have a stable or any internet connection at home? - %	0- 20 percent	88	54.7
	21-50 percent	40	24.8
	51-75 percent	16	9.9
	76-100 percent	17	10.6
Does dealing with internet connectivity issues, on either the teacher's or student's end, cause significant problems for the entire class?	Never	19	11.5
	Sometimes	83	50.3
	Half of the times	24	14.5
	Most of the times	28	17
	Always	11	6.7
Have you or your students been offered alternatives if stable internet acces was not available?	Yes	115	70.6
	No	48	29.4

When examining curriculum issues, the first item asked teachers if they had to change their curriculum due to internet access? Teachers in the South had the highest percent (64.3 percent) of teachers that indicated they did change their curriculum. Teachers in the Western states indicated the smallest percent (46.2 percent) of those teachers indicated they did change

their curriculum due to internet access. When asked if they were holding class sessions live, teachers located in North-East schools reported the highest percent at about 82 percent. North-Central and Southern teachers reported the lowest percent at 51.2 and 54.3 percent respectively. The next item asked if teachers felt they had lost contact with any of their students, teachers from the North Central reported the highest percentage with about 93 percent saying "yes".

About 85 percent of the teachers from Western states also reported they had lost contact with some of their students. The lowest percent was teachers from North-East states with about 31 percent. The next item asked teachers whether they felt their students were following along while at home. Teachers from North East indicated the highest percentage in agreement. In this case about 65 percent of the North East teachers either said "probably yes" or "definitely yes" to their students being able to follow along while at home. About 30 percent of the teachers from Southern, North Central, and Western states indicated that their students were either probably not or definitely not following along while at home. The final question related to curriculum issues; teachers were asked if their students were having problems engaging with class materials because of internet connectivity issues, over 50 percent of the teachers from Southern, North Central and Western states said "yes". The lowest percentage were teachers from North East with only about 39 percent saying "yes".

The final set of questions were associated with access to internet services. The first question asked if teachers felt equal rights are being violated if schools do not provide internet access to students. Approximately 30 percent of the teachers from Southern and Western states agreed it was an equal rights issue. About 85 percent of North East states teachers said no it was not equal rights. The next question asked teachers if they believed public internet access will improve student participation. Over two-thirds of the teacher from North East, Southern, and North Central states said "yes" to this statement. Nearly 62 percent of the Western state teachers agreed with this statement. When asked if schools should provide internet access to students, Western states teachers had the highest percent (46.2 percent) that indicated that internet access should be provided to all students. Teachers from North East states had the lowest percent (26.9 percent) of those teachers indicated that schools should provide internet to all students. Furthermore, 50 percent of the teachers from North East states indicated that the school should provide students internet if they cannot afford it. About 20 percent of teachers across North East, Southern, and North Central indicated No, schools should not be responsible for providing internet to their students. When asked if schools should provide their students with laptops, North Central teachers had the highest percent (73.2 percent) that said "yes", to all students. Teachers from North East states had the lowest percentage of teachers that agreed that school should provide laptops to all students.

However, North East teachers had the highest percentage of teachers that suggested schools should provide their students with laptops if they can't afford them. It should be pointed out; slightly over 20 percent of the teachers from Western states said "no", school should not provide laptops to their students.

Table 3 looks at descriptive outcomes associated with student outcomes and internet issues, curriculum issues and access to internet services across teachers' years of teaching experience. Under student outcomes the first question asks if teachers believed their students were doing better or worse now that classes were online. Over 75 percent of the teachers with 6 to 10 years of teaching service believed their students were performing either somewhat worse or much worse academically since classes have been moved to online. Over 60 percent of the other teachers with 0 to 5, 11 to 20, 21 to 30 years of teaching experience, and teachers with 31 plus years believed that their students were doing somewhat worse or much worse since their students have moved to online classes. Finally, about one third of the teachers with 11 to 20 teaching experience believed that students were doing about the same since moving to an online platform. When asked if teachers had access to internet at home over 90 percent of all the teachers across all teaching experience levels said they did. When ask to estimate what percent of their students do not have stable internet of no internet at all, 0 to 20 percent received the highest percent. This was true across all levels of teaching experience categories. The percent of teachers indicating 0 to 20 of their students do not have stable internet of no internet at all range from 66.7 percent for teachers with 0 to 5 teaching experience to 40 percent for teachers with 31 plus years of experience. It should also be noted that one third of the teachers with 31 plus years of teaching experience indicated that between 76 to 100 percent or their students do not have stable internet of no internet at all. When ask if connectivity Issues causes significant problems for either teachers or students, majority of the teachers across all teaching experience levels indicated sometimes. Slightly more than 25 percent of the teachers with 31 plus years of experience indicated connectivity Issues causes significant problems either most of the times or always. When asked if an alternative to internet was being offered teachers with 11 to 20 and 21 to 30 reported the highest percent of 84.4 and 78.8 percent respectively. The lowest percent were for the groups 0 to 5 and 31 plus years of experience with 47.1 and 53.3 respectively.

Curriculum Issues			
Question	Impact	Frequency	Percent
Have you changed your curriculum due to internet access issues?	Yes	96	58.2
	No	69	41.8
Are you holding class sessions live (i.e. not recorded)?	Yes	98	59.4
	No	67	40.6
Have you lost contact with any of your students because of school closures?	Yes	118	72
	No	46	28
Do you feel like your students are following along while at home?	Definitely Not	20	2.1
	Probably Not	31	18.8
	Might or Might Not	69	41.8
	Probably Yes	35	21.2
	Definitely Yes	10	6.1
Do students have problems engaging with class materials (class meetings, materials, etc.) because of internet connectivity issues?	Yes	94	57
	No	71	43

The next group of items addresses curriculum issues associated with the move to online classes. The first question in this section asked if teachers had changed their curriculum due to internet access issues. About two-thirds of the teachers in the 0 to 5 and 11-20 years of experience indicated they had. The lowest groups were teachers with 21 to 30 and 31+ years of teaching experience with percentages of 48.5 and 33.3 respectively. When asked if teachers were holding classes live, the largest group were teachers with 31+ years of experience, with 80 percent. The next highest percentage were teachers with 0 to 5 teaching years with about 62 percent saying "yes". The lowest group of teachers were those with 6 to 10, 11 to 20 and 21 to 30 teaching years, with percentages of 55.9, 57.8 and 51.5 respectively. When asked if teachers had lost contact with students because of school closures, teachers with 6 to 10 teaching years indicated the highest percentage at about 85 percent. The lowest percentage were teachers with 31+ years of teaching experience, with about 47 percent saying "yes". Teachers from 0 to 5 years and 11 to 20 years, indicated about 73 percent have lost contact with some of their students.

The next item asked was whether teachers felt their students were able to follow along while at home. Almost 45 percent of the teachers with 0 to 5 years of teaching experience indicated that their students were either "probably not" or "definitely not" able to follow along. It should be pointed out; roughly 40 percent of the teachers in the 21 to 30 and 31+ years indicated their students were either "probably yes" or "definitely yes" able to follow along at home. The next item asked whether teachers felt their students were having problems engaging with class materials because of internet issues. Teachers in the 31 + teaching year group had the lowest percent (46.7 percent) that responded "yes" to students having problems engaging with class materials. The group with the highest percent (65 percent) stating "yes", their students were having problems engaging with class materials were teachers with 6 to 10 years of teaching

experience. Approximately 60 percent of the teachers in the 0 to 5 and 21 to 30 teaching experience groups responded "yes" to this question.

The last section of this table looks at teachers' perception to student access to internet services. The first question asks teachers if they fill it an equal rights issue associated with student access to internet services. The highest percent of teachers that agreed with this statement were teacher with 0 to 5 years of experience. In this case about 32 percent of this group said "yes". The next highest group of teachers that agreed with the statement was 31 plus teaching experience. About 29 percent said "yes" that this was an equal rights issue.

The group with the lowest percent was teachers in the 11 to 20 group. Seventeen percent of these teachers said "yes". The next item asks if teachers believe that public internet access will improve student participation. Three groups, 6 to 10, 11 to 20 and 31 plus responded "yes" at a rate of 70 percent or above. About two-thirds of the remaining group, 0 to 5 and 21 to 30 answered "yes" to this item. When asked if teachers believed that schools should provide internet access to students, the highest percent of teachers that said "yes" to all students were teachers in the 31 plus years of experience group. About 43 percent of these teachers agreed with this statement. The remaining four teaching experience groups agreed that schools should provide internet access to all students range from about 39 percent for the group 0 to 5, to 33.3 percent for the group 21 to 30. A large percent of the groups suggested that schools should provide internet access to student if they cannot afford it. The percentages range from a high of 50 percent for the 21 to 30 group, to about 36 percent for teachers in the 31 plus years of experience. Slightly more than 21 percent of 0 to 5, 6 to 10, 11-20 and 31 plus groups said "no" schools should not provide internet access to students.

The final question associated with access to internet services was should schools provide laptops or tables to students. Sixty nine percent of the teachers in the 6 to 10 group said "yes" schools should provide laptop/tables to all students. About 64 percent of the teachers in the 0 to 5 and 21 to 30 groups of teachers said "yes" schools should provide laptop/tables to all students. The lowest percent of teachers that agreed that schools should provide laptop/tables to all students were the group 31 plus. About 29 percent of the 31 plus group of teachers said "yes". It should be noted that the 31 plus group of teachers had the highest percent (42.9 percent) of teachers saying "yes", schools should provide laptop/tables to all students if they cannot afford to. Furthermore, 31 plus group of teachers had the highest percent (28.5 percent) of teachers saying "no," schools should not provide laptop/tables to all students.

Discussion

The impact of COVID 19 has had a devastating effect on an already struggling educational system in the United States. This is especially true since over the years, one of the major divisions in succeeding or failing in

school has been centered on the technology divide. In this case successful schools are more likely to have more technical access, such as internet and computers in the classrooms, compared to failing schools that have limited access to technology. Students attending these successful schools are more likely to have computers and internet access at home compared to students attending these failing schools. Therefore, with the closing of schools due to COVID 19, the educational system, K-12, Colleges, and Universities are now forced to rely on technology and the internet to continue to educate their communities. This could lead to further educational divide influenced by the technology divide.

The purpose of this study was to examine the impact of school closing due to COVID 19 on the classroom teachers through the eyes of technology issues across the country. The first important finding in the study is related to the overall descriptive outcomes. In general, a large percent of students across the country do not have stable or any internet services in their home. Furthermore, even for those that have internet, connectivity issues caused problems for the entire class. Majority of the teachers indicated students were doing worse academically due to being relegated to learning in an online environment. However, most teachers are offering an alternative to internet instructions when internet access is not available. Finally, teachers overall believe their students are doing worse academically due to the online platform.

When asked about curriculum changes only a small majority indicated they have changed their curriculum to fit the online environment. Overall, a small majority are holding class live online now; however, a large percent of the teachers reported that they had lost contact with some of their students due to the online nature of classes. Teachers proceeded to say that students may or maybe not be able to follow along with them at home. Additionally, a small majority of teachers suggest students had problems engaging with class materials due to internet connections.

Most teachers did not believe internet access is an equal rights issue. However, the majority of teachers did believe that schools should provide lab top/tables to all students. When asked "should schools provide internet access to students?" Many of the teachers indicated "yes", if students cannot afford it. Finally, teachers do believe that public internet will improve student participation.

The second important finding in this study is related to the comparison of responses between the teachers across regions of the country. When asked if their students are doing better or worse due to online classes, teachers from North Central and Western states advised that their students were struggling more compared to other regions of the country. Teachers in North East states tended to have less internet connectivity issues compared to other regions, and North Central and Western regions tended to have the most problems. North East states had more live class sessions and less contact lost with their students compared to other regions. With more online classes, North East teachers report

fewer students were having problems engaging with class materials due to internet issues. Finally, North East teachers stated that their students were more likely to be able to follow along while at home compared to other regions.

North Central teachers had the lowest percent when asked if they were holding class sessions live. This may explain why they are reporting the largest percent of teachers that have lost contact with some of their students. Likewise, this might explain why these teachers are having the most problems with students following along with instructions at home.

Similar to North Central states, Western and Southern states have a small majority of teachers that were teaching classes live. This is also associated with a large percentage of teachers reporting they have lost contact with some of their students. These teachers are also indicating a significant percent of their students are having problems following along with instructions at home.

The third important finding in this study was associated with years of teaching experience. New teachers in their first five years are less likely to offer alternatives when internet was not available compared to other teaching experience groups. Furthermore, new teachers were more likely changed their curriculum due to internet access issues compared to other teaching experience groups. Finally, a higher percent of new teachers believed the internet access is an equal rights issue compared to other teaching experience groups.

Teachers with 31 plus years were less likely to change their curriculum, more likely to hold class live sessions and less likely to lose contact with their students. Furthermore, for this teaching group their students are less likely to have problems engaging with class materials because of internet connectivity issues, compared to other teaching groups. Finally, this teaching group were more likely to agree that schools provide internet access to all students and less likely to agree to schools provide laptops to all students.

Conclusion

As we rely on technology more in the classroom, teacher education program will have to infuse proper training on effective use of this instructional modality. The internet can enhance the classroom learning environment by providing instant access to material like never before. Hopefully this study has highlighted some of the current success and problems association with the internet and online instructions. Furthermore, we hope this study will lead to scientific studies and large scales studies that can identify remedies to the issues that this study has identified.

References

Auxier, B., & Anderson, M. (2020). As schools close due to the coronavirus, some U.S. students face a digital 'homework gap'. Retrieved from https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-homework-gap/

Carlsson, M., Dahl, G. B., Öckert, B., & Rooth, D. (2015). The effect of schooling on cognitive skills. The Review of Economics and Statistics, 97(3), 533-547. doi:10.1162/REST_a_00501

Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review: Review of Educational Research, 66(3), 227-268. doi:10.3102/00346543066003227

Education Week. (2020, May 15,). Map: Coronavirus and school closures. Education Week, Retrieved from https://www.edweek.org/ew/section/multimedia/map-coronavirus-and-school-closures.html

FCC. (2020). Home network tips for the coronavirus pandemic. Retrieved from https://www.fcc.gov/home-network-tips-coronavirus-pandemic

Fan, Weimiao, and Zheng Yan. "Factors Affecting Response Rates of the Web Survey: A Systematic Review." Computers in Human Behavior, vol. 26, no. 2, 2010, pp. 132–139., doi:10.1016/j.chb.2009.10.015.

Handcock, Mark S., and Krista J. Gile. "Comment: On the Concept of Snowball Sampling." Sociological Methodology, vol. 41, no. 1, 2011, pp. 367–371., doi:10.1111/j.1467-9531.2011.01243.x.

Johnston, K., & Vázquez Toness, B. (2020). Boston gears up for school shutdown. Retrieved from https://www.bostonglobe.com/2020/03/15/nation/bps-providing-students-with-chromebooks-while-schools-are-closed-due-coronavirus/

Mineo, L. (2020). The pandemic's impact on education. Retrieved from https://news.harvard.edu/gazette/story/2020/04/the-pandemics-impact-on-education/

NCES. (2019). Digest of education statistics, 2019. Retrieved from https://nces.ed.gov/programs/digest/d19/tables/dt19_702.12.asp

NCES. (2020). The condition of education - preprimary, elementary, and secondary education - family characteristics - children's internet access at home - indicator may (2020). Retrieved from https://nces.ed.gov/programs/coe/indicator_cch.asp

Office of the Texas Governor. (2020). Governor Abbott, TEA, Dallas ISD

Launch Operation Connectivity Statewide. Retrieved from https://gov.texas.gov/news/post/governor-abbott-tea-dallas-isd-launch-operation-connectivity-statewide

Supreme Court of the United States, & Warren, E. (1953). U.S. reports: Brown v. board of education, 347 U.S. 483 (1954). Retrieved from https://www.loc.gov/item/usrep347483/

UNESCO. (2020a). Adverse consequences of school closures. Retrieved from https://en.unesco.org/covid19/educationresponse/consequences

UNESCO. (2020b). COVID-19 Impact on Education. Retrieved from https://en.unesco.org/covid19/educationresponse