

Educator Mindsets and Perceptions of Instructional Technology:  
Effects from the Year of Emergency Distance Education

by

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## DISSERTATION ABSTRACT

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Doctor of Education in Educational Methodology, Policy, & Leadership

Title: Educator Mindsets and Perceptions of Instructional Technology: Effects from the Year of Emergency Distance Education

The integration of digital technology in public K-12 classrooms has been an evolving topic over the past several decades. As technology services and systems become more ubiquitous in everyday life, their implications for enhancing public education have been increasingly promised with varied results. Up until 2020, the integration of instructional technologies in schools and classrooms has been a gradual, methodical process largely due to teacher apprehensions. When schools closed in 2020 due to the COVID-19 pandemic, this once-gradual process became much more sudden for many schools and teachers. This rapid adoption of technology, whether teachers were ready or not, has led to a polarization of teacher mindsets and perceptions regarding technology. Where some teachers have gotten over their apprehensions and now embrace technology more, others are more resistant in response to the side effects of the rapid implementation. This mixed methods study surveyed 24 middle school teachers with two follow-up qualitative methods (an interview and a focus group). Key findings included an increased familiarity with technology, a desire for ongoing professional learning, and concerns of overdependence of technology by students.

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## TERMINOLOGY

- “1:1 programs” are initiatives sponsored by schools or districts that provide one computing device for every one student.
- “educational technology” or “instructional technology” may be used interchangeably, both describing the specific application of digital technologies (computers/tablets/laptops and related hardware, software applications, Internet services, etc.) for educational purposes.
- “non-digital” refers to the aspect of teaching tools and practices that may be considered less technological in nature in comparison to the more modern, technological teaching tools and practices largely adopted during the YEDE.
- “Year of Emergency Distance Education (YEDE)”, spanning the educational time between mid-March 2020 and end-June 2021, where nearly every public education institution in the United States was mostly or entirely physically closed to students and the public—all educational services were either suspended or conducted in part or in whole using technological methods including video conferencing and learning management systems with educators and students participating from remote/distance locations (i.e., homes).

## CHAPTER I

### INTRODUCTION & LITERATURE SYNTHESIS

The promise of computer technology to improve education has been extolled by technology companies and enthusiasts since the 1940s when the first computers started cropping up on university campuses. Over the subsequent decades, technology in general has seen a steady, if not exponential, rise in prevalence in everyday life. From 2000-2020, K-12 schools and districts saw a steady rise in technology integration (Ross, 2020); from computer labs to 1:1 programs, from keyboarding classes to digital moviemaking and manufacturing. As technology has become more commonplace in our everyday lives, educators and students are likewise seeing increased technological presence in schools and classrooms. Until recently, however, in the spring of 2020, the adoption of technology in U.S. schools has been varied depending on the schools'—and in many cases, the individual teacher's—comfort levels around technology (Edelberg, 2019).

In March 2020, with the onset of the COVID-19 pandemic, schools and districts were forced into what would become a year of emergency distance education (YEDE). Unable to conduct education as usual, educators and students had to adapt to a very different, electronically facilitated model whereby they would join class from their homes in isolation, communicate using video conferencing platforms such as Zoom and Google Meet, and transact educational artifacts by way of learning management systems such as Canvas, Google Classroom, and Seesaw. With little to no training for many of these individuals, it was an entirely new learning process with plenty of growing

pains and subsequent frustrations and perceptions of failure along the way. Now, as we continue extricating ourselves from the rubble of the YEDE, educator mindsets toward technology—which pre-YEDE were overall very positive and upward-trending (Common Sense, 2019)—are experiencing a backslide as residual frustrations from the previous year are causing educators to say, “enough technology” and throwing up roadblocks in the continued implementation of innovative instructional technologies (Reich, 2021).

### **Looking Back**

Some saw them as a gleaming silicon path to the new age of educational enlightenment; others as a rickety rope bridge over alligator-infested waters. Still for others yet, they were just computers. 1:1 programs have been viewed as the technological flagship or keystone of 21<sup>st</sup> century classrooms, so with decades of computer technology in the classrooms and more schools employing 1:1 programs than ever before, why does the debate persist as to their effectiveness, ongoing curricular incompatibilities, operational headaches, and negative stakeholder perceptions?

Perceptions of the presence of technology in the classroom have varied since long before the first computers were placed in schools in the 1970s (Fouts, 2021), all the way back to the 1920s-30s debate of whether typewriters belonged in the classroom to augment existing curricula—with early evidence showing improvements to spelling, writing, and reading (Cothran & Mason, 1978)—or if they were better suited in their own separate space (an analog precursor to the modern computer lab) for the purpose of teaching discrete typing skills for a future career involving typing. This debate has continued since, picking up momentum these past 20 years following the passage of the

No Child Left Behind (NCLB) Act of 2001 and its goal that schools and districts actively work to close the digital divide “...by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student’s race, ethnicity, gender, family income, geographic location, or disability.” (No Child Left Behind, 115). By the time of NCLB’s passage, computers and computer technology were increasingly present in classrooms across the country, with the national average student-to-computer ratio of 6.6:1 in 2000, almost halving that number to 3.8:1 in 2005 (Digest of Education Statistics, 2019). Around this time, the President’s Committee of Advisors on Science and Technology (Cattagni & Farris Westat, 2001) stated that the ideal student-to-computer ratio was 5:1. Not long after, an educational technology expert named Seymour Papert made a historically convincing argument in favor of a 1:1 ratio, ultimately impacting policies across the country.

In 2000, following conversations with his friend Seymour Papert, Maine State governor Angus King proposed the formation of what would eventually become the Maine Learning Technology Initiative (MLTI). Utilizing a budget surplus from 1999 and responding to the recommendations of a 17-member legislative task force, the Maine legislature ultimately approved the MLTI proposal and funded the purchase of a laptop computer for every student enrolled in seventh and eighth grade across the state for the 2002-2003 school year (Gravelle, 2003). Recognizing that devices alone were not in and of themselves the answer, the task force also identified as key components of the program network infrastructure, database and software access, allocated budgets for the repair and replacement of equipment, and—perhaps most importantly of all—rich,

meaningful professional learning for all teachers in the program (State of Maine, 2001). In doing so, Maine not only became the first state to create and fund a 1:1 program of this magnitude, but also the first state to address the access barrier to technology in a significantly holistic way. Students in schools and districts of all backgrounds and sizes across the state immediately had access to the same high-quality technology resources for use in their education, and teachers had the training and encouragement necessary to focus on their instruction and not on the logistics or technical details. Other states and districts started following Maine's example, and by 2020 one study indicated that on average more than 50% of students in the United States were participating in a 1:1 program through school (Klein, 2021). These numbers would jump substantially (and entirely unexpectedly) just a year later.

With the COVID-19 pandemic, schools and districts across the world were suddenly forced into immediate, full-scale implementations of 1:1 programs with little or no preparation or training for their teachers, students, and families. The goal was clear: Continue to keep students engaged in school from the safety of their homes. An entirely new educational vocabulary including Zoom, hotspot, and Chromebook became intermingled with more established terms such as homework, backpack, and formative assessment. This abrupt departure from non-digital schooling has had both positive and negative consequences for those promoting 1:1 programs. The sample size of classrooms engaging in 1:1 has exploded, providing a much larger dataset than before to plumb on 1:1 perceptions and effective strategies. According to a study by EdWeek, 1:1 implementations for elementary-aged students nearly doubled as a result of the

pandemic, and middle school and high school students saw nearly 30% increases (Klein, 2021). However, the need for speed with these rollouts sidestepped much-needed handholding and deep professional learning critical to transforming the learning into something meaningful, ultimately leaving teachers, students, and parents feeling dissatisfied with how much time they were spending looking at computer screens and averse to technology integration upon the return to in-person instruction (Frazier et al., 2021). As schools returned from the yearlong distance-learning model that required these digital tools, some have since questioned whether to sustain their new 1:1 programs based on budgetary and pedagogical uncertainties. The long-term effects of the pandemic on education in general are still in many ways mysterious to all those involved, not the least of which are those related to the innovative and technological buy-in of stakeholders in moving forward.

As students and teachers returned to their classrooms, school and district administrators were encouraged to take advantage of this rare opportunity to have collaborative conversations with their teachers around 1:1 (Gonzales & Jackson, 2021). *What worked? What did not? Where are the gaps in professional learning? Where does this make sense (and where does it not?)* The YEDE highlighted and expanded existing technological gaps, and as we get further out from that time period, we are beginning to identify the new gaps that it has helped create or foster; most notably, student technological dependence. As we continue looking ahead in our post-YEDE educational landscape, we need to be ready for a more universally modern approach to education: there is no putting the Nyan Cat back in the bag.

## Looking Now

The problems reported with 1:1 implementations seem to have little to do with the 1:1 model itself and more to do with the overall integration of technology into education. The core essentials of the United States public educational system have largely remained unchanged over the past 50 years: Students are organized into grade levels based primarily on age; the school week spans Monday through Friday; schools and districts adopt common curricula that all their teachers follow; even the decades-old “three Rs” adage of reading, writing, and arithmetic still represent the two most-focused upon content areas in schools today (language arts and mathematics).

To be fair, there have been many important additions and modifications to the educational system during that span. The Americans with Disabilities Act (ADA) of 1990 and Individuals with Disabilities Education Act (IDEA) of 1997 helped ensure equitable access to free and public education for all students, the widening adoption of standards-based education changed how schools approach the topics of assessment and reporting, the exploding popularity of STEM (Science, Technology, Engineering, Math) and STEAM (Science, Technology, Engineering, Arts, Math) programs have fueled a new wave of experimental inquiry-based curricula, and the growing expansion of technology capabilities and offerings in the classrooms have extoled from their unboxing the promises of innovative changes to how our teachers instruct and how our students learn. Regarding the latter, a growing concern among school leaders has focused on the stalled-out nature of those technological promises, where schools have closely followed the recipe of purchasing technology, deploying technology, supporting the technology,



and training their teachers on the technology, but the end results are not the shiny, transformed, 21<sup>st</sup> century classrooms pictured on the box (Salomon, 2002).

In a 2007 study, Abdulkafi Albirini succinctly summarizes what they refer to as the misalignment between technology and education:

On the one hand, electronic technologies seek to democratize learning, to decentralize instruction, to reorganize instructional material, to increase access to multiple information resources, to remove hierarchies in communication and interaction, to enhance students' collaboration and exploration, and to obliterate the stringent structure of the classroom... On the other hand, the educational system rests on such assumptions as top-down management, teacher control, textbook authority, hierarchy, competitiveness, individualism, structured classroom, linearly structured activities, discipline, lecturing, knowledge banking, uniformity, locality, and face-to-face interactivity... Such disparity in assumptions exhibits the uncomplimentary relationship between the two and foreshadows the tense integration of the former into the latter. (p. 231)

Albirini suggests that the “failures” of educational technology result from applying the layer of technology—even one as expansive as a true 1:1 program complete with all the technical supports and teacher professional learning opportunities—directly over the top of the existing educational model with no substantial changes made to the underlying system. Interestingly, this may be due to the very nature of the current model of public education, a phenomenon Salomon (2002) describes as *the technological paradox*: “the consistent tendency of the educational system to preserve

itself and its practices by the assimilation of new technologies into existing instructional practices... knowledge is to be transmitted top-down from those who know to those who don't" (pp. 71-72).

This institutional resistance to change can be a powerful barrier to overcome. The educational system is a complex one with innumerable moving parts and interconnections, and topics such as change and reform can be monumental undertakings. Teacher perceptions should similarly not be underestimated in their impact on the effectiveness of technology in the classroom and may, in fact, be one of the single most-influential factors in the make-or-break outcomes of both 1:1 programs and non-1:1 educational technology initiatives. Perhaps a testament to Papert's claim that true educational technological enlightenment can only happen when student access to computers is on a "sufficient scale," Sauers and McLeod (2017) concluded that there was a significant impact of a 1:1 program on teacher attitudes and behaviors toward technology integration versus non-1:1 technology deployments.

### **Looking Ahead**

Given the program's incredible scope and historic significance, many eyes were on the MLTI implementation from the get-go. A year into the deployment, some observations were made in a 2003 paper for the Center for Educational Policy, Applied Research, and Evaluation (CEPARE): "One note of caution: It is important to remember that the digital divide is about more than just access to computers and the Internet" (Gravelle, 2003 p. 16). Among the specifics they cite are the need for universal access to up-to-date resources, effectively-trained educators, and visionary and supportive

leaders. Perhaps in part due to the observance of these and other recommendations, Maine’s visionary 1:1 program continues to play a strong and present role in its schools to this day, having undergone its “MLTI 2.0” rebranding within the last two years and expanding the eligibility from seventh and eighth grades to also include fifth, sixth, ninth, and tenth grades across the state. Maine, it seems, has found the right set of conditions for a 1:1 program to live up to at least some of its promises of innovative education. So, can it be replicated?

The rapid implementation of distance learning technologies in response to the YEDE has polarized the continued adoption of instructional technology going forward concurrently increasing resistance to implementations of (or even conversations involving) innovative approaches to technology integration. Quite a bit of research is being conducted right now on every aspect of public education through the lens of the YEDE, providing a steady stream of current research on educator/administrator, student, and parent mindsets—including and especially those pertaining to technology, as “technology” became the physical embodiment or poster child of the YEDE. It is reasonable to acknowledge that the perceptions toward technology alone are not the sole culprit. The larger effects of the YEDE may have contributed to an overall sense of “change fatigue” for educators, students, and families alike, with less to do with technology-based changes and more to do with changes in general. In other words, current resistance toward implementations or conversations of implementations of instructional technology integration may not be indicative of perceptions toward the technology integrations themselves; rather, educators may simply be wanting to focus

on “righting the ship” after the YEDE before engaging or entertaining engaging in additional, newer considerations—technological and otherwise (Anderson, 2021).

As a longtime technology educator working directly in this space and advocating for meaningful, innovative application of technology to transform educational experiences, I am keenly interested in how this once-in-a-lifetime event impacted mindsets toward education; more to the point, what has it done to impact the decades of methodical and determined technology advocacy in education. This study was conducted with a goal of understanding perceptions of educational technology—primarily those of classroom teachers—post-YEDE, with a longer-term intention of determining a reasonable yet still innovative path forward to get back on track with technology integration efforts.

To better understand this topic, I focus on one public school district which first implemented its 1:1 program in response to the YEDE and is now settling into its new 1:1 reality several years later. This suburban district in the Pacific Northwest, like so many others, pivoted on a moment’s notice to a 1:1 technology program. For the first year—spent almost entirely in distance learning or hybrid—the students’ devices served a very specific, very immediate, and very limited purpose: provide a communication channel to allow remote learning. As the district moved back to in-person instruction the following year, the question on every teacher’s lips has been the same: *Now what?*

## CHAPTER II

### METHOD

This study examined middle school educator perspectives on the 1:1 program and interventions provided by district and school leadership to support professional growth and adoption of innovative practices. Through researching these perspectives, my intention was to draw conclusions on what teachers identify as necessary for effective student learning, whether that be technology use, or in some cases, its absence.

#### **Positionality Statement**

In the context of this study, I held two key roles: the sole and principal investigator of the study, and also the director of technology ultimately in charge of all technology programs, equipment, and services for the district being studied; and I therefore acknowledge that my positionality may have influenced this study to some extent. Participants knew of my administrative role prior to their participation in the study and explicit language was included in communications to them that their participation, or lack thereof, would in no way negatively affect their relationship with the district. It was also communicated that the findings of the study would be shared with the district leadership team to help inform future technology decision-making. My professional relationships and reputation with the participants may have benefitted the study by providing an element of legitimacy as well as a trustworthiness that the content of their participation would be reviewed and applied to technology decisions directly affecting them and their students.

## **Research Design**

This study utilized a mixed methods approach including a survey (quantitative), an interview (qualitative), and a focus group (qualitative) to answer the research question: Has the year of emergency distance education (YEDE) impacted teacher mindsets regarding implementing instructional technology? Quantitative data from the survey were collected, analyzed for comparison, and reported in tabular format. Video recordings of the interview and focus group were transcribed using an online artificial intelligence (AI) transcription tool called Cockatoo, then manually reviewed for accuracy, member-checked for validity, qualitatively coded, analyzed for themes, and reported.

The purpose of this mixed-methods study was to gain a clearer understanding of how and to what extent the YEDE impacted K-12 educator mindsets regarding instructional technology. The quantitative aspect of this study focused on the comparison of educator mindsets pre- and post-YEDE to determine (a) if there was a significant difference in mindsets toward instructional technology between these time periods, and (b) whether the net result was an increase in positive (pro-technology) mindsets, an increase in negative (anti-technology) mindsets, or an increase in neutral mindsets (not strongly positioned one way or the other). To provide greater context to these questions, additional qualitative data were gathered from the interview and focus group and analyzed to illustrate specific examples and rationale for any observed differences in mindsets.

## **Setting**

This study was conducted in a K-12 public school district in the Pacific Northwest region of the United States. The district is mostly rural and medium-small in student enrollment; comprised of four elementary schools, two middle schools, one high school, and two alternative schools; altogether employing approximately 500 faculty and staff and serving approximately 5,500 students. The district is funded primarily through state allocations and augmented by local capital and educational programs and operations levies. The student population is approximately 73% white, with the next two largest segments being Hispanic/Latinx (15%) and Two or More Races (8%). The community served by the school district has a steadily growing population, which district administrators attribute to the successful efforts of the community to attract technology business expansions from the nearby larger metropolitan area.

## **Participants**

Participants in the study were conveniently sampled middle school (grades 6-8) teachers from the aforementioned K-12 public school district. All 65 certificated middle school teachers employed by the district—including gen-ed, special education, and specialists (art, music, physical education, etc.)—received an invitation to complete the survey, with a restriction that only those teachers who were employed in the district both before and after YEDE should participate. Of the 65 invited teachers, 25 completed the survey; however, during data collection it was determined one of the participants erroneously received the invitation to participate and due to their status as an elementary teacher, their survey response was removed from the dataset, leaving 24

valid responses to the survey, a final response rate of 37%. Of those teachers who completed the survey, a subset of four agreed to participate in either the interview or focus group.

### **Sources of Data**

I used three data sources for this study: a survey, an interview, and a focus group. The initial study design only planned for one or multiple focus groups, however after the focus groups scheduling process concluded, one would-be focus group only included a single participant which then became a one-on-one interview. The interview was formatted the same as the focus group with the same set of questions.

All participants were administered the survey first and a subset of survey respondents participated in either the interview or focus group after. To comply with the requirements of the Institutional Review Board (IRB) protocol governing the study, no identifying or demographic information were solicited from participants. Thus, the only known information about the sample is that all participants were educators who taught middle school before and after the YEDE at one of the public schools targeted in the study.

The selected instruments and items were primarily chosen based on two criteria: addressing literature gaps and maximizing participation efficiency. Though instrumental in creating a foundation for this study, the literature current at the time of this study seemingly danced around the research question of whether teacher mindsets changed as a result of the YEDE, addressing such topics as teachers' preparedness *prior* to the YEDE (Webb, 2021), 1:1 implementation experiences at the *onset* of the YEDE (Frazier,



2021), teacher experiences and frustrations *during* the YEDE (Francom, 2021), and the future of instructional technology *post*-YEDE (Reich, 2021), but none of the literature addressed the direct comparison of teacher mindsets pre- and post-YEDE.

The second criterion in the selection of the instruments and items was the need for maximum efficiency on behalf of the study's participants. Acknowledging the busy nature of the teaching profession and in an attempt to mitigate potential validity concerns of a small sample and high attrition, the survey was developed to directly address the research question with two brief sections of five Likert-scaled items each, a third brief section (also containing five Likert-scaled items), and a fourth section of four open-response items—all items being optional. The interview/focus group portion of the study was designed to be more involved, believing those who would opt to participate would do so with the understanding of its longer time commitment. Even so, these qualitative sessions were scheduled as close to the survey completion as possible to maximize potential for participant involvement.

### ***Survey***

Building administrators and technology staff were informed of the survey prior to its distribution to the participant sample so that they could field basic questions from their teachers (i.e., "Is the study and survey request legitimate?") and to gently encourage participation by reassuring teachers their participation would be anonymous, would not in any way negatively impact their position, and would directly inform district-level decision-making regarding instructional technology. The survey was created and distributed via Google Forms to the participants' district-issued email

addresses, with survey responses recorded anonymously and separate from their district email addresses.

Items comprising the survey were divided into four sections. The first two sections used the same five Likert-scaled items from two different periods of time: pre-YEDE and post-YEDE (see Table 1).

**Table 1**  
*Survey Sections 1 and 2: Items Related to Experiences Pre- and Post-YEDE*

Survey Item	Pre YEDE	Post YEDE
I regularly implement(ed) technology in my lessons.	(1-5)	(1-5)
I find/found value in educational technology.	(1-5)	(1-5)
I find/found my students do better in lessons or assignments that involve technology.	(1-5)	(1-5)
I feel/felt comfortable using technology in my lessons.	(1-5)	(1-5)
I was/am open to trying new things involving technology.	(1-5)	(1-5)

*Note.* Likert scale = 1 – Strongly Disagree | 5 – Strongly Agree.

The third section of the survey included five Likert-scaled items that engaged participants in some deeper self-reflection of how their mindsets toward technology may have changed as a result of YEDE (see Table 2).

**Table 2**  
*Survey Section 3: Items Related to Self-Reflection of Mindsets*

Survey Item	
I find that my feelings about technology integration have changed.	(1-5)
I prefer to use more traditional/non-technology approaches in class.	(1-5)
I find that my students have a higher expectation for technology use in their learning.	(1-5)
I feel that the nature of education has changed because of technology.	(1-5)
I feel I have been given adequate professional resources to effectively use technology.	(1-5)

*Note.* Likert scale = 1 – Strongly Disagree | 5 – Strongly Agree.

The fourth section of the survey was comprised of four open-ended response items that encouraged participants to share additional insights into instructional technology that could provide greater context and direction for this and perhaps future studies (see Table 3).

**Table 3**  
*Survey Section 4: Open-Response Items*

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Survey Item
What types of professional learning would best support you in implementing educational technology in your classes/lessons?
What resources beyond professional learning do you identify as necessary to effectively implement educational technology in your classes/lessons?
Describe any barriers or obstacles you have faced related to implementing educational technology in your classes/lessons?
Please feel free to share any other thoughts you have related to technology use in your classes/lessons and ways in which your experiences during YEDE have impacted your thoughts related to technology use.

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The final question of the survey asked participants if they would like to receive information on potentially participating in the interview/focus group portion of the study. The survey window lasted two weeks, from January 11-26, 2024. Survey responses were reviewed to ensure any identifying information was removed and participants were randomly assigned numbers ranging 1-24 so they could be individually and anonymously identified and tracked during data analysis and reporting.

***Interview and Focus Group***

Participants who indicated interest in learning more about the qualitative portion of the study were contacted via their same district-issued email addresses with possible dates and times for the focus groups to be conducted via Zoom. Initially, 14 survey respondents indicated interest in participating in the focus groups; however,

during the scheduling process 10 potential participants willingly withdrew from consideration, leaving four teachers who participated. Based on participants' preferred meeting times, one focus group had a single participant and thus instead became a one-on-one interview (Participant #14 "Jessie") while the second focus group had three participants (Participants #03 "Blake", #11 "Colby", and #19 "Daniel"). Pseudonyms were assigned to mask participants' identities.

The interview and focus group were conducted via Zoom just after student dismissal on separate school days—27 and 28 days after the initial survey window closed. Zoom session information as well as a link to the Consent for Research Participation that they were asked to review were sent to participants' district-issued email addresses. At the start of the Zoom session, all participants were asked to indicate their consent to participate and be recorded, then I read the following script:

*Hello, thank you for agreeing to participate today. My name is Matt Jurick, and the purpose of this interview/focus group is to inform a study I am conducting to determine what influence the year of emergency distance education—from March 2020 through June 2021—had on K-12 educator mindsets regarding educational technology, what strategies are effective in promoting positive, pro-technology educator mindsets, and what are the barriers or obstacles to educational technology adoption. Your feedback is vitally important in answering these questions and your time is greatly appreciated. Before we begin, I am going to post the Informed Consent form to the room and ask that you read and sign if you consent to participate today. You should have received the Consent for Research Participation for this focus group via email prior to today that outlines the details of your participation. If you would like another copy of this document, I am going to post a link to it in the chat window now.*

*For the sole purpose of ensuring accurate transcription of the comments shared, I will be recording the audio, video, and text of this session. No identifying information, beyond your voice and visual likeness, is being retained. By consenting to participate, you are consenting to this use of recording. Once you/everyone has completed the form, I will start the recording and we will*

*begin. If you have any questions regarding the consent process, you may privately message me via the chat window. [For the focus group:] One last important note: It is understood that you may likely know some or all of the other participants in the focus group. As I make all reasonable efforts to maintain the privacy and confidentiality of the words shared here today, I similarly request that all of you do the same. Please keep confidential and private everything shared here today, with the sole exception if any of us as mandatory reporters are legally required to break that confidentiality for those defined purposes. Thank you, and with that I will now put up the Informed Consent form.*

*This interview/focus group should take approximately 45-60 minutes depending on the depth of your responses. The format of this interview/focus group will be open discussion. [For the focus group:] I will pose a question to the group—both verbally and in the chat window—and invite any member to contribute their thoughts. Others may build upon previous comments or opinions, and all thoughts are welcome and appreciated here. Please be respectful of one another and allow everyone to share their thoughts unencumbered.*

Once participants confirmed their consent, we began with the first set of questions that addressed their mindsets toward technology pre-YEDE (prior to March 2020). To help put participating teachers in that frame of mind, I read a series of news headlines from both the local newspaper (omitted here for confidentiality) as well as some national headlines. I used the following script:

*If you're ready, we can begin with the first set of questions. For this first part, I'd like you to think back to the 2019-2020 school year before the COVID-19 pandemic shutdowns in March. To help put you in that frame of mind, I encourage you to close your eyes as I read some headlines during that time from [the] local newspaper, [omitted]:*

*- [four headlines omitted]*

*As for outside of [omitted], here are some of the big news events during that time:*

- Actress Felicity Huffman was sentenced in the college admissions scandal*
- The very first season of the Star Wars series The Mandalorian premiered on Disney+*
- The proceedings for Donald Trump's first impeachment trial began*
- Musician The Weeknd released his hit single Blinding Lights*
- Kamala Harris, Bernie Sanders, Elizabeth Warren all drop out of the presidential race*

- *Kansas City Chiefs claim first victory in 50 years over the 49ers at Super Bowl LIV*
  - *Movie Parasite won Best Picture at 92<sup>nd</sup> Academy Awards*
  - *Harvey Weinstein was found guilty of rape, igniting the #MeToo movement*
  - *Breonna Taylor was shot and killed by police officers in Kentucky*
  - *Tom Brady left the Patriots after 20 years to join the Tampa Bay Buccaneers*
- Okay, hopefully you can put yourself in that time before COVID. With that frame of mind, we'll start with the first few questions. Try to stay in this past state of mind if you can:*

1. *Think about your classroom on an average school day and describe the instructional technology that you and/or your students would have been using.*
2. *Describe your feelings or attitudes toward technology use. Were you a keen adopter or more reluctant to jump in?*
3. *What were some barriers or difficulties you encountered trying to utilize instructional technology?*

The second set of questions focused on early-YEDE/transition-to-YEDE (March 2020 – June 2020).

*Now let's move into that next phase of March of 2020 when short-term closings turned into long-term and then into year-long. Material packets were being printed, pickup lines were formed, and Chromebooks and hotspots were being handed out to students through car windows. Everyone was asked to start using services like Zoom and Google Classroom to facilitate distance learning. Services like WeVideo, Screencastify, and Incident IQ were rolled out. Okay, now that we're in that frame of mind, here are the next couple of questions:*

4. *What were your initial reactions specifically about the technology aspects during these first few months of remote learning?*
5. *Can you describe your comfort level with the technology? Was there a steep learning curve, or was it pretty natural?*
6. *In your experience, regarding the education taking place during that time: did the technology element improve the situation, make it worse, or did it have no significant effect?*

The third and final set of questions targeted YEDE (September 2020 – June 2021). The following script guided the focus group discussion.

*Finally, let's think about now. We're several years out from that year of emergency distance education. Our students have been back in school, activities have returned to normal, face shields, masks, and other PPE have*

*largely vanished—but the increased presence of technology has remained. We are now a full 1:1 district from K through 12, all teachers have laptops, and many of the services we brought on in March 2020 such as Google Classroom, Zoom, and WeVideo remain. With this frame of mind, here are the last four questions of today’s interview/focus group:*

- 7. What are your feelings or attitudes toward instructional technology at-present?*
- 8. How do you think your mindsets toward instructional technology have changed over the course of the past few years since March 2020?*
- 9. What types of professional learning or other resources would best support you in implementing instructional technology in your lessons?*
- 10. What are barriers, obstacles, or concerns you have regarding using instructional technology now and going forward?*

All ten questions listed in these three sets were read verbatim in addition to some shorter follow-up questions improvised in the moment to probe for greater understanding or deeper connections. Following this third set of questions, I read the following statement, and then the Zoom session was ended:

*That concludes this interview/focus group session. Thank you for your time today! If you have any follow-up questions for me or would like to follow the progress of the study, you may email me at [mjurick@uoregon.edu](mailto:mjurick@uoregon.edu) and I will also put this in the chat window. I will now stop the recording and end the Zoom session. Thank you!*

The interview with Jessie lasted approximately 25 minutes, while the second session with Blake, Colby, and Daniel lasted approximately 65 minutes. Member checking was performed by sending all four participants copies of the transcripts and asking them to review the accuracy of their opinions; all participants indicated their satisfaction with the transcribed records of their participation with no requested additions, modifications, or deletions.

In compliance with the IRB protocol governing this study, all identifying information collected—including any email addresses from the survey responses and

the video and audio recordings from the interview and focus group—was securely destroyed following data collection and prior to data analysis.

### **Data Analysis**

Although incorporating both quantitative and qualitative data, this study focuses primarily on the latter. The quantitative data from the first two sections of the survey were analyzed using SPSS to obtain frequency percentages on the pre-YEDE and post-YEDE questions and compared using a simple within-subjects paired samples *t* test. The results of the analysis were used to determine differences in mindsets between the two time periods. Because the pre-YEDE and post-YEDE data were collected within the same setting, era-specific local and national news headlines were presented to the participants along with the instructions they try to place themselves into that frame of mind prior to answering the questions. Quantitative data from the non-comparative Likert-scaled questions in the third section of the survey were calculated into descriptive statistics to provide contextual insights to help inform this and future studies.

The qualitative data from the open-ended questions in the fourth section of the survey were hand-coded and analyzed to identify emergent themes in the responses. This process was completed using Microsoft Word and Excel to organize the responses into categories—a method covered in my Qualitative Design course as part of my doctoral program of study (Merriam & Tisdell, 2015, pp. 203-220). Individual responses were collected and organized by survey item, carefully read and reviewed, listed together under 8-10 codes of 1-2 words, and then, further aggregated into 3-5



overarching themes. This process was repeated for each of the four open-response items of the survey.

The 57 pages of transcribed interview and focus group text were processed using a similar method; however, unlike the survey data, interview and focus group data were analyzed at the question set-level (items 1-3 “Pre-YEDE”, items 4-6 “YEDE”, and items 7-10 “Post-YEDE”) and qualitatively coded and themed. Unrelated commentary, pause fillers, discourse particles, and minimal responses were removed, and key quotes were identified to illustrate key themes in the data.

## CHAPTER III

### RESULTS

Following the same order in which data were collected, I report the results from the survey first, followed by the results from the interview and focus group.

#### **Survey**

Results from the survey were collected from 24 participants. As mentioned previously, responses from a 25<sup>th</sup> participant were removed from the dataset post-collection during initial data validation because they were not a middle school teacher. The remaining 24 participants were verified as eligible to participate in the study, and their responses were included in the final survey dataset for analysis.

#### ***Sections 1 and 2: Comparisons Pre- and Post-YEDE***

The first two sections of the survey were comprised of five Likert-scaled items designed to solicit data on participants' mindsets from pre-YEDE (prior to March 2020) and post-YEDE (after June 2021), respectively. The third section included five Likert-scaled items intended to gather data on participants' self-reflections on how their feelings and mindsets toward technology may have changed between the two time periods. Descriptive statistics from these first three sections are provided in Table 4.

**Table 4***Survey Sections 1-3 Results: Descriptive Statistics by Survey Item*

Survey Item	<i>M</i>	<i>SD</i>
<i>Pre-YEDE</i>		
I regularly implemented technology in my lessons.	3.54	1.22
I found value in educational technology.	4.04	0.91
I found my students did better in lessons or assignments that involved technology.	3.29	0.99
I felt comfortable using technology in my lessons.	3.92	1.14
I was open to trying new things involving technology.	4.17	0.87
Average of Pre-YEDE Responses to Section 1 (possible range of 5-25)	18.96	4.37
<i>Post-YEDE</i>		
I regularly implement technology in my lessons.	3.96	1.16
I find value in educational technology.	4.04	1.08
I find my students do better in lessons or assignments that involve technology.	2.92	1.18
I feel comfortable using technology in my lessons.	4.46	0.72
I am open to trying new things involving technology.	4.21	1.06
Average of Pre-YEDE Responses to Section 2 (possible range of 5 – 25)	19.58	4.40
<i>Self-Reflection</i>		
I find that my feelings about technology integration have changed since pre-YEDE.	3.38	1.17
I prefer to use more traditional/non-technology approaches in class.	3.35	1.11
I find that my students have a higher expectation for technology use in their learning.	2.92	1.14
I feel that the nature of education has changed because of technology.	4.46	0.59
I feel I have been given adequate professional resources to effectively use technology.	3.42	0.83

*Note.* Likert scale = 1 – Strongly Disagree | 5 – Strongly Agree. *n* = 24 for all survey items.

To evaluate whether there was a statistically significant difference in teachers' thoughts about technology use in school pre- and post-YEDE, I first summed their responses to the questions on Section 1 (pre-YEDE) and Section 2 (post-YEDE) of the survey, then ran a paired samples *t*-test. Post-YEDE, teachers in my sample reported slightly more positive feelings about technology use in school ( $M = 19.58, SD = 4.40$ ) than pre-YEDE ( $M = 18.96, SD = 4.37$ ) when responses to all five questions were

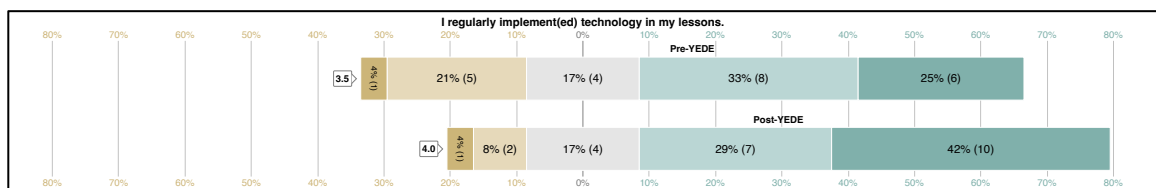
summed. The difference, however, was too small to be statistically significant,  $t(23) = 0.72, p = .48$ .

Although the difference in aggregate responses to the questions on the survey was too small to be statistically significant, some interesting trends can be seen when looking at the individual questions. Pre-YEDE, teachers in my sample reported agreeing more strongly with the statement that they found their students do better in lessons or assignments that involve technology ( $M = 3.29, SD = 1.00$ ) than teachers post-YEDE ( $M = 2.92, SD = 1.18$ ). The biggest shift in teachers' feelings about technology were related to whether they felt comfortable using technology in their lessons. While pre-YEDE, the majority of my sample indicated that they agreed with the statement ( $M = 3.92, SD = 1.14$ ), post-YEDE, the response was even more positive ( $M = 4.46, SD = 0.72$ ).

To help address the research question of whether teacher mindsets have changed, I present a side-by-side comparison of the pre- and post-YEDE responses by survey item in the figures, below.

**Figure 1**

*Plot of Responses to Questions #1 and #6*

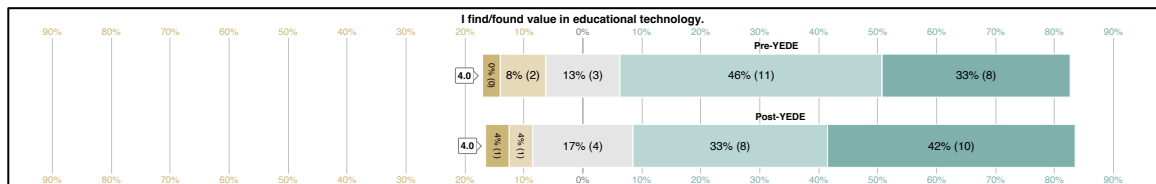


As Figure 1 shows, overall agreement of teachers in the sample to the statement *I regularly implement(ed) technology in my lessons* increased by three overall from pre-YEDE (where eight respondents [33%] *agreed* and six [25%] *strongly agreed*) to post-

YEDE (where seven [29%] *agreed* and 10 [42%] *strongly agreed*). The number of teachers—four (17%)—who neither *agreed* nor *disagreed* with the statement was the same pre-YEDE and post-YEDE. Finally, the number of teachers who overall disagreed with the statement decreased by three from pre-YEDE (where five [21%] *disagreed* and one [4%] *strongly disagreed*) to post-YEDE (where two [8%] *disagreed* and one [4%] *strongly disagreed*).

**Figure 2**

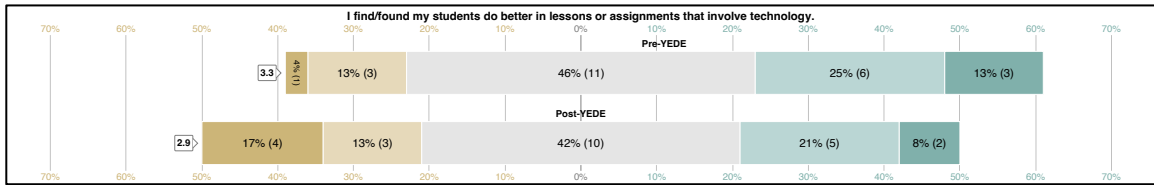
*Plot of Responses to Questions #2 and #7*



As Figure 2 shows, overall agreement of teachers in the sample to the statement *I find/found value in educational technology* increased by one overall from pre-YEDE (where 11 respondents [46%] *agreed* and eight [33%] *strongly agreed*) to post-YEDE (where eight [33%] *agreed* and 10 [42%] *strongly agreed*). The number of teachers who neither *agreed* nor *disagreed* with the statement increased by one from pre-YEDE (three [13%]) to post-YEDE (four [17%]). Finally, the number of teachers—two (8%)—who overall disagreed with the statement was the same pre-YEDE (where two [8%] *disagreed* and none [0%] *strongly disagreed*) and post-YEDE (where one [4%] *disagreed* and one [4%] *strongly disagreed*).

**Figure 3**

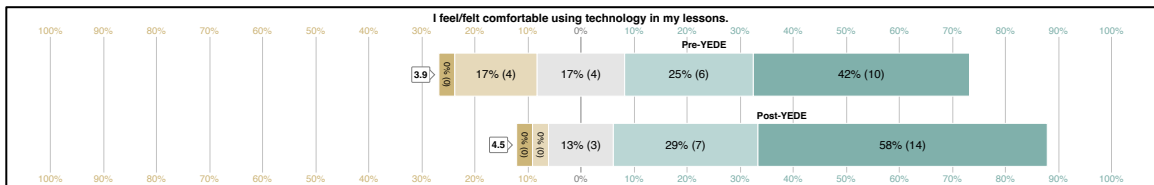
*Plot of Responses to Questions #3 and #8*



As Figure 3 shows, overall agreement of teachers in the sample to the statement *I find/found my students do better in lessons or assignments that involve technology* decreased by two from pre-YEDE (where six [25%] *agreed* and three [13%] *strongly agreed*) to post-YEDE (where five [21%] *agreed* and two [8%] *strongly agreed*). The number of teachers who neither *agreed* nor *disagreed* with the statement decreased by two from pre-YEDE (where 11 teachers [46%] selected that response) to post-YEDE (where 10 teachers [42%] indicated neutral feelings). Finally, the number of teachers who overall disagreed with the statement increased from pre-YEDE (where three [13%] *disagreed* and one [4%] *strongly disagreed*) to post-YEDE (where three [13%] *disagreed* and four [17%] *strongly disagreed*).

**Figure 4**

*Plot of Responses to Questions #4 and #9*

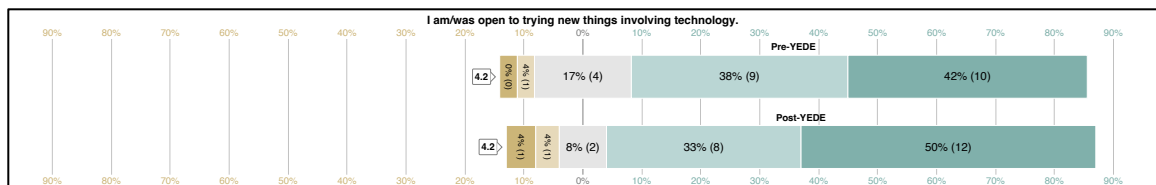


As Figure 4 shows, overall agreement of teachers in the sample to the statement *I feel/felt comfortable using technology in my lessons* increased by five overall from pre-YEDE (where six [25%] *agreed* and 10 [42%] *strongly agreed*) to post-YEDE (where seven

[29%] *agreed* and 14 [58%] *strongly agreed*). The number of teachers who neither *agreed* nor *disagreed* with the statement decreased by one from pre-YEDE (where four [17%] selected that response) to post-YEDE (where three [13%] people provided a neutral answer). Finally, the number of teachers who overall disagreed with the statement decreased by four from pre-YEDE (where four [17%] *disagreed* and none [0%] *strongly disagreed*) to post-YEDE (where none [0%] *disagreed* or [0%] *strongly disagreed*).

**Figure 5**

*Plot of Responses to Questions #5 and #10*



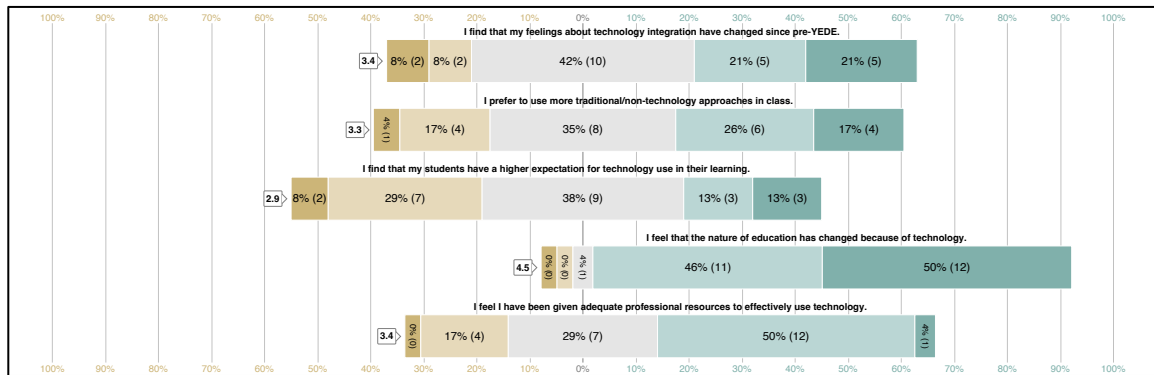
As Figure 5 shows, overall agreement of teachers in the sample to the statement *I am/was open to trying new things involving technology* increased by one overall from pre-YEDE (where nine [38%] *agreed* and 10 [42%] *strongly agreed*) to post-YEDE (where eight [33%] *agreed* and 12 [50%] *strongly agreed*). The number of teachers who neither *agreed* nor *disagreed* with the statement decreased by two from pre-YEDE (where four [17%] provided this response) to post-YEDE (where two [8%] indicated their feelings were neutral). Finally, the number of teachers who overall disagreed with the statement increased by one from pre-YEDE (where one [4%] *disagreed* and none [0%] *strongly disagreed*) to post-YEDE (where one [4%] *disagreed* and one [4%] *strongly disagreed*).

### Section 3: Present-Day Self-Reflection

In Section 3 of the survey, teachers were asked to reflect on their thoughts about whether their mindsets related to technology use in school had changed. The results to the five questions in Section 3 are depicted graphically in Figure 6.

**Figure 6**

*Plot of Responses to Questions #11-15*



For Question 11, *I find that my feelings about technology integration have changed since pre-YEDE*, two teachers in my sample (8%) indicated that they *strongly disagreed*, two (8%) *disagreed*, 10 (42%) *neither agreed nor disagreed*, five (21%) indicated that they *agreed*, and five (21%) indicated that they *strongly agreed*. In response to Question 12, *I prefer to use more traditional/non-technology approaches in class*, one teacher in my sample (4%) indicated that they *strongly disagreed*, four (17%) *disagreed*, eight (35%) *neither agreed nor disagreed*, six (26%) indicated that they *agreed*, and four (17%) indicated that they *strongly agreed*. For Question 13, *I find that my students have a higher expectation for technology use in their learning*, two teachers in my sample (8%) indicated that they *strongly disagreed*, seven (29%) *disagreed*, nine (38%) *neither agreed nor disagreed*, three (13%) indicated that they *agreed*, and three



(13%) indicated that they *strongly agreed*. In response to Question 14, *I feel that the nature of education has changed because of technology*, no teachers in my sample (0%) indicated that they *strongly disagreed*, none (0%) *disagreed*, one (4%) neither *agreed* nor *disagreed*, 11 (46%) indicated that they *agreed*, and 12 (50%) indicated that they *strongly agreed*. For Question 15, *I feel I have been given adequate professional resources to effectively use technology*, no teachers in my sample (0%) indicated that they *strongly disagreed*, four (17%) *disagreed*, seven (29%) neither *agreed* nor *disagreed*, 12 (50%) indicated that they *agreed*, and one (4%) indicated that they *strongly agreed*.

#### **Section 4: Constructed-Response**

The fourth section of the survey was comprised of four constructed-response items designed to gather a wider variety of participant responses to provide greater context for the topic and potentially generate new ideas to consider. After coding, I clustered the responses by theme (see Table 5). In response to Question 16, *What types of professional learning would best support you in implementing instructional technology in your classes/lessons*, responses generally fell into one of three themes:

- (a) Curricular Application (applying technology to lessons/curricula):
  - “How to teach students to do actual research rather than just Google and grab whatever comes up first”
  - “More ways to integrate tech in math that still have students demonstrate their understanding and show their work”

- “Keeping up with the new tech that comes out and is helpful in education”
- “Offered trainings on programs that would help me to help students who are struggling learners to access the general education curriculum”
- “I would love to learn more about iReady and all that it encompasses”
- several responses related to how to leverage AI (artificial intelligence) in their lessons

**Table 5**  
*Survey Section 4 Results: Open-Responses Coded by Survey Item*

Survey Item and Codes	<i>n</i>	%
<b>What types of professional learning would best support you in implementing instructional technology in your classes/lessons?</b>	23	-
Curricular Application	9	39.1%
Technical Training	7	30.4%
Format Preferences	7	30.4%
<b>What resources beyond professional learning do you identify as necessary to effectively implement instructional technology in your classes/lessons?</b>	26	-
Equipment/Materials	11	42.3%
Services/Subscriptions	6	23.1%
Support	5	19.2%
Time	4	15.4%
<b>Please describe any barriers or obstacles you have faced related to implementing instructional technology in your classes/lessons.</b>	26	-
Organizational Barriers	2	7.7%
Resource Deficiencies	8	30.8%
Student Behavior	9	34.6%
Technical Issues	7	26.9%
<b>Please feel free to share any other thoughts you have related to technology use in your classes/lessons and ways in which your experiences during YEDE have impacted your thoughts related to technology use.</b>	18	-
Less Technology	8	44.4%
More Technology	5	27.8%
Technical Frustrations	3	16.7%
Feature Requests	2	11.1%

(b) Technical Training (professional learning centered on teacher use of the technology itself):

- “More training on how to troubleshoot the tech we use in class”
- “I would like more instruction on using Securly, safely managing passwords, and organizing my Google Drive”
- “Translation of documents from English to other languages on a regular basis”
- “How to reset passwords, download apps on their tablets, manage security, and spy software while they are using their technology”
- “Utilizing assessments and analyzing the results of them”
- “Figuring out how to recognize AI in student writing”

(c) Format Preferences (requests related to the logistics of professional learning opportunities):

- “I do my best with technology when I can mostly explore it on my own or in a small group”
- “I'm most interested in at-your-own pace learning, I no longer want to attend Zoom sessions”
- “Whole staff or department level training specific to content areas”
- “I'd like to be able to explore apps and technology that sounds interesting without having to purchase it up front”

- “Cohorts working together to create full lessons where UDL ideas could be created”
- “I think having a link for teachers to tech PD would be nice”
- “Time to work with and develop lessons incorporating tech”

In response to Question 17 *What resources beyond professional learning do you identify as necessary to effectively implement instructional technology in your classes/lessons*, responses generally fell into one of four themes:

(a) Equipment/Materials (physical items):

- “Computer labs or carts”
- “The ability to have students print to our classroom printers when necessary”
- “Consistent wifi”
- “Supplies of headphones”
- “Smart Boards back into the classroom”
- three responses regarding 1:1 Chromebooks
- three responses regarding up-to-date and functioning equipment in general

(b) Services/Subscriptions (digital items):

- “Tools that students are unable to find workarounds for”
- “Something to have students share their work”
- “Consistent access to programs like Edpuzzle”
- “Online access to teachers and students of supportive curriculum”

- “A program to use text to speech features on assigned lessons and websites”

(c) Support (technical support and parental support):

- three responses regarding technical support when they need it
- two responses regarding parental support in reinforcing student expectations

(d) Time:

- four responses regarding the need for more time for teachers to practice and learn

In response to Question 18 *Please describe any barriers or obstacles you have faced related to implementing instructional technology in your classes/lessons*, responses generally fell into one of four themes:

(a) Organizational Barriers (relating to school/district policies):

- “District rules or regulations that limit the kinds of resources we can have available to kids”
- “The structure isn't in place around it”

(b) Resource Deficiencies (lacking time, money, or equipment):

- “A better printer for myself and my students to use in our classroom”
- “No access to charging ports or not enough chargers”
- three responses regarding time to practice and learn
- two responses regarding funding to stay up-to-date with current technology

- two responses regarding restored access to resources made available to teachers during YEDE

(c) Student Behavior (involving technology use):

- “Students vandalize the machines”
- “The use of technology seems to put many of our students into a non-thinking mindset”
- four responses regarding students not bringing Chromebooks charged and working to class
- three responses regarding students using the technology for non-learning purposes

(d) Technical Issues (issues/difficulties arising from technology malfunction):

- “It seems to take more time or students to get set up and logged in”
- “When new things don't work, backup support”
- “Getting stuck with software that sucks”
- three responses regarding Internet/Wi-Fi not working
- two responses regarding damaged/broken student devices

In response to Question 19 *Please feel free to share any other thoughts you have related to technology use in your classes/lessons and ways in which your experiences during YEDE have impacted your thoughts related to technology use*, responses generally fell into one of four themes:

(a) Less Technology (advocating for less technology use and/or diminished impressions of technology):

- “After COVID, I've been very anti-technology and it's going great”
- “I am much more careful and less willing to spend great amounts of time on technology in my classroom now”
- “My students produce stronger, more thoughtful work and are more fully engaged in their learning when I minimize the use of technology”
- “I want to make sure that students can be successful in a classroom where we use technology some days and some days we don't and they are still able to be actively engaged”
- “I have a negative visceral reaction to the idea of being on a Zoom meeting now”
- “Students seem almost saturated with technology and there is no longer any novelty”
- “It's interesting how many students post-COVID prefer paper/pencil work or at least a balanced amount whereas prior to COVID they seemed to prefer using technology for their assignments”
- “I do not feel it is necessary for middle school students to have school-provided Chromebooks to take home”

(b) More Technology (advocating for more technology use and/or improved impressions of technology):

- “I am more comfortable with certain programs as I had the ‘forced’ time during the pandemic to learn them and start to evaluate their uses”

- “I'm grateful for the accommodations and differentiation that technology gives to all students”
- “Having ready support encourages me to go-for-it when trying new things”
- “Technology is extremely beneficial to both teachers and students”
- “Everything is available digitally and I try to take in assignments digitally whenever possible”

(c) Technical Frustrations (relating to technical barriers to use):

- “The Chromebooks have become a struggle, as students often do not bring the Chromebook that has been assigned to them to school or it is not charged”
- “This year has been the hardest technology year I have ever had”
- “Implementing tech inside a gym requires different infrastructure that’s not available”

(d) Feature Requests (requests that would enhance technology use):

- “What I'd like to see happen is that we have a district-wide repository (a Google Drive, or similar, perhaps) for Universally Designed digital instructional materials so that everyone teaching a specific topic could make or modify materials and upload them for all to use when needed”
- “I would love training on creating videos for instruction”



## Interview and Focus Group

I reviewed the transcripts of the interview and focus group for qualitative codes and then categorized the codes into emergent themes per section.

### ***Pre-YEDE***

Codes and themes from interview/focus group items 1-3 covering mindsets pre-YEDE are listed in Table 6.

**Table 6**

*Focus Groups: Pre-YEDE Codes and Themes*

Codes	Themes
Daily Use	
Limited Access	Access and Infrastructure
Professional Advocacy	
Instructional Value	
Manipulatives	Pedagogical Practices
Online Curriculum	
Paper-Pencil	
Collaboration	Student-Centered Learning
Student Engagement	
Barriers	
Classroom Management	Teacher Attitudes and Adaptation
Keen Adopter	
Adaptation	
Creative Applications	Technology Integration
Google Classroom	

**Access and Infrastructure.** This theme encompasses codes related to the availability of technology, including *Daily Use*, *Limited Access*, and *Professional Advocacy*. It reflects the challenges and efforts related to ensuring sufficient technological resources for effective teaching.

**Daily Use.** Reflecting on the routine integration of technology in classrooms before YEDE, as highlighted by Blake's statement, "We used Google Classroom for just about everything. We used it daily," illustrating the regular reliance on digital tools, with platforms like Google Classroom being fundamental to daily teaching and learning activities.

**Limited Access.** Illustrating the challenges faced by educators and students due to restricted availability of technology resources before YEDE. Jessie's remark, "Obviously not Chromebooks in the classroom, because those were very limited for us," underscores the scarcity of essential digital tools, highlighting the constraints that limited the full integration of technology into daily educational practices.

**Professional Advocacy.** Capturing educators' efforts to secure consistent access to technological resources for their students. Colby's statement, "I had to advocate for it to be in the classroom on a regular basis," reflects the extra steps taken by teachers to ensure their students had the necessary tools for learning, emphasizing the importance of teacher involvement in resource allocation decisions.

**Pedagogical Practices.** Including *Instructional Value*, *Manipulatives*, *Online Curriculum*, and *Paper-Pencil*, this theme highlights the variety of teaching methods used and the balance between digital and non-digital approaches.

**Instructional Value.** Reflecting educators' discernment in choosing technology that meaningfully enhances learning. Blake's reflection, "Making sure that everything that I used before actually had value rather than, 'Oh, this is just cool,'" underscores the

need for thoughtful consideration of technology's role in education, focusing on its contribution to meaningful learning experiences over novelty.

**Manipulatives.** Highlighting the use of physical teaching aids in the classroom in absence of technological resources. Jessie's mention of, "Some manipulatives would be thrown around" in a math setting illustrates the regular use of non-technological resources in the classroom.

**Online Curriculum.** Denoting the utilization of digital content and platforms to complement or replace non-digital teaching materials. Blake's reference to, "Using the new reading curriculum with a combination of the online curriculum" exemplifies this trend, where teachers integrate web-based resources to enrich the learning experience, offering a diverse range of instructional materials accessible through technology.

**Paper-Pencil.** Capturing the continued use of non-digital learning tools amidst digital advancements. Jessie's description of classroom activities involving, "A lot of paper and pencil" alongside digital tools signifies the enduring value of non-digital tasks such as handwriting in educational settings, reflecting a balanced approach to teaching that incorporates both analog and digital methods.

**Student-Centered Learning.** By considering codes such as *Collaboration* and *Student Engagement*, this theme focuses on the impact of technology on student learning experiences, including engagement, collaboration, and accommodation for special needs.

**Collaboration.** Reflecting the use of technology to facilitate cooperative learning and interaction among students. While participants did not explicitly mention

"collaboration", the regular use of platforms such as Google Classroom, as mentioned by Blake, inherently supports collaborative activities by allowing students to work together on assignments, share ideas, and provide feedback in a shared digital space, illustrating the integration of technology to foster a collaborative learning environment.

**Student Engagement.** Pertaining to the use of technology to capture and maintain students' interest in learning activities. Although not explicitly mentioned in the focus groups, the integration of digital tools such as Google Classroom and interactive activities such as stop-motion animation, as highlighted by Daniel, suggests an effort to enhance student participation and involvement in the learning process through engaging and interactive digital content.

**Teacher Attitudes and Adaptation.** Encompassing *Barriers*, *Classroom Management*, and *Keen Adopter*, this theme reflects teachers' overall attitudes towards technology, their strategies for managing its use, and the challenges they faced in integrating it into their teaching.

**Barriers.** Encompassing the challenges educators face in integrating technology into teaching. Jessie's statement, "the limitedness that we had was one of the major barriers," along with Daniel's mention of technical issues such as devices not being charged or not working properly, highlights the practical obstacles in technology use, such as limited access to devices, technical malfunctions, and the steep learning curve associated with adopting new digital tools.

**Classroom Management.** Reflecting how technology influences the oversight and organization of student behavior and learning in the classroom. Blake's mention of

using GoGuardian, stating, “they were being held fairly accountable,” highlights the role of digital tools in maintaining discipline and ensuring students stay on task, illustrating how technology can be an asset in managing classroom dynamics and student engagement with educational content.

***Keen Adopter.*** Indicating teachers’ enthusiasm for integrating technology into their teaching practices. Blake's statement, “I was a keen adopter. I went early and I went pretty hard,” exemplifies this eagerness, showcasing a proactive stance towards embracing digital tools and platforms to enhance instructional delivery and student learning experiences.

***Technology Integration.*** This theme groups codes like *Adaptation*, *Creative Applications*, and *Google Classroom* showcasing the ways teachers incorporated technology into their classrooms, tailored to subject needs and student abilities.

***Adaptation.*** Highlighting how teachers modify and tailor technology to meet the specific needs of their students and subjects. Daniel’s use of Google Slides to “modify things for my students,” especially for those “with more disability,” exemplifies this customization, demonstrating educators’ efforts to adjust digital tools to create more inclusive and accessible learning experiences for all students.

***Creative Applications.*** Reflecting the innovative use of technology to engage students in unique and imaginative learning activities. Daniel’s experimentation with stop motion animation represents this inventive approach, showcasing how teachers leverage digital tools to transcend traditional learning boundaries and foster creativity and exploration among students.

**Google Classroom.** Capturing the widespread adoption of this platform as a central hub for managing coursework, resources, and communication between teachers and students. Blake’s mention of “using Google Classroom for just about everything” and Daniel’s integration of the platform for organizing and modifying learning materials illustrate its pivotal role in providing a useful, digital learning environment that supports both teaching and student engagement.

**YEDE**

Codes and themes from interview/focus group items 4-6 covering mindsets during YEDE are listed in Table 7.

**Table 7**

*Focus Groups: YEDE Codes and Themes*

Codes	Themes
Audio Additions	
Engagement Strategies	
Instructional Innovation	Adaptation and Innovation
Smooth Transition	
Communication Improvement	
Screen Sharing	Communication and Collaboration
Zoom Learning	
Preparedness	
Tech Efficacy	Perceived Efficacy of Technology
Access Issues	
Non-Mandatory	Student Access and Engagement
Participation Variance	
Comfort with Tech	
Google Classroom	Technological Proficiency and Challenges
Learning Curve	

**Adaptation and Innovation.** This theme includes *Audio Additions*, *Engagement Strategies*, *Instructional Innovation*, and *Smooth Transition*, reflecting how teachers adapted to remote learning and innovated with technology to keep students engaged.

**Audio Additions.** Highlighting the adaptability of educators in enhancing digital content to meet the needs of remote learning. Daniel’s initiative to “learn quickly how to add audio to my slide presentations” reflects this adaptation, where teachers augmented digital materials with audio commentary to ensure comprehension and engagement, especially for students who might struggle with reading or prefer auditory learning, showcasing a tailored approach to instruction in a fully remote context.

**Engagement Strategies.** Reflecting the creative approaches teachers adopted to maintain student interest and participation in a remote learning environment. Colby’s innovative “Cocoa and Conversations” activity, where students engaged in discussions over Zoom while enjoying cocoa, exemplifies such strategies. This approach not only fostered a sense of community and normalcy during isolation but also encouraged students to actively participate and turn on their cameras, demonstrating the importance of adapting engagement methods to the virtual classroom setting.

**Instructional Innovation.** Underscoring the novel teaching methods educators employed to adapt to the demands of remote learning. Colby’s embrace of new technologies, such as figuring out Zoom and integrating it into class activities, reflects this spirit of innovation. By exploring and applying these new digital platforms creatively, educators were able to continue delivering impactful lessons and maintain a

sense of classroom community, even in a virtual environment, highlighting the resilience and adaptability of teachers in navigating unprecedented educational challenges.

***Smooth Transition.*** Highlighting how some educators experienced a relatively seamless shift to remote learning due to their prior integration of technology in the classroom. For example, Blake mentioned, “Initially, for me, because I had been really using it fully in my classroom, it wasn't a big deal,” indicating that previous familiarity with digital tools and platforms facilitated a smoother adaptation to the sudden demands of online education. This ease of transition underscores the advantage of ongoing technology use in preparing both teachers and students for unforeseen shifts in the learning environment.

***Communication and Collaboration.*** Encompassing *Communication Improvement, Screen Sharing, and Zoom Learning*, this theme highlights how technology facilitated communication and collaboration among students and teachers during remote learning.

***Communication Improvement.*** Reflecting the ways in which technology facilitated better interaction among educators and between teachers and students in a remote learning context. For instance, Jessie noted that technology, especially platforms such as Google Drive, improved the ability to “communicate with one another” by centralizing and streamlining the sharing of instructional materials and resources. This enhancement of communication channels was crucial in maintaining the continuity of education and collaboration despite the physical separation imposed by the YEDE.



**Screen Sharing.** Capturing the use of technology to foster interactive and collaborative learning experiences in a remote setup. Daniel highlighted this by mentioning that students “really liked to screen share” during online classes, particularly enjoying “showing off their homes or stuff in their houses.” This ability to share their screens allowed students not only to present academic content, but also to share personal insights and experiences, thus enriching the virtual classroom environment and promoting a sense of community and engagement among students despite the physical distance.

**Zoom Learning.** Encapsulating the shift to video conferencing platforms as the primary medium for instruction and interaction. Participants like Daniel mentioned, “We did a lot of Zoom,” indicating the platform’s central role in facilitating classroom activities, discussions, and presentations in a remote learning context. This reliance on Zoom marked a significant adaptation in teaching methods, where educators leveraged these tools to maintain educational continuity and student engagement during a period of unprecedented disruption.

**Perceived Efficacy of Technology.** Including *Preparedness* and *Tech Efficacy* this theme reflects teachers’ perceptions that technology, despite its challenges, improved the educational situation during YEDE by enabling continued learning and communication.

**Preparedness.** Highlighting the challenges and efforts of educators in anticipating and planning for students’ learning needs in a remote environment. Jessie’s reflection on the early days of remote learning, where “we were creating all of these

packets of work and students didn't attend online learning," underscores the initial struggle to prepare adequate physical materials and strategies for effective distance education. This period of rapid adjustment required educators to develop and implement new digital instructional plans, often with little guidance or precedent, but largely able to do so due to existing familiarity with certain technological resources such as Google Classroom.

***Tech Efficacy.*** Underscoring educators' belief in the positive role of technology in mitigating the challenges posed by remote learning. For example, Blake mentioned, "I think it [technology] improved the situation because at least it gave us a starting point," highlighting the perception that technology served as a crucial lifeline in maintaining educational continuity especially at the onset. This sentiment reflects a recognition among educators that, despite its challenges, technology enabled a level of engagement and learning that would have been otherwise impossible during remote learning, underscoring the instrumental role of digital tools in navigating the circumstances of YEDE.

***Student Access and Engagement.*** This theme, including *Access Issues, Non-Mandatory, and Participation Variance* focuses on the challenges related to student access to technology and the wide range of engagement levels among students.

***Access Issues.*** Encapsulating the challenges related to ensuring all students have the necessary technology and connectivity to participate in remote learning. Colby voiced concerns about this, stating, "I do remember being concerned about access issues based on the number of students who I had that lived out [omitted rural town]

direction. And hotspot or not, it did not matter.” This highlights the significant barrier posed by digital divides, where geographical location, economic disparities, and infrastructure limitations impacted students’ ability to engage with online education, emphasizing the critical need for equitable access to technology in ensuring the effectiveness of remote learning.

***Non-Mandatory.*** Highlighting the optional nature of participation in remote learning, which influenced student engagement levels. Blake reflected on this aspect, saying, “It was very clearly made known to everyone from the start it was optional for them. We couldn’t fail them based on this.” This policy, intended to accommodate the varied and unprecedented challenges faced by students and families, led to a wide range of student participation rates and impacted the overall effectiveness of remote education, as educators grappled with maintaining educational standards while being empathetic to the unique circumstances of each student.

***Participation Variance.*** Capturing the wide range of student engagement levels in remote learning, as noted by the participants. Blake observed a significant drop in student participation, stating, “I never saw or heard from at least 50 percent of my students again” after the shift to remote learning. This variance in participation underscores the diverse challenges and circumstances faced by students during the YEDE, from access issues to motivation and beyond, highlighting the complex task educators faced in trying to maintain continuity and inclusivity in their teaching practices during the YEDE.

**Technological Proficiency and Challenges.** Grouping *Comfort with Tech*, *Google Classroom*, and *Learning Curve*, this theme addresses the varying levels of comfort and the steep learning curve associated with using new or existing technology for remote learning.

***Comfort with Tech.*** Capturing educators' varying levels of ease and familiarity with the digital tools necessitated by remote learning. For instance, Jessie shared, "I think it was pretty natural because Google and Google Drive was something I was already using in my personal life," indicating a smooth adaptation for some teachers. Conversely, others faced steeper learning curves, emphasizing the diversity in technological proficiency among educators and the impact of this variance on their ability to deliver effective remote instruction during the unprecedented shift to online education.

***Google Classroom.*** Emphasizing the platform's significant role in facilitating remote learning. Educators like Jessie mentioned, "We didn't really have Google Classroom until we went to that full-time distance learning," indicating a shift towards or increased reliance on this tool as a response to the emergency transition to online education. Google Classroom served as a crucial hub for organizing assignments, resources, and communications between teachers and students, highlighting its utility in maintaining educational continuity and structure in a virtual setting.

***Learning Curve.*** Highlighting the challenges and adjustments educators faced in mastering new technologies for remote teaching. Colby encapsulated this experience, stating, "I'm going to say a steep learning curve because I feel like I took on new things

that I didn't already know in technology...it was like, 'Oh, I got to figure this out today.'"

This comment reflects the rapid pace at which teachers were required to adopt and adapt to digital platforms and tools, underscoring the resilience and dedication of educators in navigating the complexities of remote education to continue supporting their students' learning.

### **Post-YEDE**

Codes and themes from interview/focus group items 8-10 covering mindsets post-YEDE are listed in Table 8.

**Accessibility and Inclusion.** Encompassing *Accessibility, Stigma, and Universal Design for Learning (UDL)*, this theme highlights the crucial role of technology in providing equitable access to learning for all students, including those with special needs and ELLs.

**Accessibility.** Emphasizing the ongoing efforts to ensure that educational content and technology are usable for all students, including those with diverse learning needs. Daniel's experience reflects this focus, with remarks on making learning materials accessible through technology: "With the iPads now, kids can have the iPad read to them... but there's so many paper packets... if we can get the packet in digital format, then the iPad can read it for them, and that's a help." This highlights the critical role of digital tools in breaking down barriers to learning, showcasing the importance of accessible technology in creating an inclusive educational environment in the aftermath of YEDE.

**Table 8***Focus Groups: Post-YEDE Codes and Themes*

Codes	Themes
Accessibility	
Stigma	Accessibility and Inclusion
Universal Design for Learning (UDL)	
Engagement	
Independence	Instructional Balance and Effectiveness
Tool Balance	
Language Support	
Student Well-being	Operational and Ethical Considerations
System Reliability	
Learning Curves	
Professional Learning	Professional Learning and Resource Management
Resource Availability	
Critical Thinking	
Gamification	Technological Dependency and Skills
Overdependence	

**Stigma.** Reflecting concerns about the perceptions and potential negative connotations associated with using certain technological aids or adaptations in the classroom. Daniel touched on this when discussing the challenges faced by students with disabilities or learning differences, noting, “For kids who are not comfortable letting others know that they have this disability, it’s a big hindrance.” This highlights the social barriers and reluctance some students may experience in utilizing technology designed to support their learning, emphasizing the need for fostering an educational environment where the use of assistive technologies is normalized and free from stigma.

***Universal Design for Learning (UDL).*** Signifying a shift towards creating learning experiences that are accessible and effective for all students, regardless of their learning styles or abilities. Daniel’s involvement in a course focusing on universal design principles, aiming for “something that is universal for everybody and inclusive of everybody,” underscores this commitment. This approach involves designing curriculum and using technology in ways that accommodate a wide range of learners, ensuring that educational content is inherently accessible and does not require significant modification to meet individual needs, reflecting a proactive strategy in building inclusivity into the fabric of education.

***Instructional Balance and Effectiveness.*** Grouping *Engagement, Independence,* and *Tool Balance,* this theme reflects teachers’ efforts to strike a balance between digital and non-digital teaching methods to optimize instructional effectiveness.

***Engagement.*** Highlighting educators’ ongoing efforts to captivate and maintain students’ interest in learning, particularly as they transition back to more non-digital classroom settings. The innovative strategies developed during remote learning, such as Colby’s “Cocoa and Conversations,” continue to influence approaches to student engagement. Educators like Colby, who recognized the value of unique engagement methods during remote sessions, are now applying these insights to enhance participation and interaction in the physical classroom. This reflects a blending of pre-YEDE and YEDE-era strategies to foster a dynamic and engaging learning environment that resonates with students’ evolved expectations and experiences.

**Independence.** Highlighting the emphasis on empowering students to take charge of their learning through the use of technology. Jessie’s observation that technology allows students, especially those in special education, to “access the curriculum via their Chromebook use” without needing to be pulled out of the general education classroom illustrates this shift. By providing students with the tools and resources to engage with the curriculum on their own terms, technology fosters a sense of autonomy and self-directed learning, enabling students to explore and understand content at their own pace and in their own way, thereby enhancing their overall learning experience.

**Tool Balance.** Reflecting educators’ nuanced approach to integrating technology in the classroom, emphasizing a harmonious blend between digital and non-digital teaching methods. Blake’s decision to revert to “pencil and paper” for certain activities, despite being a self-described “keen adopter” of technology, illustrates this balanced perspective. This approach acknowledges the value of both digital and non-digital educational tools, aiming to leverage the strengths of each to enhance learning outcomes and maintain student engagement without becoming overly reliant on digital solutions.

**Operational and Ethical Considerations.** Combining *Language Support*, *Student Well-being*, and *System Reliability*, this theme considers the operational reliability of technology, ethical considerations in its use, and its role in supporting diverse student needs.



**Language Support.** Underscoring the vital role of technology in assisting English Language Learners (ELLs) and students facing language barriers. Colby highlighted this importance by sharing, “For our English language learners... without instructional technology, they’d be drowning... we can use the technology, whether it be our phones, iPads, Google Translate... extremely helpful.” This perspective emphasizes how digital tools can bridge communication gaps, provide real-time translation, and facilitate a more inclusive learning environment where students of diverse linguistic backgrounds can access the curriculum and engage more fully in their education.

**Student Well-being.** Reflecting a growing awareness of the impact of technology use on students’ mental and emotional health. Blake’s concern about the broader implications of excessive screen time, suggesting that “the more children are being raised with phones in front of their faces... the fewer words they're learning,” highlights the need for a balanced approach to technology in education. This emphasizes the importance of considering not just the academic but also the well-being aspects of students’ experiences with technology, advocating for mindful integration of digital tools in ways that support holistic development and health.

**System Reliability.** Highlighting the challenges and frustrations that arise when technology, which has become integral to teaching and learning, fails to function as expected. Colby’s experience with technology downtime, “when we were down... it was like, ‘Okay, Plan B,’” underscores the dependence on digital infrastructure and the need for contingency plans. This reliance on technology for daily educational activities makes

system reliability a critical concern, emphasizing the importance of robust and dependable technological infrastructure to prevent disruptions in learning.

**Professional Learning and Resource Management.** Including *Learning Curves*, *Professional Learning*, and *Resource Availability*, this theme addresses the ongoing need for professional learning in the face of rapidly evolving educational technologies and the challenge of effectively integrating a wide range of resources.

**Learning Curves.** Capturing the ongoing journey of educators in adapting to and mastering new technologies integrated into teaching practices. While specific participant quotes addressing learning curves post-YEDE were not provided, the theme suggests that educators continue to face challenges in keeping pace with evolving digital tools and platforms. This ongoing process of learning and adaptation reflects a commitment to leveraging technology effectively for educational enhancement, despite the potential hurdles of adopting new systems and methodologies in a rapidly changing technological landscape.

**Professional Learning.** Emphasizing the importance of ongoing education and support for teachers in effectively integrating technology into their classrooms. Participants like Daniel, who mentioned engaging in online learning, highlight the value of professional learning opportunities that allow educators to explore new tools and strategies. This focus on professional learning underscores the need for structured support systems that help teachers navigate the evolving landscape of educational technology, ensuring they are equipped to harness its potential to enhance student learning outcomes.

**Resource Availability.** Highlighting the importance of ensuring that educators and students have access to the necessary technological tools and resources for effective teaching and learning. Although not explicitly mentioned in the provided quotes, the underlying theme suggests a focus on equitably distributing technology within the educational environment to bridge gaps and support diverse learning needs. This encompasses not just the hardware, like devices and connectivity, but also software, educational content, and support services, ensuring that all members of the school community are adequately equipped to engage with and benefit from digital learning opportunities.

**Technological Dependency and Skills.** This theme includes codes like *Critical Thinking*, *Gamification*, and *Overdependence*, addressing concerns about students becoming too reliant on technology and its impact on their cognitive and social skills.

**Critical Thinking.** Reflecting concerns about the impact of technology on students' ability to engage in deep, reflective thinking. Blake's observation, "I feel like our kids' brains have been broken to where they can no longer think independently," highlights a perceived decline in critical thinking skills, potentially exacerbated by overreliance on technology for quick answers. This points to a need for educational strategies that not only integrate technology but also actively promote and develop critical thinking and problem-solving skills, ensuring that students can navigate the wealth of information technology provides with discernment and insight.

**Gamification.** Touching on the use of game-like elements in education to boost student engagement and motivation. However, it also reflects concerns about the

potential downsides, such as diminished attention spans for non-gamified tasks. Blake's comment, "A lot of my students are to the point where their expectation is that we're making everything fun for them... their stamina for doing things that they don't consider fun now has gone way, way down," illustrates the challenge. This highlights the need for a balanced approach that leverages the engaging aspects of gamification while ensuring it supports deep learning and maintains students' ability to engage with more non-digital, less interactive forms of learning.

***Overdependence.*** Reflecting concerns about students becoming excessively reliant on technology for learning and problem-solving. Blake's observation that students would "literally type into Google, how many minutes until 2:30 [school dismissal]" or "what is 2 plus 2" highlights a shift towards using technology as a crutch, rather than a tool for enhancing learning. This points to the need for educating students on the appropriate and effective use of technology, ensuring they develop the critical thinking and problem-solving skills necessary to function both with and without digital aids.

## CHAPTER IV

### DISCUSSION

In analyzing the qualitative themes across the various times spanning pre-YEDE through present, a general narrative emerges detailing the evolution of technology mindsets from inquisitive, to focused, to now critical. Direct quotes from participants provide a fairly clear illustration of this narrative.

Pre-YEDE, teachers were in various stages of adopting technology, with some enthusiastically integrating digital tools such as Google Classroom and others still finding their footing. There was a sense of experimentation and exploration in using technology to enhance teaching and learning, but no urgency to do so. There were concerns about the limitations of the availability of technology, which led teachers to focus on how to effectively integrate the limited amount of technology accessible to them into their lessons, balancing non-digital methods with digital tools to enhance student learning. As Jessie shared, “Obviously not Chromebooks in the classroom, because those were very limited for us. So, it was a lot of paper and pencil.”

Pre-YEDE, enthusiasm regarding technology use was relatively high, as was the optimism in viewing technology as the potential next-best-thing in education. As Blake stated, “I was a keen adopter. I went early and I went pretty hard advocating for a set in every classroom, using it for almost every assignment, really thinking that I could have a paperless classroom. And that was working at the time, so I kind of went all in on it.” This echoes the sentiments of the State of Maine’s 1:1 task force (State of Maine, 2001): “Technology can empower more teachers and students to do what our best teachers

have been striving to do already: reach each student with powerful, personal learning opportunities. The goal of the technology endowment is to make learning more dynamic, engaging, and personalized – and extend learning well beyond the school walls” (p. 11).

During the YEDE, the sudden shift to remote learning necessitated a rapid scale-up of technology use, pushing teachers to adapt quickly to tools like Zoom and Google Classroom, regardless of their previous comfort levels with technology. For some it was easier than it was for others. As Blake reflected, “Initially, for me, because I had been really using it fully in my classroom, it wasn't a big deal, provided the students had access.” Yet despite the emergency nature of the situation, teachers did not shy away from or openly resent the technology; instead they employed creative strategies to engage students remotely. “I actually enjoyed figuring out Zoom,” Colby admitted, “And I had some class activities that we figured out how to continue over Zoom, like Cocoa and Conversations,” highlighting an innovative shift in how technology was used to maintain and foster learning engagement during remote sessions. The YEDE brought to light significant challenges, not all of which were technology-specific. Jessie shared, “Those first few months? I felt school was kind of a joke... I don't think kids were actually accessing it. They weren't actually doing or learning during that time.” Frustration handling disparities in student access to technology, issues with student engagement, and the difficulties of maintaining educational rigor in a remote environment was a common experience.

Finally now, several years out from the YEDE, teachers have become more critically reflective of the role of technology in education, recognizing both its potential benefits and its limitations or negative impacts, especially concerning student dependency on technology and the erosion of critical thinking skills. Blake shared, “I hate it. I feel like our kids’ brains have been broken... They have literally stopped having their first step of thinking being in their brain. They’ve become so dependent on ‘I can Google the answer’”. There’s a clear shift towards seeking a balanced approach to technology use, where digital tools are employed judiciously to enhance learning without overshadowing non-digital, fundamental educational values and practices. Colby reflected, “I think there’s a fine balance... I appreciate the ability to access things that I could not access without it... But, for example, when we do writing assignments, we do pre-writings on paper.”

Quite beneficially, teachers have gained a deeper understanding of the importance—and wide-ranging capabilities—of using technology to make learning more accessible and inclusive for all students, particularly those with special needs and English language learners. Daniel said, “During that year, I taught fully online... students had access to the ReadWrite program, and it’s amazing and wonderful and helpful... But there’s so many paper packets. And the minute you give a paper packet to a student who can’t read, you’ve eliminated their ability to access it.” As teachers become more aware of the promises of technology, they similarly become more aware of gaps in their own understanding of how it works and how it can be effectively integrated, bolstering a growing need for ongoing professional learning opportunities.

In response to the research question, *Has the year of emergency distance education (YEDE) impacted teacher mindsets regarding implementing instructional technology?*, I identified five key findings through analysis of the survey and focus group responses. Although this study had a relatively small sample size—a point to address in future expansions of this work—the insights generated provide a clear perspective on the part of middle school teachers regarding instructional technology before, during, and after the YEDE. The findings reveal a general trend toward greater acceptance and integration of technology, tempered by a critical awareness of the challenges, and a commitment to balancing digital and non-digital pedagogical approaches. This understanding provides a foundation for future initiatives aimed at enhancing the effective implementation of instructional technology.

### **Mindsets Overall have Shifted to More Positive**

The YEDE has caused a positive shift in teachers' mindsets toward instructional technology. The results comparing pre- and post-YEDE sentiments from the survey show that participants more strongly agreed with four of the five technology use statements post-YEDE than pre-YEDE—with the most dramatic increases seen in the first item, *I regularly implement(ed) technology in my lessons* and second item, *I find/found value in educational technology*, which saw 17% and 13% increases in *Strongly Agree*, respectively. In their adoption and integration of technology, teachers have increasingly recognized its value in enhancing teaching and learning processes. This shift is evident in their narratives about adopting new digital tools, exploring online platforms, and integrating multimedia resources into their lesson plans even well after returning to in-



person instruction post-YEDE, reflecting a broadened perspective on the role of technology in education.

### **Technology is Used to Adapt and Innovate Instruction**

Teachers' experiences during the YEDE underscored their adaptability and innovation. Faced with the sudden transition to remote teaching, they developed new strategies, experimented with digital platforms, and overcame numerous challenges. This period of intense adaptation has led to a more ingrained acceptance and incorporation of technology in their teaching practices even now, signifying a profound impact on their mindsets.

### **Teachers Acknowledge the Wide Range of Challenges**

Although the YEDE has fostered a more technology-inclusive mindset among teachers, it has also highlighted significant challenges, such as student engagement, technology access and equity, and the need for professional learning. Teachers' reflections on these challenges indicate an understanding of the complexities involved in implementing instructional technology, suggesting a matured mindset that recognizes both the potential and the limitations of digital tools in education.

### **Technology is Being Used to Address More Accessibility and Equity Gaps**

One of the most notable impacts of the YEDE on teacher mindsets has been the increased focus on using technology to enhance accessibility and equity in education. Teachers have become more attuned to the needs of diverse learners, including students with disabilities and English language learners, and have leveraged technology to support their inclusion and success.

## **Pedagogical Perspectives Have Evolved**

The YEDE has prompted teachers to reevaluate their pedagogical approaches, leading to an evolving perspective that advocates for a balanced integration of technology. This balance involves combining the best of digital and non-digital teaching methods to optimize student learning experiences and outcomes, reflecting a sophisticated shift in mindset toward a more holistic view of technology's role in education.

There were a few surprises in the results, where some items exceeded expectations such as *I feel that the nature of education has changed because of technology*, which garnered 46% *Agree* and 50% *Strongly Agree*. Other results were not expected. Given the increase in teacher use of technology post-YEDE (up 13% according to results on survey items 1 and 6), I anticipated that teachers would report students having a higher expectation for technology use in their learning post-YEDE than pre-YEDE, however 29% of participants *Disagreed* and 8% *Strongly Disagreed* with that premise. Additionally, coded results from the focus groups regarding teacher requests for additional professional learning did not quite match responses to the survey item, *I feel I have been given adequate professional resources to effectively use technology*, to which 50% *Agreed* and 4% *Strongly Agreed*.

In summary, the study addressed the research question by documenting the ways—obvious and less-so—in which the YEDE influenced teacher mindsets regarding instructional technology. It has revealed both positive shifts towards greater integration

and growing concerns that need to be addressed, providing a rich foundation for understanding the complex dynamics at play in the post-YEDE educational landscape.

### **Limitations**

The study is not without its limitations, one of the most important of which is small sample size. Of the 65 middle school teachers in this district, only 24—or roughly 37%—participated in the survey and only 4—or roughly 6%—participated in either the interview or focus group. Although their input was insightful and helped establish a foundation for future research, the experiences and attitudes of four middle school teachers may not capture the full range of perspectives within a larger teacher population.

This study focused on middle school teachers; however, elementary and high school teachers may present varying perspectives on the topic of instructional technology and the YEDE. Future studies of a larger scale may benefit from including participants across a wider range of teaching disciplines and grade levels to avoid limiting the comprehensiveness of the insights.

Due to last-minute attrition among interview/focus group participants, the resulting two sessions had one and three participants, respectively. This drop in numbers created a one-on-one interview format for the first and a truer focus group setting for the second. Comparing the transcript lengths between the two, more talking points were generated in the second session than the first, with many participants starting their comments along the lines of, “I’d like to build off that...” For future

expansions of this study, I see a greater benefit in the focus group format than the interview and would recommend prioritizing that outcome.

Lastly, in thinking ahead for future expansions, a consideration should be made regarding change over time. Teachers' attitudes and experiences with technology may continue to evolve, especially as new challenges and innovations emerge, and although this study aims to capture those attitudes against the backdrop of a specific snapshot in time, ongoing changes in educational technology landscapes may make studying this time period more challenging as time goes by.

### **Reliability**

The dynamic nature of interviews and focus groups, combined with my direct involvement, had the potential to affect data collection. My positionality as both the principal investigator of this study and the district technology director had the potential of affecting the study in two key ways: participants' decision to participate and the openness of their responses to the items. Explicit care was taken to continuously assure participants their responses would remain confidential and that nothing shared would be held against them or otherwise impact their positions with the district. Regarding the first claim of participation agreement, my positionality may have positively affected the study's participation rate, as one participant stated, "[It's] why I very much wanted to be on your team or be a subject for you." Regarding the second claim of participation honesty, I am reasonably confident that the responses of the participants were honest and complete and that my positionality did not have a chilling effect, based on the

critical honesty of several of the responses, with one participant responding to the prompt of how they view technology now being, “I hate it.”

Meticulous attention to organization has been made from the beginning of the study. After securely destroying all identifying information from the collected data, every record of the study has been carefully organized and filed for easy reference including all communications, raw and analyzed datasets, and working materials and documents. Should there be any future expansions of this study—or attempts to recreate it—there is a sufficient audit trail available.

The use of scripts was employed during the interview and focus group to ensure the participants in both sessions were read the same prompts, and all reasonable attempts were made during the sessions to stick to the scripts with minimal deviations, except for rare occasions to prompt for clarification.

### **Validity**

Due to its minimal scope and scale, I believe this study to be well insulated against many threats to internal validity. However, no study is completely immune to these concerns, and so for this study I took certain steps to mitigate two potential threats I identified early on: history and attrition.

The historical event in particular that had potential for impacting the study is the budget crisis affecting the district at the time of the study. The potential effect of this event on the data collected for the study was hypothesized that potential participants might have a sense of anxiety and/or frustration regarding “more important things,” thereby placing a diminished importance on less-critical work-related tasks such as

completing the survey for this study. As for the attrition threat, it was possible that staff who completed the survey and indicated an interest in participating in the follow-up interview and focus group may have been affected by external factors (such as being too busy, etc.) that would have removed them from that follow-up sample.

To mitigate these threats, the survey was designed to be as brief as possible and was pre-introduced by building administrators and technology personnel, with the belief that hearing about the survey from colleagues who were encouraging its completion would serve to override impressions that completing a survey about technology use was not as important as other things. Additionally, the survey and follow-up interview and focus group were scheduled as closely together as possible. In spite of these mitigation attempts, the sample size for the survey was small, and the attrition between those who indicated interest in participating in the interview and focus group and those who actually joined a Zoom session to participate was high (69%).

Lastly, member checking was used to validate participants' responses to the interview and focus group. Following the anonymizing, transcription, and verification of the sessions, the transcribed texts were sent to each of the four participants via email, and they were asked to review the record of their responses to the prompts. They were invited to request any modifications—including additions or deletions—and were told that the purpose of the member checking process was to help ensure their responses accurately reflected their thoughts and opinions on the topics. Although they were given a week to perform this task, all four responded within 24 hours, stating they approved the transcript of their participation as-recorded with no modifications.

Still, some threats to validity may remain. To address these concerns, future research should include a larger and more diverse sample of teachers, employ more mixed-methods approaches to triangulate findings, and schedule the study for a time of year more conducive to teacher schedules. Longitudinal studies could also provide more insight into how teachers' attitudes and practices evolve over time in response to ongoing changes in educational technology.

The year of emergency distance education not only had a notable effect on the mindsets of teachers regarding instructional technology, but according to those same teachers it similarly had a notable effect on the mindsets of their students. Emergent themes of overreliance and hyper fixation on the part of students regarding digital technology help illustrate some of the challenges educators face, whether altogether novel or novel just in degree. Hypothesized recommendations such as increased professional learning opportunities and resource allocation were supported by the results and some additional topics such as seeking a healthy balance of use and equitable application of technology have emerged, as well. Summarily, the following list of recommendations details areas for school and district leadership to consider prioritizing to effectively support instructional technology in this post-YEDE period.

### **Recommendations**

In analyzing the key themes from the data, I have distilled teacher sentiments into five key recommendations that I as a district technology leader feel are helpful in charting my district's digital course ahead.

### ***Professional Learning and Support***

Overwhelmingly, teachers have asked for more professional learning opportunities to become more familiar not just with the technological tools provided to them, but also with the technological tools that exist “out there” that might be of benefit in their specific corners of the curriculum. A recurring theme emerged of distinguishing between helpful technology and the “bells and whistles”. As Blake put it, “I like to teach myself, but I love to have ‘Here's what's available out there,’ so that I can investigate and decide whether it's worth my time learning and how well it will serve me. The barrier is finding things that work better than what I currently do, because if you've been teaching long enough, you're like, ‘Well, I know this is going to work if I do it this way, and I don't know that that's going to be better’ so it comes down to weighing the cost of investing my time with what the expected outcome is going to be.” This recommendation aligns well with one identified in designing the MLTI.

The State of Maine Task Force identified professional learning early on as a key factor in determining the 1:1 program’s success (State of Maine, 2021): “Without a significant commitment to teacher support, the initiative will fall significantly short of our ambitious goals. Intensive, out-of-class training experiences for teachers are ineffective if access to technology in the classroom does not exist for teachers to apply, explore, and experiment with the new technology while working with students. The focus of teacher development must change from teaching teachers about technology, to helping teachers to integrate, to improve their teaching by using technology as a tool.”

(p. 14)



The issue, according to the teachers surveyed, is not a lack of interest but rather a lack of time: “I think time is our biggest barrier right now in that there is just not enough time to learn all that we need to learn or do all we need to do,” Colby explained. And even when teachers are given examples of technology integration models, the process to incorporate it can still be overwhelming: “There's the time. It takes a lot of time to really learn. I got a book this week; it's this thick and on every page is a piece of technology that can help and how it would help. So, it's kind of mind blowing to say, ‘Okay, you know, I'm going to give it a shot,’ but that's a lot,” Daniel shared.

In moving forward, schools and districts can and should provide professional learning opportunities to teachers around technology use; however, such opportunities should be vetted and narrowed down. Maine’s “just-in-time” model of professional learning, providing teachers very specific, clearly integrated and curricular-aligned technology-based lessons can be far more beneficial in promoting teacher adoption of technology than what Colby called, “a smorgasbord” of technologies they were presented with.

Teachers should not be simply handed a laptop and told to learn it, and as Gonzales (2021) points out, administrators bear a responsibility to be involved: “School administrators and teachers must become learning partners in developing new pedagogical strategies that mirror our contemporary needs.” Most importantly, teachers need dedicated time even when given pared-down resources—which inevitably means something else has to be taken off the schedule. In short, for

technology adoption to be successful, teachers need time to learn and districts need to make that learning a priority.

### ***Balanced Technology Integration***

Balanced technology integration within the educational sphere necessitates a thoughtful approach that effectively integrates digital and non-digital teaching methods. This equilibrium ensures that technology serves as a complement to pedagogy, enriching the learning experience without fostering overdependence. Blake reflected this sentiment, stating, "We've gone back to pencil and paper," underscoring a deliberate shift towards foundational learning practices amidst a tech-saturated landscape. The pursuit of innovative pedagogy—marrying technology with active learning techniques—aligns with the aspirations to cultivate an environment where critical thinking and problem-solving are at the forefront, as evidenced by Daniel's venture into "experimenting with things like stop-motion animation," showcasing a creative integration of technology within the curriculum.

The call for a balanced approach to technology integration resonates with historical debates on the place of technology in education, stretching back to the typewriter discussions of the 1920s-30s (Cothran & Mason, 1978). The desire for frameworks that guide the judicious use of technology mirrors the cautionary tales of early technology adoption in schools, emphasizing the need for thoughtful integration that preserves the essence of non-digital teaching methods. Integrating balanced technology use into the educational fabric aligns with the evolving narrative surrounding technology in education. The gradual ascendancy of technology in classrooms,

underscored by Ross (2020), reflects a landscape where digital tools have become intertwined with pedagogical practices: “Technology use in K-12 classrooms will only increase in future years as more diverse and sophisticated ed-tech products become available and students and teachers continue to become more dependent on technology applications in their everyday lives” (p. 15).

Schools and districts should not place all their faith in technology-centric solutions alone; nor should they seek to avoid technology in preference of non-digital methods where its application can meaningfully enhance the learning. Successful technology implementation, as identified by prior literature and the data from the current study, is a balanced approach of using technology when it’s appropriate/beneficial and setting it aside when it’s not. This deliberate refocusing of technology-as-a-tool status may help teachers and students alike find greater value in using technology in the classrooms.

### ***Infrastructure and Resource Management***

Addressing the infrastructure and equitable access to resources, the necessity for a robust technological foundation is paramount. Regular assessments and enhancements of the district's infrastructure are critical in ensuring that the technology employed is reliable and effective. This approach is complemented by a strategic allocation of resources that prioritizes equity, ensuring that every student, irrespective of their background, has access to the necessary tools for their education. The dialogue among participants highlighted the diverse needs across different contexts, from

leveraging Chromebooks and iPad minis to provide reinforcement activities to pushing the limits of Google Slides to make ELA lessons more accessible to varied learners.

Providing the technology is not a silver bullet, however. Although participants feel that, largely, technology devices in the form of Chromebooks and iPads have equitably been provided to all students, some areas such as internet access have failed to live up to this standard. Colby shared, “I do remember being concerned about access issues based on the number of students who I had that lived out [omitted rural town] direction. And hotspot or not, it did not matter.” Schools and districts can go a long way to providing means and access to technology, but their reach is not absolute and equity disparities remain.

Lastly, technology needs to be supported. Participants referenced—in varying levels of levity-tinged frustration—shared difficulties around technical issues such as broken devices, uncharged devices, and network outages. Colby recounted, “Matt, the other thing I wanted to mention as far as my current feelings and attitudes towards instructional technology: When it doesn't work, I have to remember to breathe! I'm used to constant, instant access. Was it last Monday when we were down? I don't remember when it was. We were all down, it was like, ‘Okay, Plan B’, and usually we're generally ready for that. Oh, I had to revamp in ways I was not ready for.”

Many districts made the plunge into 1:1 during YEDE and were able to do so given the unprecedented funding surge from state and federal governments for this very purpose. The question many now face is how to continue supporting these programs now that those one-time relief funds are no longer pouring in. Supporting a

1:1 program goes beyond just the student devices themselves; it also encompasses the schools' network infrastructure, the suite of services and software teachers and students use, and the safety precautions such as enhanced filtering services and network firewalls to protect student use of the internet. As Edelberg (2019) succinctly explained, "It bears repeating that school district superintendents face multiple, shifting priorities, for which decisions about technology integration are one among many; however, their decisions are not peripheral. The complexities involved with technology integration suggest that one does not simply install a computer tablet device in a classroom and expect magic to happen" (p. 15).

Although each school and district is in a different financial situation, my recommendation remains the same: For a technology program to be successful, it has to be adequately supported and maintained.

### ***Accessibility and Inclusion***

The commitment to accessibility and inclusion further amplifies the importance of providing tools and training that cater to a wide array of learning needs. The emphasis on Universal Design for Learning (UDL) principles was mirrored in participants' strategies for making content accessible, such as Daniel's use of "Google slides a lot to modify things for my students," which enabled personalized learning experiences for students with unique needs, and Colby's approach to variability in the general education classroom: "I had students who were getting behind... I said, 'Would you like to just start typing?' The answer was yes. I said, go for it. Speech to text and text to speech... we use both for essays and things. I'm finally getting students to use that who were refusing."

The evolution of the district's technology plan must be dynamic, responsive to the shifting landscapes of education, technology, and student needs, fostering an environment where feedback and adaptation guide the integration of technology in education.

A common talking point during the early stages of Maine's 1:1 program, referencing the SAMR (Substitute-Augment-Modify-Redefine) model of technology integration, was essentially *"What can technology allow our students to do that they could not do without it?"* It was well known early on amongst educational technologists that the true value of educational technology would be realized in those examples where technology enabled students to go where they had not gone before. Arguably, this same mindset is all the more prescient today as we try to distinguish between the meaningful and the "shiny" technologies at our fingertips, but such is not always readily obvious to even the most knowledgeable educators. As Shaheen (2019) points out, "In order for technology accessibility to be implemented, stakeholders must certainly be aware of accessibility, but they must also have deeper knowledge of accessibility (e.g., how to determine if a technology is accessible, how to remediate barriers). The literature indicated that the K–12 stakeholders who had basic awareness about technology accessibility often lacked the requisite deeper knowledge to carry out accessibility work" (p. 11).

Schools and districts should work with their teachers to find the deeply impactful intersections of technology and learning that empower their varied learners to succeed. Making accessibility features such as speech-to-text and text-to-speech universally

available and well-known helps destigmatize students' conceptions of needing special supports. More broadly, democratizing technology was an early goal of 1:1 programs—perhaps now the goal should be democratizing technology's accessibility and inclusivity.

### ***Digital Citizenship and Well-being***

In the realm of digital citizenship and student well-being, the imperative to integrate responsible technology use into the foundation of modern education was echoed by participants' experiences. The emphasis on digital citizenship aims to cultivate an understanding of ethical technology use among students, a sentiment reflected in discussions around the responsible deployment of digital tools in educational settings. Additionally, acknowledging the potential for technology fatigue, the focus shifts towards promoting well-being, with some educators observing the impact of excessive screen time on students, advocating for a balanced approach to technology use that considers the holistic well-being of the educational community.

A renewed emphasis on promoting digital citizenship is critical, as evidenced by the experiences and observations shared by the participants in this study. Their responses highlight the complex interplay between technology use, ethical considerations, and the need for responsible digital behavior, underscoring the importance of integrating digital citizenship into educational curricula.

Blake noted the challenges and opportunities presented by the increased reliance on technology during YEDE, stating, "I think my unscientific belief as I've taught for a lot of years is that the more children are being raised with phones in front of their faces instead of actual human interaction, the fewer words they're learning." This

observation points to the broader implications of technology on student development and the critical need for digital citizenship education to address these issues. Colby's experience with students attempting to circumvent educational platforms for personal use during class time further emphasizes this point. They shared, "I had a student a month ago get a zero on assessment because she was Googling the answers." This example illustrates the practical challenges teachers face in maintaining academic integrity and the need for explicit instruction in digital ethics and behavior.

Moreover, the discussion around the gamification of learning and its impact on student engagement and expectations reveals additional layers to the digital citizenship conversation. Blake remarked, "A lot of my students are to the point where their expectation is that we're making everything fun for them... And their stamina for doing things that they don't consider fun now has gone way, way down." This comment underscores the need for digital citizenship education to also cover the responsible consumption of digital content and the development of healthy digital habits.

In response to the evolving challenges of a post-YEDE educational landscape, schools and districts should revitalize their commitment to digital citizenship by weaving its principles across the curriculum, ensuring students encounter these vital concepts in various contexts. Simultaneously, investing in professional learning for educators is crucial, arming them with the tools needed to navigate and impart the nuances of digital ethics effectively. Engaging parents in the dialogue extends the conversation beyond classroom walls, fostering a unified approach to digital responsibility that resonates at home. Empowering students to lead by example, through initiatives like peer



mentoring, cultivates a culture of accountability and mutual respect online. Lastly, grounding digital citizenship lessons in real-life scenarios can significantly enhance their relevance and effectiveness, making the abstract principles of digital conduct tangible and immediately applicable for students. This multifaceted strategy aims to equip students with the discernment and integrity necessary to navigate the digital domain responsibly.

By adopting some or all of these strategic areas, school and district leaders can adjust the resources for and implementation of instructional technology programs which support and empower teachers, address equity challenges, and pave the way for future innovations in student learning outcomes.

In following through on an early promise made to the participants of this study, the key findings and recommendations will be shared with their district's leadership team, technology staff, and district technology committee to start a dialogue around the future of technology integration. The full study will be made available to all participants and any other requesting district staff.

### **Future Implications**

The results from this study, while only painting a small part of a much larger picture, have shown that the conversation around instructional technology is much larger than the effects on it caused by the YEDE, and additional studies are warranted. A few key considerations may lay the foundation for such future investigations.

### ***Novelty Has Worn Off***

The integration of technology in education has evolved from a novel addition to an essential—even expected—component of the curriculum, significantly altering the landscape of teaching and learning. Students today are born into a digital world, making technology not just a tool but an integral part of their everyday lives. This familiarity has led to a diminished sense of novelty once very strongly felt with regard to using technological tools in education that previous generations experienced, leading to a new complex set of challenges.

The exponential proliferation of digital technology equipment and services which has seemingly transcended traditional equity barriers—in particular socio-economic—means that its presence in the classroom is often taken for granted by students, diminishing the initial excitement and engagement that new tools and platforms once elicited. This normalization has led to a shift in classroom dynamics, where the introduction of new technological tools does not automatically command students' attention or respect. Consequently, educators face more significant discipline challenges as the distractions offered by technology can lead to disengagement and disruptive behavior. Smartphones, tablets, and laptops, while invaluable for their educational potential, also serve as gateways to social media and entertainment, tempting students away from the classroom structure.

Furthermore, the pervasive use of technology has escalated expectations among both students and educators. There is an assumption that every educational experience should be enhanced with the latest technological advancements, putting pressure on

schools to continually update their resources and on teachers to incorporate these tools effectively into their lesson plans. This expectation can lead to frustration and disappointment when technology fails to meet these high standards or when there is a lack of resources to support the latest educational technology trends.

Hyper fixation on technology also emerges as a notable consequence, with students and educators alike becoming overly reliant on digital solutions. This reliance can overshadow non-digital learning methods and critical thinking skills, pushing educators to find a balance between technology use and other pedagogical strategies. The challenge lies in leveraging technology to enhance learning outcomes without letting it dominate the educational experience. In addressing these issues, educators are tasked not only with keeping pace with technological advancements but also with fostering an environment that encourages responsible use of technology, maintains student engagement, and supports diverse learning methods. The key may lie in blending non-digital teaching methods with technological enhancements, promoting digital literacy alongside critical thinking, and setting clear guidelines for technology use within the classroom to mitigate discipline issues and ensure technology serves as a bridge to learning rather than a barrier.

### ***Reimagining 1:1***

Traditional 1:1 technology programs were groundbreaking in their time and for several decades commanded the spotlight as the pinnacle of modern instructional technology. They democratized access to technology by ensuring that every student, regardless of background or ability, had the tools necessary for modern digital learning.

These programs helped bridge significant gaps in technology access at a time when such devices were not as affordable, and thus not as ubiquitous in students' homes or pockets, as they are today.

However, the landscape of technology access and utilization has dramatically transformed over the past decade. Many students now grow up in environments rich with digital devices, from smartphones to tablets and personal computers, making the traditional 1:1 device distribution model less impactful. The saturation of technology in students' everyday lives means that the addition of a school-provided device may no longer represent a significant value addition to their educational toolkit. Instead, it could contribute to device redundancy, leading to issues like device management challenges, increased screen time, and distraction, rather than enhancing educational outcomes.

In light of these changes, schools and districts may be finding themselves at a crossroads, prompting a reevaluation of the foundational goals and methods—and ultimately, educational value—of 1:1 technology programs. The next iteration of these initiatives needs to move beyond mere device provision to a more holistic integration of technology that aligns with contemporary educational needs and the realities of students' tech-saturated lives. This could mean shifting focus from hardware to software solutions, digital literacy, and critical thinking skills that leverage technology for problem-solving, collaboration, and creativity.

Innovative models might include “bring your own device” (BYOD) policies supplemented with robust digital resources accessible from any device, ensuring equitable access without adding to the device glut. Such a change might also address

several downstream issues such as poor student treatment of their school-issued equipment and behavior tug-of-wars involving student cell phones. Schools and districts could invest in high-quality, collaborative software platforms that support hybrid learning environments, adapt to individual learning styles, and facilitate real-world problem-solving. Moreover, professional development for teachers in these new tools and methodologies becomes even more crucial, ensuring they can integrate technology meaningfully into their curricula.

The objective should be to foster an environment where technology is seamlessly integrated into the learning process, enhancing educational experiences without overwhelming students with redundant devices. By reimagining the 1:1 model, schools can pave the way for a more sustainable, impactful, and innovative use of technology in education, ensuring it serves to amplify learning and prepare students for a future where digital fluency is paramount. For decades, the universal first goal of 1:1 was providing access.

With that goal largely and sufficiently achieved, perhaps it's as complex and simple as asking ourselves—as our teachers did upon their return from the YEDE—“*Now what?*”

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