

The Year that Changed Teaching:

*The Effects of the COVID-19 Pandemic on Teaching Mathematics in the High School
Classroom*

An Honors Thesis (HONR 499)

by

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Abstract

The COVID-19 pandemic was an unprecedented time in our country, with many “normal” functions shutting down or changing completely. This included the field of education, with many schools switching from the standard in-person setting to an all-virtual setting nearly overnight. The challenges that many students have faced throughout this process have been talked about on many media outlets, but many of the challenges that teachers faced have not received the same light. Many teachers during this time quit or found other job opportunities, but those who stayed had to adapt to this new way of teaching. By surveying those teachers who stayed to identify the challenges that they were presented with, we can better understand how many teachers adapted to this new virtual learning environment and overcame many of the obstacles that were present in these grim times.

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Process Analysis Statement

The email that I received from Ball State University in March of 2020 signaled the first of many dramatic changes to my final year of college. Because of the COVID-19 pandemic, my junior year was cut short, and my senior year became a hybrid experience of online and in-person learning. Long-held expectations for my final year of college went out the window due to concerns of health and safety. Despite the best efforts of many, schooling as we knew it was forced to change before our eyes. While many college professors were used to online software, high school teachers often had less access to technology, software, and training than their collegiate counterparts. During my senior year of high school, only back in 2017, my teacher would walk around the room and check our homework manually, recording scores on pencil and paper. As most schools quickly adopted a virtual model of instruction, this would no longer be an option. Thinking about how I was going to student teach during the semester in which this thesis was to be completed, I became curious about the many ways that high school education had changed due to the pandemic.

I decided that because I am going to become a teacher of mathematics, I would reach out to other mathematics teachers to discover the challenges and changes to their classrooms made during the pandemic. The main goal at the start of this thesis was to give these teachers a voice in what happened to them at this pivotal time in our country and discover the many changes that they had to make to succeed at their jobs. While designing a survey to distribute to teachers, my advisor and I decided that doing two case studies of two different high schools would be the best course of action for this type of survey. By choosing two different high schools, I could analyze how two different school districts responded to the pandemic. The two high schools chosen were those that I had direct connections with: Centerville Senior High School in Centerville, Indiana,

where I graduated from, and Anderson High School in Anderson, Indiana, where I would complete my student teaching. In addition to having direct connections to these high schools, each had different settings, demographics, and student populations. This allowed for this survey to also take those factors into consideration when completing the thesis. Lastly, it was decided that I would not compare the two schools to each other, but rather tell the story of how each high school responded to the pandemic. It would be difficult to say if either high school responded correctly, so by avoiding this in my thesis and highlighting the facts, this thesis would find what did and did not work for each high school so that I may incorporate them into my own teaching in the future.

The questions were developed to hit a variety of topics that may have been affected by the pandemic. These topics included student participation and morale, assessments, cheating, technology, and an optional category that provided these teachers with the chance to say anything that they learned about themselves or their students. Obviously, since schooling had to change to continue during the pandemic, the questions were designed in a way to show the effectiveness of each school's changes.

By analyzing these changes and comparing them to what I have learned throughout my time at Ball State, I hoped to find some beneficial changes and incorporate these positive outcomes from the pandemic into my own classroom. My goal is to be constantly improving as an educator, so reflection and change are necessary. By learning the methods that worked during the pandemic, I will become a stronger teacher for my first teaching job.

Introduction

The COVID-19 pandemic stopped the world during March 2020. Many life functions that were deemed “normal” suddenly ceased to exist or existed in a much different form. All fields were impacted immensely, but perhaps the one that was now more alien than the rest was the field of education. No longer were students roaming the halls of their local high school, participating in extra-curricular activities, or going simply to an in-person class. These changes impacted their lives tremendously, and much talk has been given to what is next for our students. However, many teachers who had been teaching for countless years were now forced to change their style immensely. No more was direct face-to-face instruction allowed, nor was it even an option. With such a drastic change forced upon teachers so suddenly, many were left asking themselves: What do I do?

With that question above comes the topic of this paper. How did teachers respond to the COVID-19 pandemic and meet, challenge, and exceed expectations? This paper will do an in-depth analysis of two separate school corporations, asking mathematics teachers from each corporation how they changed instructions for the unprecedented virtual high school setting.

Setting the background

Centerville, Indiana is a small town nestled close to the Ohio border. According to the World Population Review, the population is 2,615. The town itself is home to many smaller businesses and branches of businesses from the larger nearby town of Richmond, Indiana. While there is not much to do within this town, one of the well-known parts of this town comes in the form of the high school. When visiting the local high school, one is greeted by the football field, tennis courts, and cornfields before walking into the school. According to the Indiana High

School Athletic Association, or IHSAA, the high school is home to 491 students, good enough to be the 216th largest high school in Indiana during the 2019-2020 school year. The high school is home to five different mathematics teachers, teaching a range of mathematics subjects beginning from algebra I and going up to Calculus I. Because of this, the students are introduced to a variety of mathematical subjects throughout their time in this school. During the COVID-19 pandemic, the smaller size of the school helped prevent the spread of the disease, but the main question about that arose for this school individually was how they could adapt to a virtual learning environment given their smaller size.

Anderson, Indiana was once a town known for industrial excellence, but in recent years has been struggling to maintain the once plentiful industrial companies that employed many of the town's citizens. Located about 45 minutes from Indianapolis, Anderson is a city with a population of 54,872. The city is large enough to be able to provide amenities such as a public transportation system, a municipal airport, and many different parks located throughout the city. Once home to three different high schools, consolidation has brought this number down to just one high school located in the southern part of the city, Anderson High School. Anderson High School boasted a student body consisting of 1,810 students during the 2019-2020 school year, making it the 44th largest high school in the state of Indiana. Many students unfortunately live in poverty, with services such as school lunches offered to each student for free. The COVID-19 pandemic forced this school to adapt differently than other schools, given such a high poverty rate. The sheer size of the school made it harder for students to return in person but allowed for more experimentation with each individual class.

The schools presented above in this case study are fundamentally different, as one is a small rural school while the other is a larger school in an urban setting. Unfortunately, the

COVID-19 disease did not pick favorites and targeted each school the same, but by surveying mathematics teachers from each school, insights were gained on how each school individually tackled teaching during the pandemic.

Methodology

To get a better feel of what was happening during this time, it was decided to record what was happening while we were still in the pandemic. As teachers were the ones who had to adapt to the pandemic, a survey was sent out to mathematics teachers at each of these high schools. Centerville Senior High School has five mathematics teachers, teaching subjects ranging from Algebra I to Calculus I. Anderson High School has fourteen mathematics teachers and offers a range of courses from Algebra I to Calculus II, with other types of advanced placement classes offered such as statistics and finite mathematics. Because Centerville Senior High School is in a rural setting and Anderson High School is in an urban setting, the choice to survey mathematics teachers from these two high schools allows for an in-depth analysis of how two different school systems that serve two different demographics handled the pandemic. In addition to this, Anderson High School has a student body that is roughly three times that of Centerville Senior High School, presenting a different challenge of how a large high school handles a disease that is transmitted through the air.

A survey was designed to allow mathematics teachers to give their input on how they adapted to the challenges that came about with the pandemic. The survey has questions covering adapting to teaching/learning in a virtual environment, the integration of technology, assessment, motivation, and positive changes that they found to work in the virtual environment. In addition to these questions, an optional question was added that allowed the selected mathematics

teachers the options to talk about personal growth or what they discovered about themselves during these challenging times. The survey was given to mathematics teachers from Centerville High School and Anderson High School nearly one year after the COVID-19 pandemic began. While the goal of this survey was to learn what happened at the end of the 2019-2020 school year, teachers were able to give their thoughts on changes made for the 2020-2021 school year as well. This gave teachers the freedom to say anything that they believed was important to understanding what happened during this year in the pandemic. Because of the nature of the pandemic, the survey was conducted qualitatively rather than quantitatively, allowing mathematics teachers to discuss their thoughts rather than attempt to boil each of their responses down to a single number. While this does produce results that are harder to generalize, the voices of the teachers who taught during this time cannot go unheard.

Student Response to Pandemic

When Centerville Senior High School went virtual, their response to the pandemic was to have students do most of their work asynchronously, with some optional Zoom classes for those who needed the extra help. Homework was assigned via Schoology for students to work on, though the workload for each student was decreased due to the pandemic. Students were also given links to interactive websites, assigned problems from books, and given certain PDF files to read. In order to be counted present for a class, students would either log into a google sheet and write their name or turn in their work for a given day.

The school day looked much different from before, but surprisingly, three of four mathematics teachers from Centerville stated that their students overall responded in a positive manner to the idea of virtual school. While most were open to the idea, the morale of the students

who were virtual was much lower than when they were in-person. According to one teacher, these students were unable to get the in-person help that they really needed. Because of this, participation in classes also dropped, as students were unable to feel confident in their answers when working on practice problems on their own. The physical connection of the in-person classroom was lacking, and it was evident in the work that the students were turning in. While many students like the idea of virtual learning, it can prove to be more challenging than they initially believe.

Anderson High School mathematics teachers responded in many similar ways, but within this school corporation lies many students who live in poverty. This presented an additional challenge in ensuring that all students would be able to have access to wireless internet to complete their work. Students would sign into class via a Google form for their attendance. After that, a video would be posted to the Canvas platform, along with the daily assignment. Some teachers opted to have assignments not due daily, but most teachers decided to make assignments due daily.

Because of these challenges elaborated above, all teachers from Anderson High School responded that they had a noticeable drop in the motivation, morale, and participation of their students. One teacher noted that each student is different, making this a broad question with no definitive answer, but many of their students saw a drop in their grades. Many teachers reported that students who were receiving high letter grades in their class began receiving lower scores, dropping their grade. One teacher stated that their students severely disliked completing quizzes on Canvas, much preferring doing mathematics with a pencil and paper. Because of these results, teachers from Anderson overall felt that the move to virtual learning had their students feeling lost and unsure of what to do. As one teacher put it, "It was near-complete devastation."

The switch to online school during March of 2020 put many students into a rough spot. While students complain about going to school, the standard school day provides structure to high school students and gives them the chance to get in-person help in real time. This overall benefits each student and puts them in a position to succeed. However, the pandemic's switch to online learning forced many students to adapt how they were learning, leading to a loss of morale and motivation to learn. Students from both schools experienced these feelings, leading to lowered participation and lower grades in each school. Because of this, many of the mathematics teachers feel as if students responded poorly and need the structure of a standard high school day to succeed. While each student is different and some can and will succeed in a virtual setting, the pandemic has taught, or reassured us, that the average student needs a standard high school setting.

Virtual Adaptations

When the news of the pandemic broke in March 2020, schools shifted almost overnight to virtual learning. Unfortunately, this forced many teachers to learn on the fly how to run an online classroom. Many teachers from Centerville stated that of the many changes that they made during these times, teaching was not one of them. It was not the way that they taught that they changed, but the method in which their teaching was given to students. All teachers from Centerville stated that they began recording their lessons, a first for many teachers. Many teachers stated that they recorded themselves giving their lessons, either on an iPad, on their computer, or using a traditional chalkboard. In fact, many of the teachers stated that they enjoyed recording their lessons. One teacher pointed out that it was convenient for both in-person and virtual students. In addition to this, many teachers offered zooms for students who wanted real-person instruction in real-time,

but few students took advantage of this opportunity. Even though no students were present in class, teachers were still ready and more than willing to help.

In addition to the new modes of teaching, teachers were also forced with contacting students in new ways. No longer were students roaming the halls, popping in and out of classrooms throughout the day. This made contacting students particularly difficult and diagnosing student misconceptions nearly impossible. Some teachers held their own zoom meetings, but these were not required for students to attend. Many teachers said that the main method of communication between students and teachers was email. One reason for this could be the fact that most students were doing work on their own time, including emailing their teachers for help. However, most students relied on videos and notes that each teacher posted, completing assignments on their own time. While some classes, mostly honors and advanced placement classes still met over Zoom, the vast majority were asynchronous.

Anderson High School encountered their own problems during these times. Teachers were unable to require students to attend Zoom meetings, meaning that synchronous instruction was not an option. This led to many of the same results as in the Centerville school district. Teachers would create short videos of themselves teaching the given material and create corresponding assignments for each video. Many teachers found that cheating was a big issue (something that will be talked more on later), but it was hard to find ways to prevent this cheating from occurring. Many teachers noted that, in general, most students chose to not attend the Zoom meetings, but there was a slight uptick in students who showed up on days before tests. Because of these factors, it is easy to see why many students began to fall behind in their work.

Many of the teachers from Anderson also ran into the same problem as the teachers from Centerville. Because the school day was asynchronous, teachers would often have Zoom sessions

opened all day (sometimes from as early as 7:30 a.m. to as late as 4:00 p.m.) to accommodate as many students as possible. However, even with this large of block of time available to students, many students still chose to not take advantage of these zoom sessions. One teacher reported that “5 out of 150 students took advantage of this.” This contributed to the lack of communication between teachers and students. Many students began to not turn in work or communicate with their teachers. One teacher wrote, “Students that had a 4.0+ GPA (grade point average) would fail to submit multiple assignments in a row and even not do quizzes/tests.” From this, it is easy to see that not only lower achieving students struggled with their work, but higher achieving students as well. While outside factors including poverty and access to wireless internet may have affected how and when students were able to do their work, many students did not take advantage of the copious number of opportunities to receive the necessary help to succeed in their classes.

Both schools ran into many issues during the switch to virtual learning. Many high school students stopped doing work altogether or did the bare minimum to pass. While teachers often adapted their lessons as best as possible to accommodate the virtual environment, students were not taking advantage of the many opportunities to effectively learn in the virtual setting. As mentioned above, teachers were not changing the ways that they taught, but the mode in which the teaching was delivered. When asked about accommodating their lessons to the online setting, one teacher from Centerville stated that, “I like this method because it gives both virtual and in person students [the chance] to go back and watch the video again if needed.” Many teachers gained more experience with technology, allowing for the lessons to be more diverse and to be reusable. The videos, as stated above, were able to be re-watched multiple times in case students needed a reminder on their schoolwork while not in school. While many students failed to take advantage of this opportunity, this unique experience allowed for teachers to become more versed in

educational technology to better meet the needs of students in our ever-evolving, more technological savvy world.

Grading

With the switch to online learning, some teachers changed up the way in which they did their grading. Based on the change of assignments above, some teachers made the switch from giving completion grades to grading for correctness. Of the four teachers from Centerville who responded to the survey, two of them stated that they changed their expectations from completion grading to correctness grading. Some of this came from the implementation of a new technology, ALEKS. According to the ALEKS website, “ALEKS is a research-based, online learning program that offers course products for Math, Chemistry, Statistics, and more.” The program claims to have more than 20 years of research and analytics built into the program. This program helps both educators and parents understand what each student knows and provides individualized lessons and feedback to maximize each student’s learning experience. Two of the four teachers from Centerville have used ALEKS during the pandemic in their classrooms. According to one teacher from Centerville, “With ALEKS I have switched to grading for correctness. ALEKS provides examples, gives instant feedback, and allows multiple tries to show mastery of a topic.” This sort of program seems beneficial in helping virtual students learn the material and get some sort of instant feedback, like that of a normal school day. When combined with the video lessons and notes as above, students have some sort of normalized learning materials to help them during these times. While the online learning system ALEKS can never replace standard in-person instruction, it appears that it has helped many students navigate learning these hard times.

However, two of the four teachers from Centerville stated that they did not change their grading at all and still graded for completion. When asked if they had concerns about students

cheating, one teacher responded, “it is almost impossible to keep students from cheating on their assignment outside of the classroom.” These teachers decided that grading for completion was still the best way to grade their class. Perhaps these decisions came from the idea that the pandemic was challenging to both students and teachers and rewarding students with a completion grade on homework assignments provided a sense of normalcy and a break from the difficult time that all were going through. Or perhaps the teachers had too much work on their plate creating video lessons and new assignments, so the grading was one thing that they did not want to change. A third possibility is that many teachers simply did not care about making a change during this time, and let their own laziness dictate how they graded the class. Regardless, of the answer, one teacher’s thoughts on cheating sum up the idea of cheating in general: “if my students were cheating, it was not helping them.” Many tests and quizzes were still given in a setting where cheating was impossible. Because of this, the cheating grades on the homework assignments would not help students in the long run, which is perhaps another reason why these teachers from Centerville still felt as if completion grades were a good way of assessing their students.

The responses from the Anderson teachers were mixed, just like the teachers from Centerville above. Many teachers graded for completion, just as they did before the pandemic, but a few argued that grading for correctness was the better alternative in this scenario. On grading for completion, one teacher replied, “I was instructed (sic) to be more lax on grading my assignment. Most of them were counted as a completion grade in 2019-20.” Teachers who graded for completion stated that many of their assignments were open longer, available for multiple tries, and graded in a more lenient manner. This overall helped increase student grades but could have somewhat hurt students in the long run. Without the direct instruction of a teacher, grading for completion often neglects giving proper feedback to students. If mistakes are made, it is harder for

the students to see where they messed up on a given problem and why they messed up. Regarding grading for correctness, one teacher argued, “graded more for correctness than completion, because that was the only way to show them what they did wrong.” While grading for correctness could negatively impact the scores on students, it was a way to show students what they missed, why they missed it, and give them the chance to learn from their mistakes. The school in general seemed to be split nearly 50-50 on grading based on correctness versus completion. Both have their benefits and their drawbacks, especially during these difficult times.

In addition to these thoughts on homework, many teachers realized that their students were going to cheat. One teacher stated from Anderson stated, “As far as cheating concerns, very much so, found lots of cheating going on. They would rather cheat than ask me for help.” Students would much prefer to look the answers up or get them from a friend than ask their teachers for help. Realizing that there was not much that they could do to prevent this, some teachers gave in to the circumstances and let this sort of behavior slide, while others attempted to create their own problems to somewhat stop the cheating. While creating their own problems made it harder to cheat, it did not stop the cheating altogether, but rather, made students work harder to cheat. However, many teachers pointed out that cheating occurs during every school year, not just during the pandemic. A teacher from Centerville noted that, “With apps such as MathWay, PhotoMath, and Slader, it is almost impossible to keep students from cheating on their assignment outside of the classroom.” These sorts of apps or websites have built in step-by-step solutions that many students copy down instead of doing their own work. While this may help the student get the assignment done and give them a good grade on their homework (whether it be completion or correctness), without access to these sorts of tools on a test or quiz, many students failed those larger assignments. Given the data above, it seemed that many students forgot what the learning

process was meant to be and would rather just do the work to get it done rather than go through the whole process of learning a new skill. As one teacher from Anderson put it, “There is definitely concern over cheating, but there really isn't much we could do about it under the circumstances.”

Changing Classroom Climates

The pandemic, as mentioned above, forced many teachers to learn on the fly many new skills. Perhaps the biggest hurdle for many teachers was the integration of technology into the classroom. Many teachers before the pandemic used little to no technology, but because of the nature of virtual school, technology is a must. Some teachers were able to effectively adapt to the times and found new technologies and other method of teaching that they wish to keep when transitioning back to in-person learning.

Two of the four teachers from Centerville believe that using ALEKS when coming back in-person will still be beneficial to their students. Because of the nature of ALEKS, it allows students to work on problems designated to them that they need the most help on. Many schools began to invest more in online platforms called learning management systems, or LMS, for short. A learning management system is an online system that, “...stores and organizes data using servers and networks. It creates a digital learning experience, aiding teachers in the teaching and students in learning.” (McKinsey) Many teachers believe that continuing to record their lectures/class sessions and posting their notes on their LMS will be beneficial for all students. If students opt to learn virtually, they have the same materials that their in-person peers have access to, while the in-person students have materials to review for upcoming tests and quizzes. One teacher noted that their LMS, called Schoology, helped cut down the time it took for them to collect homework at the beginning of their class. The teacher wrote, “I will continue to have the

students turn their assignments in to Schoology. It cuts down on time of me going around the room to mark their homework grade down.” This allows this teacher the chance to review each student’s work individually without taking time out of their daily lesson to do so. Being able to continually adapt with new technologies that come out is something that many teachers were able to do during the pandemic, and some from Centerville have found merit in continuing to use these technologies or practices in an in-person setting.

However, not all teachers from Centerville feel the same way. One teacher wrote, “I do not feel like anything I did this year should be done again. Most of it was sporadic and last minute in planning. I can't wait to go back to regular, in-person instruction.” This teacher points out that due to the nature of the pandemic, some lessons had to change on a short notice. Students from Centerville could be contact traced and put into quarantine for two weeks, meaning that some teachers would start the week with a class full of 20 students and end the week with as few as 8 or 9. Add in the fact that some students who were contact traced would be coming back in-person when their quarantine was up and you have a revolving door of students on a day-to-day basis, meaning that a teacher often would not know exactly how many students to plan for on any given day. Because of the fluctuating number of students, it was hard to plan exactly what to do with the students in class. This teacher notes that they much prefer regular, in-person instruction, presumably without the virtual option. This would be beneficial to many students as the return to full in-person would put every student on the same playing field, without any students at home and would additionally help each teacher out as they would not have to worry as much about ensuring that certain files or videos are put onto Canvas. However, another teacher noted that, “Because I currently have students in person and virtually, I have been recording my lessons using Zoom and then posting them on Schoology. I have had students tell

me they will sometimes go back and watch a certain video when they are studying for a test.” The virtual students are not the only students that are benefitting from the videos and notes that are put online. These videos provided references for in-person students, especially if they are forced to miss time, or if they were unable to complete notes in class. In-person students can go back and watch a video lecture as many times as they need to understand the material. While it is most definitely more work for the teacher, the benefits for all students, regardless of the mode of learning, cannot be overlooked.

Many teachers from Anderson have the same sort of experiences. The LMS that Anderson uses is called Canvas, and much like Schoology, allows teachers to create assessments, post instructional videos, and notes, and provide feedback to students. Many teachers have stated that they plan to continue using Canvas even with a return to full in-person, as the benefits of using it are immense when implemented correctly. Other teachers noted that using YouTube to find videos or post their own was beneficial in these times. Many teachers stated that they enjoy having Zoom calls readily available for students who are still virtual or who miss days. This way, students can catch up on their work and stay on top of their schoolwork even when life gets in the way.

Whether used for grading assignments or for distributing schoolwork, most teachers from Anderson agreed that using more online tools were beneficial in the classroom. However, a few still wished for a return to pencil and paper. One teacher noted that while they want to keep some online, they still want to “Go back to notes and paper.” As noted in the Centerville case, some teachers from Anderson still wish to use more notes and papers in their schoolwork. While this works fine for the students who are in-person, it does not help students who are virtual or who miss days. Notes, as mentioned above, can be posted online in some sort of fashion that makes

students watch the videos, such as guided notes for a grade. Assignments can be put onto a LMS as a PDF that allows students to upload an image of their work, or simply put into the LMS as an assignment that can grade itself and give instant feedback. While paper and pencil are fine in many instances, many teachers have been in favor of an LMS simply because it has proven to make life just a little bit easier.

Clearly, teaching during the virtual setting had to be changed. As students were no longer attending schools in-person, LMSs such as Canvas and Schoology became a necessity that teachers learned how to use. Many teachers initially had negative reactions to this sort of technology, but as they became more fluent in the program, they began to see how an LMS would be beneficial to us during an in-person learning environment as well. While this paper is not trying to argue that using an LMS is a one-sized fix all for learning in a virtual setting, the options that an LMS provides and provided for teachers in this time helped them navigate teaching during the pandemic. Because of these facts, LMSs have helped teachers out tremendously and should be something that each teacher considers using (whether the school board asks them to or not) in their teaching future.

Personal Growth

A last, optional question was provided to teachers on this survey asking them, if they had any additional information that they would be willing to share about their experiences during these times. The teachers were not given any sort of guidance about this question and were able to say anything that they wanted to about their students, learning environment, etc. Many teachers chose not to answer this question as it was optional, but the ones who did provided interesting feedback into what they went through during these times.

From Centerville, two of the teachers answered this question. One teacher stated that, “I would say teachers at our school have put in about 30% more work than a normal year. Part of that is because of some students working from home while you also have the majority in person.” When thinking about the situation that many teachers have been put into, stating that they have had about 30% more work this year compared to that of years past is something that does not seem too far off. At Centerville, teachers returned hybrid beginning in the 2020-2021 school year, meaning that they had both in-person and virtual students. By needing to prepare materials for both sets of students, teachers essentially had an additional job that they were doing daily. As this teacher puts at the end of their quote, “It has been VERY challenging!”

In addition to this, another teacher answered that they were able to adapt quickly and learn the technology that is needed to succeed in an online learning environment, something that benefitted them during the pandemic and the 2020-2021 school year. However, this teacher was a firm believe that mathematics should not be done online and should be done on pencil and paper, stating that multiple choice tests were not a good indicator of student knowledge. By writing down their work and showing their logical steps, teachers are more able to deduce when students do not understand given material. Additionally, it is hard to gauge what a student actually knows by having them answer a multiple-choice question. This teacher noted that while using an LMS and technology is fine for presenting material, it should not be used for testing what they know.

From Anderson High School, three of the teachers provided valuable insight into what they learned during the pandemic. One teacher noted that they joined a book club that that discussed the emotional wellbeing of students during the pandemic. This teacher wrote, “There are a lot of students that NEED to be at school for the academic factors as well as the social and

emotional well being [sic] of the students (and teachers too!).” The teacher notes that the in-person learning setting is more beneficial to students, as it gives them an environment that promotes learning and creating social connections with others. By being around their peers, students can talk about their feelings, their schoolwork, and whatever else they need to succeed during in-person instruction. However, in the virtual setting, these students lose the social connection and go through their own struggles. Another teacher notes that in the Anderson school corporation, “...very few students have a support system in place at home to encourage virtual learning. No matter how much a teacher tries, many students WILL fall behind without attending school.” For some students, school is a place that allows them to feel connected to others, and to feel wanted. Without an in-person setting, some students completely lose these feelings, leading many of them to fall behind in their schoolwork. No matter how hard the teacher tries in the virtual setting, many students would fall behind. As one teacher notes, “This was a very hard lesson for me to learn.”

These teachers pointed out that while it was a very difficult time for themselves, students were also going through many struggles. Without the in-person setting, many students fell behind or were at risk of falling behind. In addition to these thoughts, teachers believed that mathematics needed to be done on paper. While an LMS is a great way to present information and organize an online class, testing students is something that needs to be done on pencil and paper.

Conclusions

As expected, many teachers struggled during the switch to virtual learning. While some struggled due to a lack of knowledge of how to use technology, others struggled to find meaning

in their work. However, some teachers were able to point out some silver-linings found hidden within the tangled mess that was the COVID-19 pandemic. Learning managements systems such as Canvas and Schoology provided teachers with an easy way to organize and present information. Some teachers found that recording and posting their notes was beneficial for both virtual and in-person students, giving each the opportunity to review work on their own time. In addition to this, Zoom was a great way to meet with students who were virtual or absent, giving them the chance to meet in a one-on-one setting with their teacher to stay caught up on their classwork. The increased use of technology has both created more work for teachers when it comes to presenting information but has made their lives a lot easier when it comes to grading information.

By hearing the voices of those teachers who worked through the pandemic, appropriate changes and modifications can be made to effectively improve teaching in the future. Just like any other job, teaching is an ever-evolving field that requires teachers to stay up to date on the latest, most effective way to teach students. The COVID-19 pandemic presented many teachers with many obstacles to overcome. Some faltered and left the teaching profession for various reasons, but the switch to virtual learning is what prompted most of them to leave. However, those who stayed and tried to become better educators during these trying times have shown to the world that teachers are not only necessary workers, but heroes whose work is never done.

Appendix

The following were the given questions on the survey.

1. What school do you teach at?
2. How did your students respond to going virtual due to the COVID-19 pandemic (morale, participation, learning styles, etc.)?
3. What changes did you make to your teaching, if any (direct instruction via zoom, instructional videos, asynchronous instruction, etc.)?
4. How did you meet with students, if at all during this time (required zoom meetings, emails, asynchronous instruction, etc.)? Was the school day structured differently at all, or was it like a “normal” day at school with a set schedule?
5. Do you think these changes were effective? If so, why? If not, why not?
6. Did you change up your assignments to fit a virtual learning environment or were they like those that you gave pre-COVID (i.e., more multiple choice/online assignments, problems from a book, etc.)?
7. Did the way that you graded assignments change(i.e., grade for more completion over correctness, graded normally, etc.)? Did you have any concerns of cheating during these assignments?
8. Is there any specific technology, school platform, or media source that you found to work during this time? If so, what is/was it?
9. How did you attempt to keep students motivated during these times?
10. What changes did you make that you want to keep when you go back/went back in person, if any?

11. (Optional) Do you have anything else that you would be willing to share about this time, such as something you learned about yourself, your students, etc.?

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