The Survey on Online Learning for Secondary School Students During the COVID-19 Pandemic

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Abstract
COVID-19 has forced nearly all students including K-12 into online education during pandemic time. This study explores how students at the secondary school reacted to the full-time online learning during the COVID-19 pandemic. A survey has been carried out in Fort Bend and nearby counties, Texas to compare students' online learning conditions, experiences, and expectations. Some implications were made to advise the related policy makers and schools on improving for the future online learning into the secondary school students.

Keywords: Online Learning, Secondary School, COVID-19 Pandemic

Introduction

Online instructional education has grown rapidly in the past decade with the advantages to learn anytime and anywhere (Norman, 2016). However, there has been a long-time debate on whether online learning is a good format for K-12 students (Zheng, Lin, and Kwon 2020). Because of COVID-19 Pandemic, online learning was adopted by all stages of education to provide students with continuous education (Hong, et. al. 2021). This survey study explores how students in secondary school reacted to the mandatory full-time online learning during the COVID-19 pandemic in Fort Bend and nearby counties, Texas.

Literature Review

Online learning has the benefit of various forms of multimedia such as texts, audios, and videos (Clark 2015), more flexible self-responsible learning pace, and lower costs (Sun and Chen, 2016). Of all students enrolled in higher education before 2020, 33.5% enrolled in some form of distance education/online learning courses (Education Data, 2021).

In US, K-12 schools' curriculum entirely online are usually Charter schools offering alternative formats for students (Anthony, 2019; Barbour, 2019), and before COVID-19 the online education in the US was mainly asynchronous in nature or hybrid, with a combination of online and face to face format (Molnar et al., 2021). Fully online or synchronous education for K-12 students is low participation in Charter schools and advanced courses offered in public schools (Arnesen et al, 2019). However, enrollment in US online schools is growing, 30.6% of Charter schools offers an entire course online, versus 28.5% of traditional public schools (NCES data, 2021).

Compared to online learning, numerous studies (Major, 2014) show that traditional face to face learning provides real and meaningful interactions among students and teachers. There are concerns and complaints on online instruction including: poor course content, little collaborative learning, inconsistent instruction, no access to teachers, poor instructor preparation, and technical or network problems (Kumari, Hemalatha, and Ali 2020; Raheim, 2020).

Starting from March 2020, almost all students in the United States are forced to transit from face-to-face classes to online learning because of the coronavirus disease (COVID-19) pandemic. However, some challenges are faced by the students. Hong et al. (2021) and Salzano et al. (2021) stated that online learning is ineffective because of unsuitable internet facilities, teachers' inability to implement online learning, and the lack of cooperation given by parents. Basar et al. (2021) found that online learning outcomes cannot be met since of high cost to purchase suitable tools. Studies by Muhammad and Kainat (2020) and De Leon (2022) found that internet access problems, a lack of interaction between teachers and students, and a lack of technological facilities have the important effect on the efficacy of online learning.

In this paper, we conducted a survey focused on secondary school students to explore their reaction to full-time online learning during this pandemic time.

Survey Design

The demand for online learning has kept on rising because of its flexible forms, lower costs, easily accessibility, and self-adjustable pace (Sun and Chen, 2016). While online learning can be a highly effective education method, it is less effective or efficient for secondary school students (Jung and Lee, 2018).

In (Agung et. al 2020, Yan et. al. 2021), some issues are identified for online learning during Pandemic COVID-19, including internet connection, IT equipment, limited collaborative learning opportunities, reduced learning motivation and increased learning burdens. Most of the papers are focused on higher education, we hope to conduct a survey mainly focusing on the secondary school students to find out their reactions to full-time online learning. The survey results may help educational authorities and institutions to better understand students' difficulties and potentially improve their online learning in the future.

The survey is carried out and most of feedback is collected in Fort Bend ISD, a school district system in Texas based in the city of Sugar Land. The district received an accountability rating of B for 2021-2022 school year, and the district ethnic distribution is 27.5% African American, 27.3% Asian, 26.4% Hispanic, 14.8% White and 4% Others. Like most schools in US, Fort Bend has implemented the online learning program starting from Mar. 2020, then started to offer both face-to-face and online instructional delivery to the students from Oct 2020, and finally discontinued the online program in Dec 2021. Students should have between 7 months to 18 months experience of mandatory online learning depending on the learning method they select.

The survey and this study aimed to examine online learning for feedback from the secondary school students and provide some potential actions to improve the future online education. Formally, there are three research questions for students during online learning compared to face-to-face education:

1. What learning conditions were experienced by students?
2. What benefits and obstacles were received by the students?
3. What expectations do students have for future online learning education?

Survey Results

The survey was conducted from September 2022 to December 2022, targeting at the secondary school students, grade 9 to grade 12. A total of 180 students completed the survey, the number of students and percentage in different school grades are shown in Figure 1.

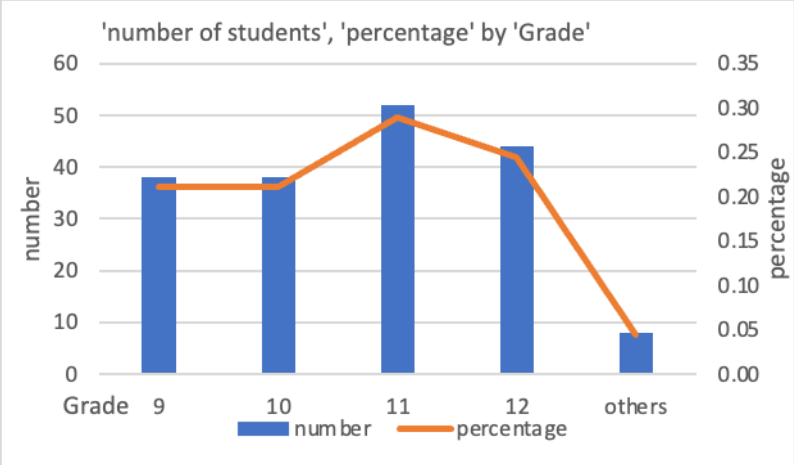

Figure 1: The number of students in each grade

Among them, about 74 are female (41.1%), 102 are male (56.7%), and 4 (2.2%) declined to answer this question.

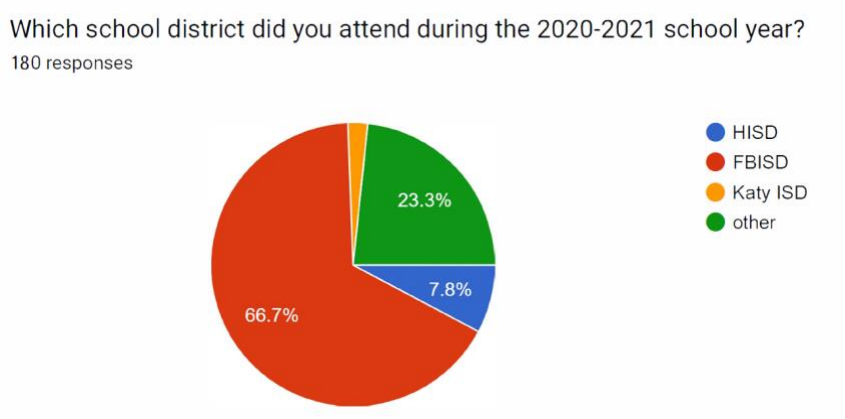

Figure 2: The percentage of students in school district

Also, we asked which school district did the student attend during the academic year 2020-2021? The response is in Figure 2, 66.7% students are in Fort Bend ISD, 7.8% from Houston ISD, 2.2% from Katy ISD, and the rest is from other ISD.

Learning Methodology and Tools

In this subsection, we first show the survey results from the teachers' teaching methods, teachers' teaching tools, and students' learning platform. The responder could select one or more answers from each question.

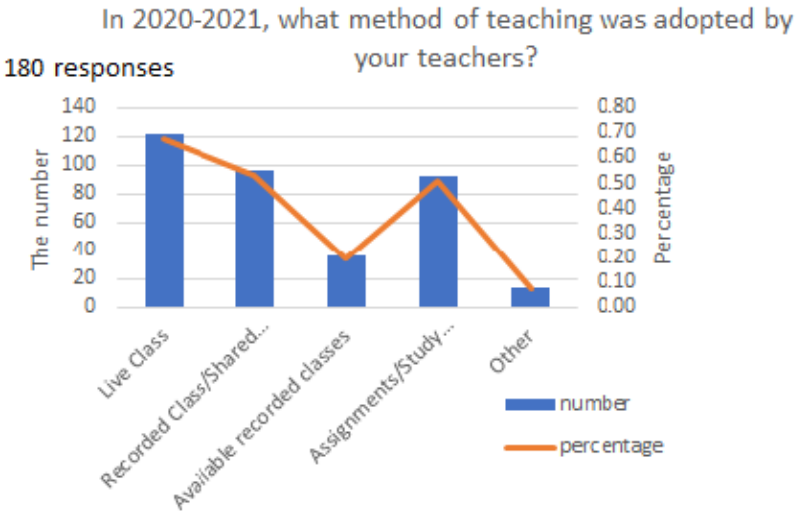

Figure 3: The teaching method

In the digital age, the use of information and communications technology during online learning allows students to learn and apply the skills that they need (Ratheeswari, 2018). In Figure 3, when moving classes from face-to-face to online, around 68% teachers selected live/synchronous classes, which provided students in a similar way to face-to-face learning. Also, synchronous classes would enhance direct interaction for online learning, "students don't get to see the professor or classmates face to face" gives negative experiences for online students (Johnson, 2022). In addition, more than half of the teachers also used recorded class/shared video and asynchronous assignments/study materials as well.

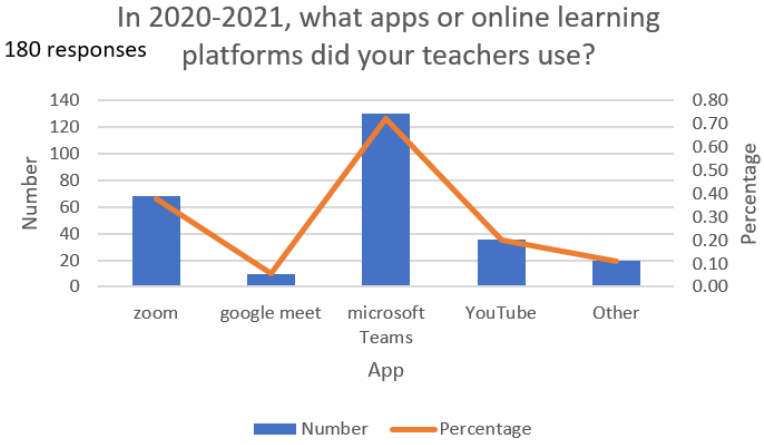

Figure 4: The teaching platform

In Figure 4, it showed that about 72% of teachers use Microsoft Teams and 38% use zoom, mostly teachers use Microsoft Teams for synchronized class, but using Zoom for office hours or teacher-parent conference, administrated by the ISD IT department. YouTube is also used for teaching, evidence showed that the young generation possess the greatest interests in games and videos for their online education (Basar, 2021).

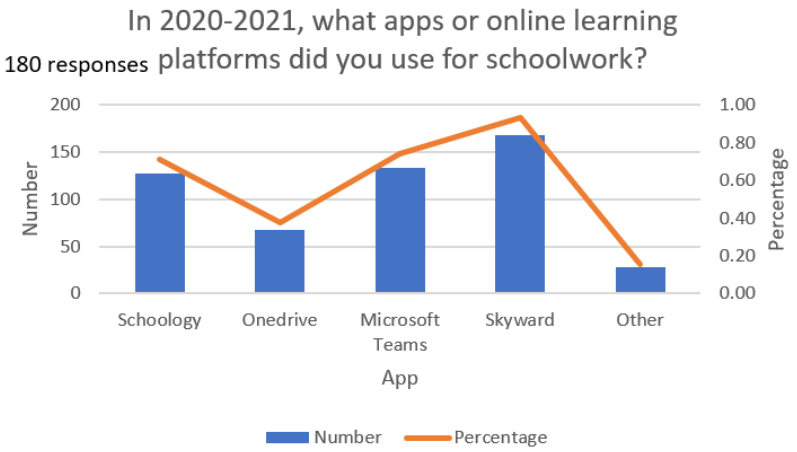

Figure 5: The learning platform

Finally in Figure 5, the applications that students used for online learning are surveyed: Schoology is used for instructional delivery, communication, and progress monitoring; Onedrive is used for cloud document access; skyward is used for class scheduling, gradebook, and the attendance record; and Microsoft Teams is used for synchronous classes.

Learning Environment

According to Wildana et al. (2020), the availability of the internet, the cost of machine or network, and the new modern technologies are the top reasons to affect the mass-adoption of online learning. In the 180 responses of our survey, 81.1% of respondents said they use devices they have already owned, 6.7% purchased new devices, and 12.2% borrowed devices from school.

In figure 6, the top three factors are network connectivity, hardware devices, and electricity. Also, around 31% have no problem during their learning.

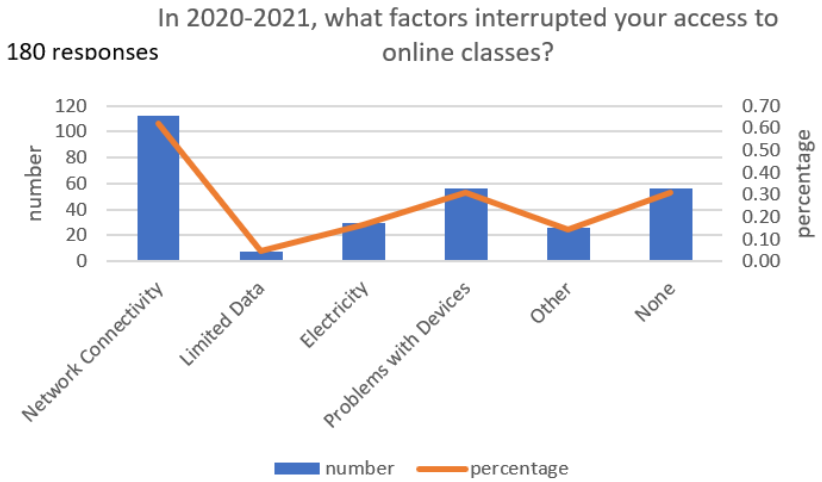

Figure 6: The factors interrupted online classes.

Parental engagement has been shown to be correlated with student performance in traditional face-to-face courses. As a result, parental help has the potential to increase student performance in online courses. However, since our responders are mainly secondary school

students, age 14 to 18, 43.3% of respondents said that parents have only a little involvement in online learning, then 26.7%, 14.4%, 13.3%, and 2.2% increasing to heavy involvement.

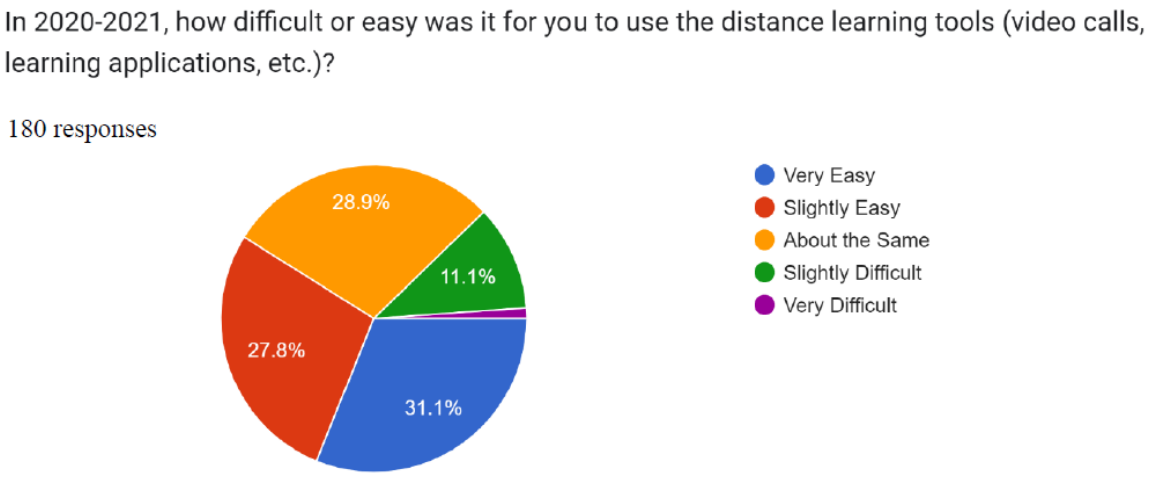

Figure 7: The learning tool difficulty

During pandemic, when school moved the students' learning from face-to-face to online environment, in our survey results in Figure 7, only 1.1% thought it is very difficult for the new modern technologies, and only 11.1% thought it is a slightly difficulty, 28.9% thought it is the same as face-to-face environment. 27.8% and 31.1% thought it is slightly easy and very easy. So at least in our survey, new technologies and tools are not a factor to affect online learning for high-school students.

Learning Benefits and Obstacles

Even though online learning is the only suitable method of learning in pandemic, we wonder that compared to conventional classroom learning, what percentage of students felt they benefitted from online learning environment, and what they really enjoy or dislike. In 2020-2021 online learning, the questions we asked are following:

1. Do you think it was easier to obtain teaching materials delivered by the teacher?
2. Do you spend more time and effort learning online when compared to face-to-face classes?
3. Do you think the material presented by the teacher in class is easier when studying online compared to face-to-face classes?
4. Could you communicate smoothly with the teacher/lecturer during online learning when compared to face-to-face classes?
5. Were you more eager to participate in class compared to face-to-face classes?
6. Did you always get a quick response from the teacher when compared to face-to-face classes?
7. Did you feel that you had the necessary support and resources needed to study effectively from home?
8. Did you have a better bond with your friends and classmates online compared to face-to-face learning?
9. Did you feel more comfortable taking online exams or tests compared to face to face?
10. Compared to face-to-face, the workload was heavier throughout the school year?

QUESTIONS	STROGNLY AGREE	AGREE	ABOUT THE SAME	DISAGREE	STRONGLY DISAGREE
Q1	11.1%	24.4%	28.9%	27.8%	7.8%
Q2	6.7%	17.8%	24.4%	36.7%	14.4%
Q3	6.7%	12.2%	23.3%	38.9%	18.9%
Q4	2.2%	5.6%	21.3%	51.7%	19.1%
Q5	1.1%	6.7%	18%	41.6%	32.6%
Q6	1.1%	6.8%	46.6%	34.1%	11.4%
Q7	5.7%	31.8%	36.4%	19.3%	6.8%
Q8	1.1%	4.5%	5.7%	36.4%	52.3%
Q9	13.6%	22.7%	45.5%	15.9%	2.3%
Q10	2.3%	3.4%	46.6%	40.9%	6.8%

Table 1: Survey Results for Online vs. Face-to-Face

All survey results are given in Table 1. In Q1, almost the same percentage 35.6% students thought it is harder vs. 35.5% thought it is easier to get the online teaching materials. From Q2, 75.5% of students didn't think they spent more time learning on-line. Also 73.9% thought that they have enough support or resources to study for online environment (Q7). In addition, more students 36.3% of students like online exams compared to 18.2% who dislikes in Q9. Finally, in Q10, only 5.7% thought the workload in online learning was heavier than face-to-face learning.

However, around 57.8% of students thought online learning was harder in Q3, also, around 70.8% of students thought it was harder to communicate with teacher (Q4), and 45.5% of students didn't get a quick response from the teachers (Q6). In addition, 88.7% missed face-to-face classmate interaction or bonding in Q8, and 74.2% of students preferred face-to-face mode in learning in Q5.

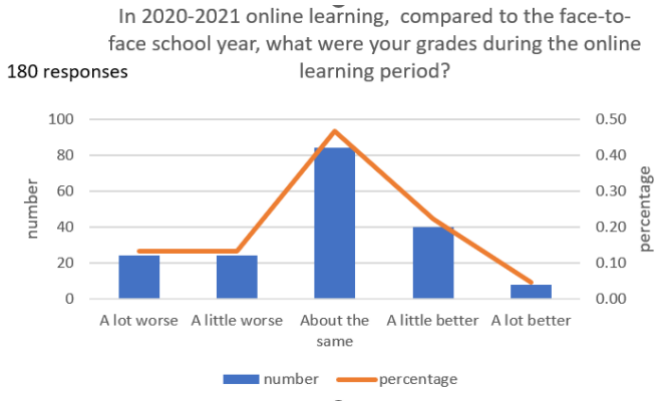

Figure 8: The grade for online vs. face-to-face

We also asked what students' grades for online learning were compared to face-to-face classes in Figure 8, about 26% students thought it is worse than face-to-face, at the same time, 26% students thought it is better than face-to-face, the remaining 48% thought it is the same.

At last, we have two open questions without answer:

1. Which course or subject did you think was the most difficult to learn in an online environment in 2020-2021?
2. In 2020-2021, what did you miss the most about physically attending classes?

The top 3 answers for Q1 are Math (38), Science (34), and English or ELA (28). It is harder to learn Math and ELA online since it can be hard to learn complex topics without a teacher to explain things directly and hear questions other students ask. Science is selected since it is an experimental class by operating hands-on labs, which turns out very hard to do labs online. For Q2, almost 95% of 176 responses mentioned friends/classmates/teacher/peers, which has been identified as the biggest challenge for online education (Johnson, 2022). Also, there are a few answers such as school, classroom, organization, etc. Increased isolation impacted the mental health of children as it did adults, experts said. Negative emotions such as frustration, anxiety, depression, and boredom are companied with the students (Naff, 2022, Browne, et. al, 2021). In early 2021, emergency department visits for suspected suicide attempts were 51% higher for adolescent girls nationwide compared to the same period in early 2019, according to (Yard et al., 2021).

Suggestions for Future Online Learning

In conclusion, when we talk about the online learning benefits and obstacles, most students recognized that online learning is more convenient, learning anytime and anywhere, most of them do not have difficulty in using tool, finding materials, and taking exam. However, the main obstacle in online learning is lacking communication with classmates and slow or absent responses from teachers (Yates et. al. 2020), also, most students thought online learning is harder. Thus, high-school students need further guidance to help them better direct their learning efforts.

As shown from the survey results, improving the delivery of online learning not only requires the efforts of students, but also depends on the actions of policy makers, teachers, and parents.

- Educational authorities and schools should always provide a thorough guide and technical support for students who have technical issues in online learning.
- Group learning and peer interaction are important for secondary school students. The delivery of online learning should be carefully designed to provide more communication with each other and engage in collaboration learning.
- Special options should be supplied to school students, providing them with paper-based materials such as exam papers, so they prefer to take paper-based examinations.
- Administrators and educational leaders should also provide licensed mental health professionals for the students to handle mental issues for long-time online learning.

The above findings are limited to the survey we have done for online learning during the COVID-19 pandemic. The population may not be representative as participants are all from a single city. Also, the quality of online learning platforms, teaching contents, and pedagogy could be unique or special from others.

Conclusions

Online instruction is increasing very fast recently, in 2020, COVID-19 has forced nearly all global students, including the secondary students to online instruction during pandemic time for more than one year. However, we must recognize that the objective of online learning during COVID-19 was not to reconstruct an environment that provided a stable or better education, but an environment that provided immediate virtual access to most students during the crisis.

In this paper, a survey has been carried out in Fort Bend and nearby counties, Texas to compare students' online learning conditions, experiences, and expectations with the traditional face-to-face learning. Some implications were made to advise the related policy makers and schools on improving for the future online learning for the secondary school students.

Finally, there are many negative impacts of online learning during pandemic time, especially mental health issues. Administrators and educational leaders need to make decisions about how to best offer support for online education in the future.

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