COVID, Chromebooks, & Drucker

The Fall and Rise of California Public Schools

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Abstract

During the global pandemic of the 2020–21 school year, school districts rapidly transitioned from the traditional in-person structure of school to distance learning. This research study sought to understand how superintendents envisioned virtual learning as an option within their school district portfolio, exploring the barriers faced in its development and making recommendations for effective implementation entering an era of post-pandemic education. This mixed-methods study was qualitative dominant research using interviews with a purposive sampling of California K–12 public school superintendents representing a variety of demographics. The quantitative data were derived from the coding of interview responses aligned to the conceptual framework provided by Peter Drucker's (1985) seven sources of innovative opportunity. Results of the study revealed examples of effective virtual learning programs as well as barriers to implementation, including changes to state legislation and the digital divide. The most frequent sources of innovative opportunity aligned to superintendent responses were identified as the unexpected and new knowledge, both scientific and non-scientific, the two sources with the most significant discrepancy of reliability, reflecting the vast discrepancy in approaches amongst surveyed superintendents. Implications

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for this research includes distinct recommendations for state education leaders and policy makers, including: adopting clear legislation in regards to independent study guidelines and funding formulas to support innovative approaches through virtual learning. This research provides superintendents, state education leaders, and policy makers unique guidance on the barriers as well as recommendations for opportunities virtual learning provides in overcoming the challenges K–12 public school districts face entering the unprecedented era of post-pandemic education.

Keywords: online learning, post-pandemic education, virtual learning, distance learning, innovative opportunity

Introduction

Beginning in February and March of 2020, school closures impacted at least 90% of the world's population of students, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates (Cavanaugh & Deweese, 2020). In the United States, the delivery of knowledge in a traditional classroom setting changed to exclusively online teaching overnight (Quezada et al., 2020). Traditional school systems uninitiated to online learning were forced to adapt their teaching practices and school operations to an unfamiliar modality with almost no training or experience from which to draw upon (Kingsbury & DiPerna, 2020).

Superintendents across the country explored innovative means to meet the unique challenges presented by the pandemic, finding opportunity through the crisis. Overcoming the sharp learning curve of distance learning program development, about two in ten districts reported in the spring of 2020 that they were already adopting, planning to adopt, or considering adopting virtual schools as part of their district portfolio citing reasons related to student and parent demand for continuing various forms of online instruction in future years (Schwartz et al., 2020). Given the significant role of superintendents in leading these efforts---and the challenges and opportunities included in the scaled program development of a virtual learning option---expanding the knowledge base on school superintendents' perceptions of virtual learning program development, its identified barriers, and recommendations for effective implementation will add to the body of knowledge on this topic.

As Superintendent Kyla Johnson-Trammell of Oakland Unified School District in California stated,

> This is not a moment, this is an era that we're in right now. It will require us to continue to exercise adaptive leadership and creativi-

> ty, while maintaining grace and compassion with one another as students, parents and community, as we are all working to figure this out. (as cited in Jones et al., 2020, para. 6)

Considering that less than half of 1% of U.S. K–12 students were enrolled in an online school pre-pandemic (National Center for Education Statistics, 2020), the complexity of instituting a virtual learning option is unique in its scale nationwide. It is also an issue that has been encountered on a local level by superintendents in the past, with the study from Johnson and Strange in 2007 indicating an understanding of a growing interest in online learning programs to meet a variety of student needs within K–12 public school systems as well as the recommendation proposed by the research of Rose and Plants in 2010 that school leaders should seek out additional information to online learning in an effort to better understand the approach and its potential within K–12 public schools. Previous studies on superintendents' perceptions of remote learning programs reflect common trends in the opportunities as well as barriers faced in the development of a virtual learning program, including the research by Augustine-Shaw (2001) in Kansas and the completed research by Robinson (2007) in Ohio and Malone (2012) in Washington. As early as 2005, Glick noted a rapidly changing landscape that was challenging districts to adapt more quickly than they were accustomed to, with many districts lacking the expertise to implement and manage quality online learning programs (Schwirzke, 2011). This landscape has only accelerated in its evolution since that time due to significant progression with technology and a global pandemic. Previous research has revealed the challenges to the development of a comprehensive remote learning program did not arrive with the pandemic; rather, they have been present in K–12 public schools nationwide for decades leading up to the pandemic and dramatically exposed once school districts were dependent upon it as the primary vehicle for teaching and learning. Superintendents have entered an era of post-pandemic education with a sense of urgency in addressing students' unique social-emotional and academic needs coinciding with the potential opportunities and challenges of developing a virtual learning program within their district. Their perceptions on the development of virtual learning programs, existing barriers, and recommendations for effective implementation ultimately necessitate further research to increase the knowledge base for school leaders and elected officials in this unique crossroads for K–12 public school districts.

The purpose of this inquiry project was to examine the perceptions of a purposive sampling of selected California K–12 public school district superintendents on the design of virtual learning programs, the

identified barriers, and recommendations for overcoming those barriers for effective implementation. The study was guided by the following research questions:

1. What are examples of innovative virtual learning implemented in selected California K–12 public schools following the COVID-19 worldwide pandemic?

2. What recommendations do selected K–12 public school superintendents have for overcoming identified obstacles for effective implementation of virtual learning?

Conducting an analysis from data retrieved between school districts and the identified characteristics ranging from urban versus suburban versus rural, large versus small school populations, high versus low free and reduced lunch percentages, as well as high versus low emerging multilingual student populations allowed for increased understanding in the development of virtual learning programs, identified barriers, and potential solutions for superintendents to consider. Despite the growing presence of online learning in both P–12 and higher education, even pre-pandemic, the research literature addressing possible intersections with superintendents continues to be sparse (Kennedy et al., 2018). Until a more robust research base exists to inform practice, educators and policymakers will continue to implement online learning environments without much guidance from the scholarly literature (Kennedy et al., 2018). The significant gap in the literature has prompted this research study. Empirical evidence resulting from this study will inform future development of state, county, and district leadership efforts to support expansion of student access to effective virtual learning opportunities in public schools.

Theoretical Framework

In his book, *Innovation and Entrepreneurship*, Drucker (1985) proposed a definition of innovation just as relevant in the 35 years prior to the pandemic as it is on the brink of the current post-pandemic era of education: "Entrepreneurs innovate. Innovation is the specific instrument of entrepreneurship. It is the act that endows resources with a new capacity to create wealth" (Drucker, 1985, p. 30). In the context of this topic of study, it serves as the conceptual framework and provides the opportunity for an exchange of Drucker's operative terms for those relevant to this research; exchanging "entrepreneurs" for "superintendents", "entrepreneurship" for "leadership," and assigning meanings within the focus discipline of education to the term "resources" as edu-

cators and "wealth" as learning: *Superintendents innovate. Innovation is the specific instrument of leadership. It is the act that endows educators with a new capacity to create learning.*

The global pandemic resulting from COVID-19 revealed the enormous potential for innovation within the historically traditional field of education, illuminating considerable capacity for innovation by a variety of stakeholders (Reimers et al., 2020). In their 2020 report: *Schooling Disrupted, Schooling Rethought,* Reimers et al. suggested:

> One of the lessons that needs to be examined and assimilated is what processes unleashed such potential and how can such innovative capacity be extended going forward. Just as the pandemic will create some unexpected burdens to education, it could also generate a dividend in innovative capacity. This dividend should be catalyzed so that education systems do not merely attempt to "return to the past normal" but address what have been well-recognized shortcomings in the capacity to educate students with the full range of skills essential to build a better future. (p. 7)

Drucker (1985) referenced a systematic innovation consisting of seven sources for innovative opportunity to assist in this examination of education during the global pandemic crisis, defined as consisting in the "purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation" (p. 35). The seven sources of systematic innovation applicable to the approaches of superintendents during the abrupt transition to distance learning include:

> 1. *The unexpected*—the unexpected success, the unexpected failure, the unexpected outside event;
>
> 2. *The incongruity*—between reality as it actually is and reality as it is assumed to be or as it "ought to be";
>
> 3. *Innovation based on process need*;
>
> 4. *Changes in industry structure or market structure that catch everyone unawares*;
>
> 5. *Demographics* (population changes);
>
> 6. *Changes in perception, mood, and meaning*;
>
> 7. *New knowledge, both scientific and non-scientific.* (Drucker, 1985, p. 35)

The seven sources for innovative opportunity form a unique lens through which to apply the approaches of superintendents during the shift to distance learning resulting from the COVID-19 pandemic, further examining the examples of virtual learning program development

as well as the identified barriers and recommendations for effective implementation. Additionally, in moving forward with these considerations for virtual learning by superintendents, Drucker (1985) identified five basic criteria required for successful innovations:

1. A self-contained process;
2. One "weak" or "missing" link;
3. A clear definition of the objective;
4. That the specifications for the solution can be defined clearly;
5. Widespread realization that "there ought to be a better way," that is, high receptivity. (p. 73)

Methods

This mixed methods study utilized an exploratory sequential design informed by Peter Drucker's (1985) seven sources of innovative opportunity, leveraging both the quantitative and qualitative methods in an integrated manner to provide a comprehensive approach to the prevalence, context, and individual experience of the identified topic of study (Leavy, 2017).

As a first step, the population included a purposive sampling of California K–12 public-school county office of education superintendents ($N = 4$) representing different geographic regions throughout the state to reflect a variety of demographics in informing the research analysis, as well as a variety of district superintendents and/or their designees. The four county superintendents were asked to recommend innovative district superintendents. Then, as a second phase, those ten identified district superintendents ($N = 10$) resulting from those recommendations were interviewed, resulting in $N = 14$ total participants. This research study was implemented through a mixed methodology approach with open-ended questions as well as individual interviews related to the research questions for the study. All interviews consisted of both questions and instructions and were in the context of sampling and design, data processing and analysis, pilot testing, response rate, and reporting results (Fink, 2009). To establish content-validity, a panel of experts was used.

Data Sources and Analysis

The purpose of this study was to examine examples of selected California K–12 public school district superintendents' design of virtual learning programs, the barriers to implementation, and recommenda-

tions for overcoming the identified barriers in the era of post-pandemic education, K–12 California public school superintendents' perspectives regarding virtual learning development, barriers faced in implementation, as well as insights on overcoming those barriers were examined. The electronic survey was hosted by Google Forms, providing reports with statistics summarizing the responses. The data analysis included quantitative and descriptive analysis, based on coding aligned with the seven sources of innovative opportunity (Drucker, 1985) and selected characteristics of each participating school district aligned to the research questions. The qualitative data through interviews with the district superintendents provided further context for the research questions as well as clarifications and implications for further study. The data collected by each of the methods was analyzed in order to provide an overview of the information collected to test the research expectations that had been developed, ensuring the establishment of causality to the greatest extent possible (Brown & Hale, 2014).

Results

Initiating the two-step survey that informed the research, the following question was posed to the purposive sampling of California county superintendents ($N = 4$; see Table 1): *What school districts within your county have developed an innovative approach through technology to support students and families?*

Informed by the responses of the selected county superintendents, ten district superintendents (*N = 10)* were interviewed with the following interview questions:

1. What are some examples of effective virtual learning you have implemented for the 2021–2022 school year?

2. What are the barriers that have impeded the implementation of a virtual learning program within your school district?

Table 1
Regional Demographics of Surveyed Superintendents

County Region	*Local*	*Total Enrollment*	*Percentage of English Learners*	*Percentage of & Reduced Qualifying*
North	Rural	>26,000	3%	54%
Bay Area	Suburban	>31,000	15%	29%
Central	Urban	>205,000	18%	76%
South	Urban	>490,000	17%	49%
California	Statewide Average	>6,000,000	17%	58%

3. What recommendations do you suggest for overcoming barriers for successfully implementing a virtual learning program?

4. Do you have any additional comments or suggestions about virtual learning programs for the upcoming school year that you would like to include?

Table 2 reflects the demographics and localization of the responding K–12 public school district superintendents, and/or their designees, interviewed during this research:

Question #1

What are some examples of effective virtual learning you have implemented for the 2021–2022 school year?

Responses to this question from district superintendents and/or their designees ranged from: the use of technology to provide transparency amongst education partners in switching courses to google classroom, proactive planning for virtual learning with professional learning and prep days to support use of the technology, as well as, the use of robotic technology, such as Swivel to connect students and teachers. Common themes that surfaced in the responses included: the effectiveness of a virtual learning academy dependent upon a single staff member overseeing the program, incorporation of new educational technology simultaneously scaled to more classrooms than in years prior, and a higher number of families interested in a virtual learning option than initially anticipated.

Table 2
District Demographics of Surveyed Superintendents

District Code Number	*Region*	*Total Enrollment*	*Percentage of English Learners (EL)*	*Percentage of Free & Reduced Lunch Qualifying Families*
110	North	>600	<1%	18%
430	Central	>4,000	45%	90%
400	Central	>5,000	31%	90%
120	North	>3,000	2%	63%
440	Central	>1,400	34%	85%
210	Bay Area	>1,400	6%	8%
300	South	>16,700	35%	68%
420	Central	>1,500	54%	84%
200	Bay Area	>7,400	15%	36%
340	South	>18,000	12%	56%

Frequent sources of innovative opportunities surfaced included: #1 *The unexpected*—the unexpected success, the unexpected failure, the unexpected outside event; #3 *Innovation based on process need*; and #7 *New knowledge, both scientific and non-scientific.*

Comparative responses and sources of innovative opportunities among identified demographics and locales included: *the unexpected* as a source of innovative opportunity present amongst all interview respondents, the creation of a dedicated virtual academy in large school districts, parent interest in a virtual learning option was perceived as high for small school districts with a high percentage of EL students and high F&R qualifying families versus a perception of low interest for small school districts with a low percentage of EL students and low F&R qualifying families, perception of planning for a virtual learning option prior to the onset of the pandemic resulting in a sustained virtual learning program for students was present across a variety of demographics and locales, and reference to the impact of legislation regarding independent studies on implementation of virtual learning in the 2021-22 school year was also present across a variety of demographics and locales.

Additionally, the sources of innovative opportunity surfaced by respondents were distributed throughout a variety of school district demographics and locales without clear connection to any particular descriptor.

Question #2

What are the barriers that have impeded the implementation of a virtual learning program within your school district?

Responses to this question from district superintendents and/or their designees ranged from: ensuring access and internet connectivity to homes, family support and the structure of the home environment, as well as, teachers' current skill set instructing in an online setting. Common themes that surfaced in the responses included: confusion over the language of the state legislation, internet access and connectivity, training and support for teachers, available support at home for students, social-emotional connections for students; staffing; sustained student engagement.

Comparative responses among identified demographics and locales included: staffing as well as internet access and connectivity challenges amongst small school districts, lack of family interest for small school districts, support capacity at home for school districts with a high percentage of F&R qualifying families, and concern for social-emotional

supports for small school districts with a high percentage of F&R qualifying families.

Question #3

What recommendations do you suggest for overcoming barriers for successfully implementing a virtual learning program?

Responses to this question from district superintendents and/or their designees ranged from: recommendations for a virtual learning academy to be part of the district ecosystem for students and families, providing a strong curricular partner specific to online learning in supporting teachers, and having clear expectations in recruiting teachers for virtual learning with proven high-level tech skills. Common themes that surfaced in the responses included: intentional staffing plan targeting quality virtual learning instructors, dedicated support and training for teachers, web-based and in-person opportunities to support students and families, and a collaborative approach including certificated and classified staff members.

Frequent sources of innovative opportunities surfaced included: #3 *Innovation based on process need*; #6 *Changes in perception, mood, and meaning*; and #7 *New knowledge, both scientific and non-scientific.*

Comparative responses and sources of innovative opportunities among identified demographics and locales included: source of innovative opportunity #4 *Changes in industry structure or market structure that catch everyone unawares*—was reported by two school districts, both of which have high percentages of F&R qualifying families; source of innovative opportunity #6 *Changes in perception, mood, and meaning* was reported by two out of three large school districts; the only two school districts not identifying characteristics consistent with #3 *Innovation based on process need,* were both small school districts; similarly the only school districts not identifying characteristics consistent with #6 *Changes in perception, mood, and meaning* were small school districts as well.

Question #4

Do you have any additional comments or suggestions about virtual learning programs for the upcoming school year that you would like to include?

Responses to this question from district superintendents and/or their designees ranged from the perception of virtual learning continuing as an option with increased parent interest to a virtual learning as a sustainable option and model moving forward. Responses reflecting this sustainable option were specifically noted in anticipation of a po-

tential drop in enrollment once the pandemic subsides. Additional responses included the questioning of how much a public-school district is willing to invest in the opportunity relative to the number of families interested and the potential of virtual learning with concepts such as the Metaverse, becoming a complex and rich educational experience to keep abreast of in the likely case of a future disruption to the school system. Common themes that surfaced in the responses included: the influence of parent interest on development/ continuing virtual learning as an option for students, the incorporation of education technology for both in-person and virtual instruction, the importance of planning initiated prior to the pandemic, and the need for continued planning for potential future disruptions to the school system.

Frequent sources of innovative opportunities surfaced included: #4 *Changes in industry structure or market structure that catch everyone unawares;* #6 *Changes in perception, mood, and meaning*; and #7 *New knowledge, both scientific and non-scientific.*

Comparative responses and sources of innovative opportunities among identified demographics and locales included: the only school districts not identifying characteristics consistent with *Changes in industry structure or market structure that catch everyone unawares* were the large school districts; small school districts largely reported characteristics consistent with both #6 *Changes in perception, mood, and meaning* and #7 *New knowledge, both scientific and non-scientific;* the two school districts reporting characteristics consistent with #3 *Innovation based on process need* had a high percentage of F&R qualifying families and high percentage of EL students.

Table 3 provides a summary of the percentage of each source of innovative opportunity surfaced in responses to the interview questions. The highest percentage of responses surfaced within question one were consistent with source #1 *The unexpected*—representing 32.2% of the sources presented as well as source #7 *New knowledge, both scientific and non-scientific*—with a representation of 19.4%. Furthermore, no school districts indicated characteristics related to source #5 *Demographics*—in their interview responses to this question.

Table 3:
Drucker's Seven Sources of Innovative Opportunity Frequency within Interview Responses by Question

	Source 1	*Source 2*	*Source 3*	*Source 4*	*Source 5*	*Source 6*	*Source 7*
Q1	32.2%	12.9%	16.1%	9.7%	0%	9.7%	19.4%
Q3	0%	0%	32%	0.8%	0.4%	28%	28%
Q4	0.9%	0.4%	0.9%	30.4%	0.4%	21.7%	21.7%

The highest percentage of responses surfaced within question three were consistent with source #3 *Innovation based on process need*—representing 32%, as well as, source #6 *Changes in perception, mood, and meaning*—and source #7 *New knowledge, both scientific and non-scientific*—both representing 28% of sources of innovative opportunity in responses. Furthermore, no school districts indicated characteristics related to source #1 *The unexpected*—or source #2 *The incongruity*—as well as only one response aligned to source #5 *Demographics*—in their interview responses.

The highest percentage of responses surfaced within question four were consistent with source #4 *Changes in industry structure or market structure that catch everyone unawares*—representing 30.4% with high representation amongst source #6 *Changes in perception, mood, and meaning*—and source #7 *New knowledge, both scientific and non-scientific*, both representing 21.7% of sources of innovative opportunity in responses. Furthermore, source #2 *The incongruity*—and source #5 *Demographics*—were represented just one time amongst all responses to the question (see Table 4).

Source #7 *New knowledge, both scientific and non-scientific*; was identified as the highest representation of innovative opportunity amongst all responses with 22.7%, while source #5 *Demographics;* had the lowest representation within total responses at 2.5%. Sources #1 *The unexpected*, #3 *Innovation based on process need*, #4 *Changes in industry structure or market structure that catch everyone unawares*, and #6 *Changes in perception, mood, and meaning*; also had significant and similar representation ranging in percentage from 15.2-18.9%.

School districts with the following demographics were the most significantly represented amongst responding superintendents: low percentage of EL students, high percentage of F&R qualifying families, small enrollment size, and the central region of California. School

Table 4
Drucker's Seven Sources of Innovative Opportunity Overall Frequency in Interview Responses

Source of Innovative Opportunity	*n*	*Percent*
1	12	15.2%
2	5	6.3%
3	15	18.9%
4	12	15.2%
5	2	2.5%
6	15	18.9%
7	18	22.7%

districts with the following demographics were the least represented amongst responding superintendents: high percentage of EL students, average percentage of F&R qualifying families, and large enrollment size (see Table 5).

The following demographics and regions responded with the highest percentage of sources of innovative opportunity: low EL student enrollment, high F&R qualifying families, small enrollment size, and from the Central region. The percentage of sources of innovative opportunity mirrors the representation of demographics respondents represented except for those districts with a low percentage of F&R lunch qualifying families accounting for a higher representation of respondents, but a lower percentage of sources of innovative opportunity surfaced than those representing school districts with an average percentage of F&R lunch qualifying families.

The demographics and regions that corresponded to the highest average number of sources of innovative opportunity during the interview were identified with the following: high percentage of EL students, average percentage of F&R lunch qualifying families, large sized districts, and from the south region. Additionally, while respondents from small sized school districts comprised 70% of interview respondents, the average number of sources of innovative opportunity was only nearly half that of respondents from large size school districts.

Table 5

Percentage of Respondents and Sources of Innovative Opportunity Surfaced by Demographic and Region

Demographics & Locale	*Percentage of Respondents*	*Percentage of Sources of Innovative Opportunity Surfaced*	*Average Number of Sources of Innovative Opportunity Surfaced*
Low EL	50%	12%	7.6
Average EL	30%	6.9%	7.33
High EL	20%	6%	9.5
Low F&R	30%	5.1%	5.33
Average F&R	20%	7.3%	11.5
High F&R	50%	12.7%	8
Small	70%	16.1%	7.29
Large	30%	8.9%	14
North	20%	4.1%	6.5
Bay Area	20%	5.1%	8
Central	40%	10.1%	8
South	20%	5.7%	9

Discussion

The accelerated rate at which school districts nationwide transitioned from the traditional in-person structure of school to distance learning in response to the global pandemic, the vast spectrum of effectiveness in the development of virtual learning programs and barriers to implementation, as well as the resulting interests from families and new guidance from state leadership moving forward all provided rationale for the significance of this study. This research represents a unique opportunity to explore superintendents' vision for virtual learning as an option within their school district portfolio. Reflecting on the barriers they have faced in its development and recommendations for overcoming the identified barriers for effective implementation provides valuable data for education leaders in their consideration of virtual learning programs and their role in meeting unprecedented and evolving student and family needs in post-pandemic education.

As evidenced by examples of prior research, the challenges of developing virtual learning programs within K–12 public school systems were not born out of the pandemic. Similar to many other societal inequities, these barriers were magnified in the global crisis. Answering the research questions presented by this study at the crossroads of increased parent interest and evolving state legislation entering an era of post-pandemic education represented an important opportunity to contribute to the scant research to inform superintendents on how to proceed in the potential development of a virtual learning option within their district and address the anticipated barriers to effective implementation.

Just as Drucker (1985) proposed that "successful entrepreneurs do not wait" (p. 34), successful superintendents cannot continue to wait under the current conditions. The changes resulting from a global pandemic provide immediate opportunity for the new and different within the field of education (Drucker, 1985). Exploiting change through the timely and systematic examination offered through the seven sources for innovative opportunity as a conceptual framework for exploring responses from the selected superintendents bridges the effective approaches of entrepreneurism and innovation presented by Drucker in 1985 with the potential for a true 21st century evolution of the school experience for students, families, and educators. Empirical evidence resulting from this study will inform future development of state, county, and district leadership efforts to support expansion of student access to effective virtual learning opportunities in K–12 public schools.

This study's findings may help K–12 public school superintendents

better understand the existing barriers to implementation of virtual learning programs, recommendations to overcome the identified barriers, and the potential influence of school district demographics. Part of the study focused on superintendent perceptions of effective virtual learning programs resulting from the global pandemic. A purposive sampling of responding K–12 public school superintendents reported the influence of the global pandemic as an unexpected outside event and the subsequent incorporation of new technology in supporting virtual learning with high frequency amongst interview responses, aligning with sources #7 *New knowledge*, both scientific and non-scientific and #1 *The unexpected*. It should be noted that these two sources represent the furthest extent possible of reliability and predictability across the spectrum of sources of innovative opportunity.

Responding superintendents across regions and demographics believed that the forced disruption to the traditional school system resulting from the global pandemic presented the opportunity to deliver teaching and learning in an online venue, a medium which few had explored prior, in a more accelerated transition than most were prepared for. Superintendents reported that the shift to virtual learning during the pandemic was done on a larger scale than school initiatives are typically implemented—resulting in a vast range of perceived effectiveness amongst education partners such as teachers and families. Interview responses surfaced three trends amongst responding superintendents in their plans for effective virtual learning entering the 2021–2022 school year:

1. Superintendents who did not perceive virtual learning as effective during the pandemic of the 2020–2021 school year due to personal and stakeholder responses, along with minimal interest from families as a preferred option, dedicated efforts towards innovative means to navigate evolving COVID-19 protocols and local county health guidelines to return all students back to in-person learning full time.

2. Superintendents who perceived potential effectiveness in utilizing the innovations gained through the use of specific technology during the pandemic, but did not have the perceived family interest or staffing capacities to develop a comprehensive virtual learning program, pursued innovation through the use of simulcasting technology between teachers and students in the classroom with those either opting to remain at home or be excluded from the school setting due to COVID-19 protocols.

3. Superintendents who elected to continue with dedicated and intentional plans in the development of a virtual learning program within their district were influenced by their own personal perceptions of its

potential as well as staff and family interest resulting from their efforts during the global pandemic.

This study also sought to identify the perceived barriers to the implementation of virtual learning programs entering the 2021–2022 school year for K–12 public school districts. Responding superintendents across regions and demographics surfaced the obstacles and restrictions presented by state legislation through the language of SB-130, as well as staffing and personnel capacity, as significant challenges to the development of a virtual learning program, with rural schools most notably surfacing the challenges of internet access and connectivity, similar to the study done over ten years ago by Barbour and Reeves (2009), reflecting the ongoing barriers this demographic of schools continues to face in the state of California.

Conclusion

A primary goal of the study was to identify recommendations from K–12 public school districts representing a variety of regions and demographics throughout California to help inform education and policy leaders about the potential of virtual learning as an option for interested families. Responding superintendents across regions and demographics largely continued to surface statements aligned with source of innovative opportunity #7 New knowledge, both scientific and non-scientific. Additionally, superintendents presented significant frequency of both source #6 Changes in perception, mood, and meaning; and #3 Innovation based on process need; reflecting the influence of stakeholder perception on virtual learning as an option for students and its meaning as a venue for teaching and learning, as well as the importance of the components of process need that translate to the proactive planning for a dedicated virtual learning program.

When provided an open-ended question on additional thoughts to elicit input on further contributions to the research, the most frequent source of innovative opportunity surfaced was #4 Changes in industry structure or market structure that catch everyone unawares. Superintendents believed the influence of families to be the market in determining the sustainability of a virtual learning program moving forward—particularly amongst those districts with high percentages qualifying for free and reduced lunch status; also reflected in nationwide sentiments from low socioeconomic families and marginalized communities on the need for additional school program options for students.

While specific connections between sources of innovative opportunity and responding superintendent district demographics and regions

were present, the source with the highest overall frequency was #7-New knowledge, both scientific and non-scientific, born out of the unexpected outside event (source #1) of the global pandemic. These sources were aligned to responses from superintendents in districts across all regions and demographics. Drucker (1985) concurred in respect to the receptivity of this new knowledge as a source of innovative opportunity:

> And then one can ask: 'What does this innovation have to reflect so that the people who have to use it will want to use it, and see in it their opportunity?' Otherwise, one runs the risk of having the right innovation in the wrong form—as happened to the leading producer of computer programs for learning in American schools, whose excellent and effective programs were not used by teachers scared stiff of the computer, who perceived the machine as something that, far from being helpful, threatened them. (p. 135)

While computers have become commonplace since this statement in 1985, the notion of receptivity for new knowledge in innovation—specifically connected here to the school system—remains the same. This theme was reflected in the results of the study on how the perception of virtual learning post-pandemic for education partners is seen as their opportunity, as either helpful or as a threat. "Most innovations in public-service institutions are imposed on them either by outsiders or by catastrophe" (Drucker, 1985, p. 177).

The global pandemic resulting from the sudden spread of COVID-19 was the catastrophe that opened the door for innovation in our school districts through source #1 *The unexpected*: the unexpected success, the unexpected failure, the unexpected outside event. It was the only source that surfaced in alignment with 100% of superintendents' responses to effective virtual learning resulting from the pandemic during the research interviews and underscores both the impact and opportunity presented across all regions and demographics studied. In regards to the unexpected as a source of innovative opportunity, Drucker (1985) asserted that "It takes an effort to perceive in the 'enemy' one's own best opportunity" (p. 39). In the "enemy" of the global pandemic and rapid transition to virtual learning, some responding superintendents identified unexpected successes: from increased parent interest to uniformity through an online platform across grade levels, as well as improved family connections, among others. To exploit the opportunity of the unexpected success, superintendents must not only have been looking for it—but also provided intentional analysis of it once identified. The unexpected successes were buried underneath the once in a lifetime unexpected event of a global pandemic, easily

overseen by superintendents fielding a litany of challenges to simply develop a venue for teaching and learning: from rapidly evolving safety protocols and procedures to access to technology for families and lack of clarity with state legislation, as well as the innumerable societal issues that surfaced for students and families including job loss with housing and food insecurity.

The unexpected outside event may well be the innovative area with the greatest opportunity and lowest risk (Drucker, 1985), but for superintendents during this pandemic it also coincided with significant and unprecedented challenges that overshadowed their perceived time, resources, and personnel to exploit as an opportunity. For those who were able to exploit the unexpected event in developing a virtual learning program option, there was a distinct connection to themes within source of innovative opportunity #3 Innovation based on process need. Additionally, superintendents across all demographics and regions provided responses aligned to source of innovative opportunity #7 New knowledge, both scientific and non-scientific. The new knowledge in this case represents the use of virtual learning and technology as a primary venue for teaching and learning both during the pandemic as well as entering the 2021–2022 school year. Drucker (1985) referred to knowledge-based innovation as the "superstar" of entrepreneurship, the source most people refer to when discussing innovation. "And like most 'super-stars,' knowledge-based innovation is temperamental, capricious, and hard to manage" (Drucker, 1985, p. 107). It is this complexity within the most frequent source of innovative opportunity surfaced that reflects responding superintendents' spectrum of effective virtual learning program implementation irrespective of their school district demographics and/or region.

Superintendents who developed a virtual learning program for the 2021–2022 school year also identified a clear approach through proactive planning during the previous school year, surfacing aligned elements to process need with their planning through dedicated staffing, professional learning and stakeholder engagement, among others. The superintendents who began planning for a virtual learning program, successfully gambled on the receptivity from their enrolled families with a "build it and they will come" approach. These interested families represented the change in the industry or market structure as defined in source of innovative opportunity #4. Responding superintendents who developed a virtual learning program for the 2021–2022 school year also reported high interest from families in attending, although it is unclear whether the interest from families was as a result of the development of the virtual learning program or the development of the

virtual learning program was as a result of the interest from families. The effectiveness in the development of the virtual learning program was ultimately attributed to not only the opportunity presented by the unknown and the inclusion of new knowledge, but also the necessity to leverage additional sources of innovative opportunity–most notably, those of the process need. Without the embedding of technology within a broad entrepreneurial approach, it simply devolves into a mountain-top without a mountain (Drucker, 1985).

This study contributes to the literature on research of virtual learning in K–12 public schools resulting from the global pandemic by building on the aforementioned studies and adding to the knowledge base of the research topic. This research added the dimension of a timely exploration during a global pandemic, the conceptual framework guided by Peter Drucker's (1985) seven sources of innovative opportunity, and superintendents' recommendations for overcoming the identified barriers to implementation of virtual learning programs. In sum, this study may provide some insight to other superintendents seeking to implement an effective virtual learning option within their district's portfolio of options for local students and families. Finally, this research provides state education leaders and policymakers some guidance on the barriers and recommendations through virtual learning for overcoming the challenges K–12 public school districts are facing in addressing a variety of student and parent needs entering an era of post-pandemic education.

Research Limitations

A methodological assumption that underlies this research was the ability to gather substantive honest data from the open-ended questions within the interviews to provide a basis for understanding examples of superintendents' development of virtual learning programs, barriers to effective implementation, and recommendations for overcoming the identified barriers within California K–12 public schools (Schwirzke, 2011). The time available to conduct the study and the number of subjects who participated in the interviews limited this study. Only a stratified sampling of county and subsequently identified district superintendents of California K–12 public-school districts were included in the study.

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