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An Equitable Technology Infrastructure Model: Sustained Technology Practices Implemented During COVID-19 That Address Educational Inequities

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2020 STUDY ABSTRACT

The COVID-19 pandemic illuminated the digital divide revealing an expanse of inequity among students who had access to the internet, personal devices, and parental support during remote learning and those who did not. Framed with the theoretical lens of equity literacy, this poster details the results of a survey completed by 56 Minnesota district level technology directors. The survey asked how school districts were addressing the technology inequities experienced by students and families while in hybrid and distance learning models. Results reflected that districts' efforts to provide students technology devices were efficient and successful. Recommendations for further research include advocacy for the expansion of broadband service, the pandemic's impact on the mental health of students, and efforts to sustain access to technology for all learners after the COVID-19 pandemic concludes.

2020 STUDY METHODOLOGY

Technology directors serving traditional public schools, public charter schools, and cooperatives were emailed a 10-question survey asking them to identify barriers that inhibited equitable learning experiences and share how their districts responded to the challenges that impacted student learning. Technology director contact information was acquired from the Minnesota Department of Education.

The survey was distributed to approximately 505 district technology directors. Fifty-six district level technology directors completed the survey, which reflected an 11% response rate. Likert scale responses were analyzed, and descriptive statistics were displayed in pie chart format. Open-ended responses were analyzed and organized by theme.

2020 STUDY RESULTS

Concerns Regarding Parental Support and Technology Competency

Significant Concern 7%
Not a Concern 9%
Minimal Concern 45%
Moderate Concern 39%
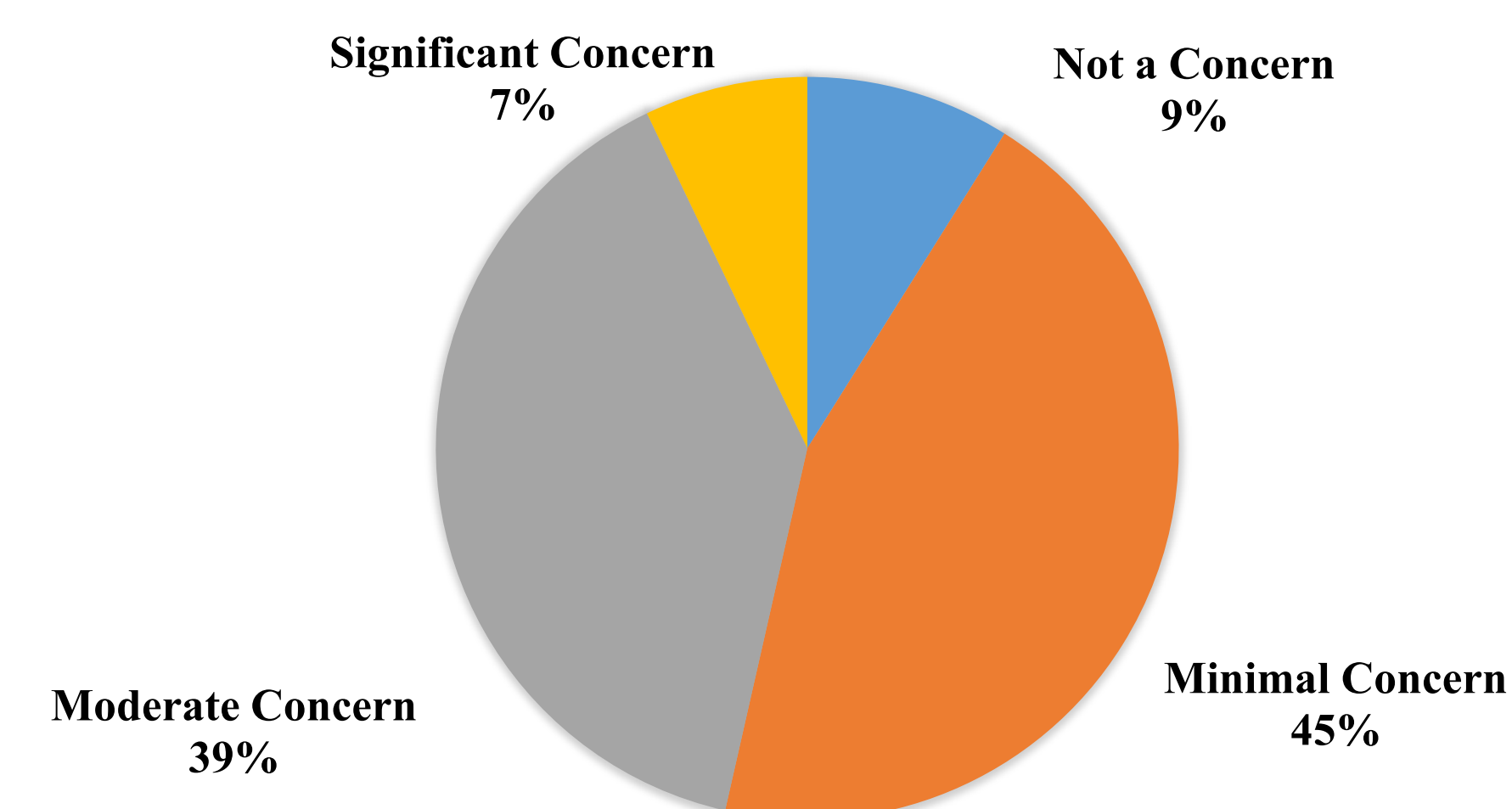
Districts created a physical help desk, a support phone line, and an online portal to provide students and families with technology assistance. Virtual office hours were conducted, and personalized Zoom, Google Meets, and phone calls were offered and extended beyond the school day to help with homework in the evening. Advisors met with students to develop success plans and students were given additional support if needed through the formation of small groups and paraprofessional assistance. Synchronous online learning was offered to students in real time to encourage engagement. When needed, students were offered the opportunity to come to school in-person to work on their homework.

Districts distributed a variety of media, including *how to* documents, short videos, and online resources. Instructions were made available in multiple languages in order to be accessible for everyone in the community. Districts limited the number of apps and platforms teachers used to help alleviate "parent paralysis." Districts organized technology information sessions and invited families to the school campus, met with families individually to provide assistance, and made home visits. New staff members were hired to bridge family-technology concerns, and staff members were redesignated with titles and responsibilities such as Tech Team Digital Navigators.

2020 STUDY RESULTS (cont.)

Concerns Regarding Lack of Internet Access or Hot Spots Within Homes

Not a Concern 5%
Significant Concern 32%
Minimal Concern 36%
Moderate Concern 27%
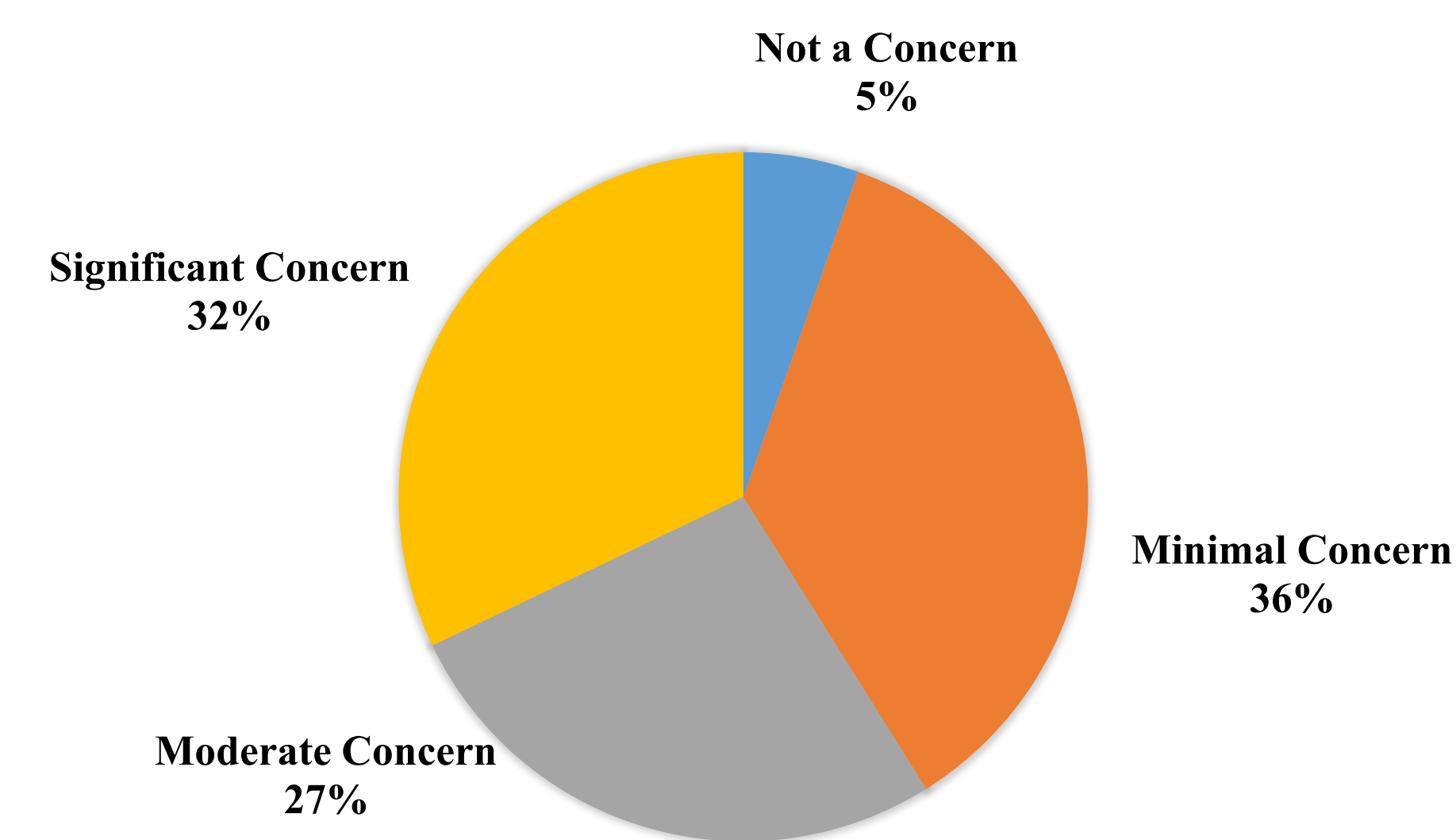
Districts assisted students and families, and in some cases, staff members, in gaining access to the Internet during the pandemic. This was primarily achieved through providing them with hotspots or working with their local Internet service providers (ISP) to negotiate a free or reduced price.

Concern Regarding Lack of Technology Devices in the Home

Significant Concern 23%
Not a Concern 29%
Moderate Concern 18%
Minimal Concern 30%
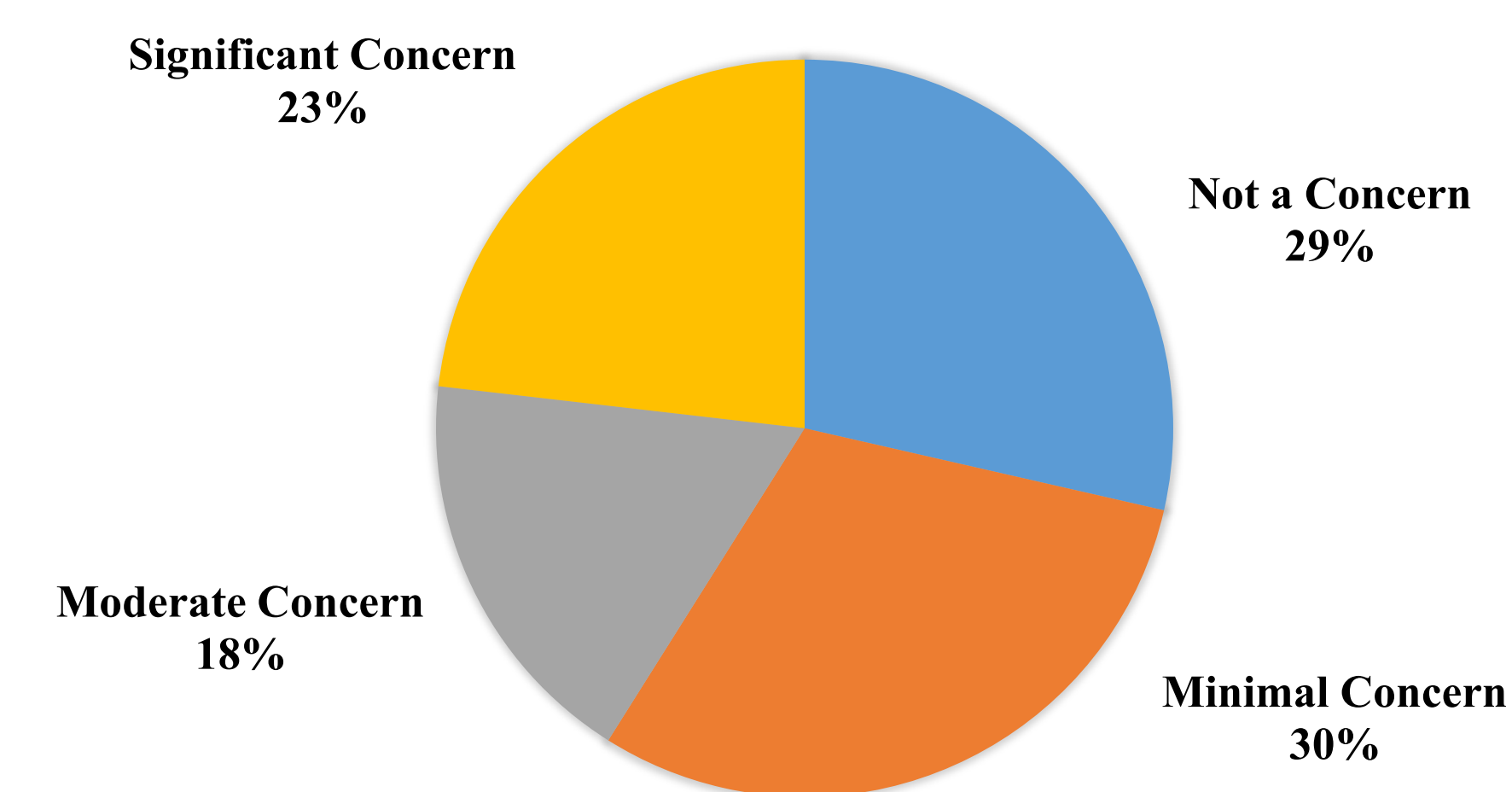
Districts reported having a 1:1 initiative in place prior to the pandemic while other districts transitioned to 1:1 due to the pandemic through the use of stimulus funds or dismantled carts of devices previously used as classroom sets. Districts without 1:1 platforms provided devices for students who expressed the need, allowed students to rent devices, or provided one device per family.

2022 STUDY ABSTRACT

The COVID-19 pandemic ushered in a dramatic shift to online learning for K-12 public schools, requiring school districts to address inequities that surfaced in the remote learning model. This poster includes the findings of the second study of a multi-year research project exploring the intersection of technology and educational inequities through the pandemic. As the pandemic waned, practitioners evaluated which practices developed during remote learning should be sustained. Five Minnesota technology directors participated in a focus group to discuss how inequities are being addressed in their schools post-pandemic. Technology directors explained that the pandemic was an opportunity to reimagine schools for the success of all students through an infrastructure that includes actions relative to three domains: effective instruction, school-home partnerships, and law and policy. Further research is recommended, such as broadening the geographical location of participants outside of Minnesota, expanding participants beyond the role of technology director (i.e., students, teachers, parents), and analyzing student enrollment in K-12 online schools through a longitudinal study.

2022 STUDY METHODOLOGY

This follow-up qualitative study sought to glean rich, detailed accounts of technology's influence on educational systemic inequities throughout the COVID-19 pandemic and beyond. Data was collected via a two-hour focus group comprised of Minnesota district technology directors using video conferencing technology (Zoom). Minnesota technology directors were invited through e-mail to participate in the study. Five technology directors, serving districts in the seven-county metropolitan area, participated in a focus group to discuss how their districts leveraged technology to navigate the pandemic, what they learned in the process, and what practices they will sustain moving forward. Process coding was conducted to identify emerging themes.

2022 STUDY RESULTS

How have schools leveraged technology to address inequities during the pandemic?

- **Providing Students Technology Devices and Ensuring Students Have Adequate Internet Access**

Most districts had one-to-one (1:1) initiatives in place for some, if not all, grade levels. Districts collaborated with local internet service providers (ISP) and expended COVID relief funds (ESSER) to provide homes with hotspots.

- **Identifying, Addressing, and Monitoring Families' Needs**

The necessity to utilize technology to engage with families through the pandemic led to improved parent engagement practices. Districts discovered that video conferencing removed barriers and created greater access for families, which increased participation in conferences and IEP meetings. Districts invested in a phone two-way text communication tool that translated messages to/from school and home language, which effectively engaged multilingual families.

- **Collaborating to Serve Students Receiving Special Education Services**

Participants described the technology staff as a "team partner" with special education teams guiding adaptations required to serve students throughout the pandemic. Assistive technology tools such as add-ons to Google Chrome for reading material texts, text-to-speech readers, and magnifying glasses were delivered to homes. Some students receiving special education services, specifically students on the autism spectrum, thrived in an online learning environment.

What technology-related practices, initiated during the pandemic to better serve underrepresented populations, have been sustained post-pandemic?

- **Experiencing Success in the Online Learning Environment and Choosing to Remain a Remote Learner**

There was an acknowledgement that remaining in a remote learning modality is what is best for some students, including those with disabilities, multilingual learners, and learners from a variety of cultural backgrounds (e.g. family oriented culture).

- **Expanding Effective Technology Use in the Classroom and Refining Teachers' Technology Skills**

School districts acknowledged teachers' steep technology learning curve at the start of remote learning. Teachers appear to be honing their technology expertise. They are posting to learning platforms at a greater frequency and exploring how software such as GoGuardian can be used to enhance classroom management at a distance. The use of software in the classroom is an evolving conversation moving from technical skill to effective pedagogy.

- **Reimagining Schools, Protecting Student Privacy, and Advocating for Continued Funding**

Technology directors expressed optimism for the opportunity to reimagine school as a consequence of the pandemic. Much change occurred as a result of the pandemic and school systems are still grappling with the impact of this change. Lingering difficulties and new opportunities coexist. It costs money to protect student data, maintain devices, and purchase new technologies.

CONCLUSIONS

Reimagining Schools for All Students' Success		
Effective Instruction	**School-Home Partnership**	**Law & Policy**
- Expanding Effective Technology Use in the Classroom and Refining Teachers' Technology Skills	- Identifying, Addressing, and Monitoring Families' Needs	- Protecting Student Privacy
- Experiencing Success and Choosing to Remain a Remote Learner	- Providing Students Technology Devices and Ensuring Students Have Adequate Internet Access	- Advocating for Continued Funding
- Collaborating to Serve Students Receiving Special Education Services		
- Prioritizing Mental Health and Diversity, Equity, and Inclusion		

Note. The Equitable Technology Infrastructure Model encompasses the actions school districts must embody to serve all students and families well.

As districts return to in-person learning, the open mindset to reimagine school systems must be maintained. The steep technology-related learning curve at the start of the pandemic cannot become a plateau. School districts are compelled to provide resources for continuous staff development in technology-related skills and pedagogy. In addition, districts need to ensure families have internet access, devices, and assistive technology tools. This is imperative for students from historically under-served groups that benefited from the online learning environment. Educators should advocate for continued funding for technology-related improvements to student learning experiences as well as understand and address the legal requirements to protect student privacy. Finally, districts should partner with outside agencies to advance social justice initiatives that stalled during the pandemic (e.g. mental health and racial/ethnic disparities).

RESEARCH PROJECT PUBLICATIONS

- Hill, J. & Reimer, T. (in final edits). Technology as a Tool to Address Educational Inequities: Practices Implemented During the COVID-19 Pandemic That Have Been Sustained. *Education and Information Technologies*
- Reimer, T. & Hill, J. (2023, July 14). 3 education wins sustained by district technology directors post-pandemic. *District Administration*. https://districtadministration.com/3-education-wins-school-district-technology-directors-post-pandemic/
- Hill, J. & Reimer, T. (2022, July 2). Fostering School-Home Partnerships: Transforming Learning as a Result of the COVID-19 Pandemic. *TechTrends, 66*. doi10.1007/s11528-022-00756-3
- Reimer, T. & Hill, J. (2022). Crossing the Digital Divide and the Equity Expanse: Reaching and Teaching All Students During the Pandemic. *Journal of Leadership, Equity, and Research, 8*(1). Retrieved from https://journals.sfu.ca/cvj/index.php/cvj/article/view/177
- Reimer, T. & Hill, J. (2021, September 8). COVID disruption requires more than providing a device. *District Administration*. https://districtadministration.com/covid-disruption-requires-more-than-providing-a-device/

RESEARCH PROJECT PRESENTATIONS

- Reimer, T. & Hill, J. (2023). Sustained Technology Practices Implemented During COVID-19 That Address Educational Inequities. International Council of Professors of Educational Leadership (ICPEL) Conference
- Reimer. T. & Hill, J. (2022). Leading in a New Era: How COVID-19 Transformed the School-Home Partnership. University Council for Educational Administration (UCEA) Annual Convention
- Hill, J. & Reimer, T. (2022). Applying Equity Literacy to Address the Digital Divide. Provost Summit, St. Cloud State University
- Reimer, T. & Hill, J. (2021). Addressing Technology Inequities: Closing the Digital Divide. National Alliance for Partnerships in Equity (NAPE) National Summit for Educational Equity