

RESEARCH ARTICLE

Teachers and School Health Leaders' Perspectives on Distance Learning Physical Education During the COVID-19 Pandemic

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ABSTRACT

BACKGROUND: Due to the COVID-19 pandemic, students and teachers have transitioned to online learning. The transition required changes in teaching practices to accommodate for an online learning environment. However, there are no studies characterizing physical educators' and school health experts' perspectives on physical education via distance learning or identifying best practices and their implications for student health.

METHODS: Using purposive and snowball sampling, we conducted semi-structured interviews with 19 physical education teachers and school health experts across 21 California school districts on best practices for physical education via distance learning. Interviews were recorded, transcribed, and analyzed using a grounded theory approach.

RESULTS: Four major themes emerged: (1) participants felt high quality physical education via distance learning was both critical and possible; (2) strategies for creating a successful distance learning environment included personalization, creativity, and inclusiveness; (3) resources necessary for success included professional development, administrative support, and equipment; and (4) lessons for the long-term.

CONCLUSIONS: Participants identified effective strategies, challenges, and recommendations for the future. Participants felt optimistic about their ability to provide quality physical education via distance learning, given the necessary supports, and perceived that they played a critical role in supporting student health during the COVID-19 pandemic.

Keywords: physical education; distance learning; child health; best practices.

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In response to the COVID-19 pandemic, many schools transitioned from in-person to online education for K-12 students. In California, all schools closed in-person activities on March 19, 2020, in response to the governor's "stay-at-home" orders and most schools have remained closed through all of 2020.¹ Consequently, many public schools which previously had no or very limited experience with distance learning physical education had to quickly develop and implement new educational programming. Education Code 33352 requires a minimum of 200 minutes of physical education instruction every 10 school days for students in grades 1-6 and a minimum of 400 minutes

every 10 school days for students in grades 7-12.² Recognizing increased demands on schools and families during the pandemic, the California Department of Education issued an executive order that waived these physical education instructional requirements as well as requirements to provide adequate facilities for physical education, and to administer the annual Physical Fitness Test, which measures aerobic capacity, body composition, flexibility, and muscular strength/endurance in grades 5, 7, and 9.³ Further, many school districts announced that students' performance, with respect to grades and attendance, during the school closures in the spring of 2020 would

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not result in a lower grade than what students had achieved prior to school closures.⁴

Early reports on the impact of the COVID-19 public health response suggest children have fewer opportunities for physical activity and social-emotional skill building, while experiencing greater levels of stress and mental health problems.⁵ These concerns are particularly heightened in low-income and minoritized communities, that have been disproportionately affected by the pandemic and also may have access to fewer resources that support physical activity and social-emotional wellbeing. In California, physical education content standards focus on motor and movement skill development, physical fitness, and social-emotional skills.⁶ Therefore, maintaining physical education may be particularly important during the COVID-19 pandemic and subsequent recovery.

Physical activity supports the physical health, mental health, and academic success of school-age children.⁷ Adherence to daily physical activity recommendations is associated with improved body composition, skeletal and metabolic and cardiovascular health, improved daily functioning, sleep and overall mood.⁸⁻¹⁰ Expanding opportunities for physical activity in early childhood is important, as studies suggest fitness habits develop at a young age and may lead to long-term habits.⁸ Consistent physical activity is associated with positive mental health and psychosocial outcomes.¹¹⁻¹⁶ Physical education is one important way of increasing physical activity in schools, which is associated with reduced depression, stress, and anxiety.⁸ In addition, physical activity is linked to brain areas that support cognitive functioning,¹⁷ and higher levels of academic performance.¹⁶

Given the abrupt transition to distance learning and importance of maintaining physical education to support student health, it is critical to understand the best practices for delivering physical education via distance learning. Although a number of organizations and learning websites collate general recommendations for online learning practices, there are no studies focusing on online physical education, which presents unique challenges for educators given the traditional reliance on face-to-face interactions and observations. Further, there are no studies using qualitative methods to systematically capture the range of experiences and perspectives of physical educators and school health experts regarding distance-learning physical education. Hence, we sought to characterize physical education teachers' and school health experts' perspectives on physical education via distance learning during the COVID-19 pandemic.

METHODS

We conducted a qualitative study of California physical education teachers and school health experts.

Participants

Participation was limited to physical education teachers or school health experts in the state of California. Study information was distributed through statewide physical education and school health professional networks and listservs. We also employed snowball sampling, whereby participants were asked to nominate and/or invite others in their network. We sought to interview participants working with a variety of grade levels and school systems, given that the experience of delivering physical education via distance learning is likely to vary by student age, developmental needs, and local resources. Sampling continued until thematic saturation was achieved.

Instrumentation

The semi-structured interview guide focused on understanding current education practices, best practices for student engagement, barriers, and facilitators for delivering physical education via distance learning, and recommendations for the future. Two different guides specific to the role of school health experts and physical educators were created from the current literature and feedback from study team members, which include experts in school health and physical education. The main questions were specific to the participant's corresponding role but both interview guides focused on the same topic areas (Table 1). Each topic was explored using a main question followed by additional probing questions to elicit a deeper

Table 1. Discussion Topics for Teachers and School Health Experts

Discussion topic: current education practices
Teachers: What strategies are you using to deliver physical education via distance learning?
School Health Experts: What strategies are you/your school(s) using to deliver health education while distance learning is in place?
Discussion topic: best practices for student engagement
Teachers: How are you maintaining student engagement?
School Health Experts: How are you/your school(s) maintaining student engagement in physical activity?
Discussion topic: barriers and facilitators for delivering physical education in the future
Teachers: How are you thinking about physical education for the upcoming school year?
School Health Experts: How are you thinking about supporting health and physical education for students in the upcoming school year?
Discussion topic: resources and administrative support
Teachers: What support can schools provide to help maintain physical education in the upcoming school year?
School Health Experts: What support can schools provide to maintain student health and physical activity in the upcoming year?
Discussion topic: recommendations for the future
Teachers: What are your recommendations for how schools can successfully deliver physical education via distance learning?
School Health Experts: What are your recommendations for others to successfully deliver services when schools reopen?

understanding of the topic. Following the interview, participants completed a brief demographic survey. This study was approved by the University of California Los Angeles Institutional Review Board.

Procedure

After obtaining oral consent, interviews were conducted by the principal investigator and/or research assistant via video conferencing from June 9, 2020 to July 31, 2020 and lasted 30-60 minutes. Interviews were audio recorded and notes were taken to document nonverbal communication.

Data Analysis

Audio files were transcribed and reviewed by the research assistant for accuracy. Transcripts were coded in Atlas.Ti, a qualitative data analysis program. Coding occurred in a 3-step process based in the grounded theory approach.¹⁸ First, 2 members of the study team (J.A.V. and R.N.D.) read the transcripts and interview notes sequentially to develop a codebook. Transcripts were coded as the interviews were being completed. During the interview process, the interviewer summarized notes back to the participant to ensure accuracy of understanding. Interview notes were incorporated to develop the codebook and determine thematic saturation. Iterative rounds of open coding were conducted to clarify codes, resolve disagreement, and finalize the codebook. The codebook was finalized after all interviews were coded and major themes and relationships between codes were summarized. Both the major codes and overall findings were discussed with the larger study team which included a school health expert (M.P.) and physical education specialist (J.K.).

RESULTS

In total, 19 interviews were conducted with 15 teachers and 5 school health experts representing 21 school districts in California (Table 2). Participants represented diverse geographic areas and served students in elementary, middle, and high school, from a wide range of socioeconomic backgrounds. Less than or equal to 25% of students received free/reduced lunch in 6 school districts, 26%-50% received free/reduced lunch in 4 districts, 51%-75% received free/reduced lunch in 4 districts and 76%-100% received free/reduced lunch in 7 (Appendix 1). On average, participants were highly experienced with approximately 13 years in their respective positions.

Across all interviews, the following 4 themes emerged: (1) Success is critical and possible; (2) Creating a distance learning environment: personalization, creativity, and inclusiveness; (3) Resources for success: professional development, administrative

Table 2. Participant Characteristics (N = 19)

Category*	Number	Percent (%)
Teachers	15	79
Health experts	5	26
Districts	21	-
Tk-5	12	63
6-8	17	89
9-12	5	26
Avg. years of experience	13	-

*Participants fall into multiple categories.

support, and equipment; (4) Lessons for the long-term. These themes were expressed by all participants and are summarized in Table 3 and described in greater detail below.

Successful Implementation of Online Physical Education is Critical and Possible

Participants perceived physical education as an even more critical component of student curriculum during the COVID-19 pandemic. Physical education supports student health and academic success, delivers health information, and mitigates the effects of the pandemic by supporting physical activity and developing students' social-emotional skills. Teachers and health experts expressed their concern over students' worsening health status during the pandemic due to fewer opportunities for physical activity, particularly for students with overweight, obesity and pre-diabetes, and fewer opportunities for social connectedness. Educators and health experts perceived the movement-based and social-emotional learning targeting by physical education as integral to student health so "they [students] can go on to achieve those big goals they have for themselves because if they don't have their healthy body, they're not going to be able to do all those wonderful things that they have planned for themselves." Social-emotional skill development was perceived to decrease students' feelings of isolation, increase connectedness with friends and teachers, and instill lifelong health habits and fitness practices. Teachers and school health experts encouraged students to "really dive deep into their own reflection of what's going on in their lives and how it [COVID-19 pandemic] has impacted them" and incorporated physical activities to help students understand the connection between movement and their mental health. All participants agreed that high quality physical education was possible via distance learning.

Creating a Learning Environment: Personalization, Creativity, and Inclusiveness

Teachers used a variety of synchronous and asynchronous strategies to teach and assess students.

Table 3. Themes Identified in the Study

Themes	Findings	Sample Quotes
Success is critical and possible	(1) High quality distance learning is necessary	School Health Expert: "I hope that the advocates are in place at the right times to say, No, educating students in physical education is critical." School Health Expert: "Kids are able now to be able to be tested on knowledge, of concepts, of fitness that some teachers were able to do before, and others kind of bypassed because they did not want to come into a classroom." Teacher: "They just need to understand that moving is important. The kids need to move, they are going to learn better."
Creating a learning environment	(1) Personalization: teacher and student created lessons, videos, reflections (2) Creativity: use of technology and resources (3) Inclusiveness: flexible policies and practices	Teacher: "But distance learning offers a really unique opportunity for teachers to provide much more personalized and impactful feedback for students in physical education, in a way that was just never possible before." Teacher: "If you want to have an effective class, you have to be in front of the screen, talking to them, saying their name. You have to be present." School Health Expert: "I know the problems, those are the families where the parents are working multiple jobs and they are essential workers. And the 12-year-old middle school student who comes home all the time, becomes the familial caretaker. And you know what, when you are watching 2 siblings, you do not have time to do distance learning. But it's doing the best you can to get the technology into the home to at least create the opportunity."
Resources for success	(1) Professional development (2) Administrative support (3) Equipment	Teacher: "... using your district's professional development. And learning new strategies as, how can I maybe share my screen and record a video at the same time, or push out lessons where I'm teaching them, and then doing a voiceover on something?" Teacher: "... a feeling of support and the feeling of like that it's a valid subject from the top down, from administrative level, from the board level that it's a valued and important part of the curriculum." Teacher: "They did not all have a jump rope, they did not all have a ball. So, either a barrier to being able to do something at home and not having the equipment or not having the space. So, not having a yard big enough to throw a ball far, that kind of thing."
Lessons for the long term	(1) Lifelong skills (2) Focus on state standards (3) Professional growth	Teacher: "So, I feel like the online physical education, if it's effective and it works well, you implement something for a lifetime as opposed to something that is just while they are younger." School Health Expert: "... it [distance learning] will help us get some of our teachers ... to actually think about the physical education content standards as they teach them." School Health Expert: "So, I think it's making teachers step outside their box and realize there's other ways to do it. And I think they'll continue to do a lot of that as we get back to normal." School Health Expert: "Teachers are stepping up and doing things I never thought they could do before. ... You need to step out and say, "I gotta change. Let me see what other people are doing. Let me learn." There's so many resources out there that teachers can learn from if they are willing to do it."

The perceived best strategies for delivering quality physical education included more personalized lessons to enhance class connectedness; creative use of technology and other resources to modify lesson plans for distance learning; and inclusiveness, allowing for flexible policies and practices to accommodate students' diverse family circumstances and incorporate family members into class activities to increase student engagement.

Many educators felt personalization was a highly effective strategy for engaging students. By sharing student and teacher-created lessons, educators established a virtual relationship with their students and noticed an increase in overall engagement. One teacher noted, "They're [students] going to work harder for people

that they know...and know care about them." To demonstrate their commitment to their student's education and overcome the difficulties of online assessment, teachers delivered personal and timely feedback in the form of emails, comments on online platforms and handwritten letters. Teachers reported that personal attention increased student connectedness and strengthened teacher-student relationships. Finally, participants discussed the importance of incorporating student choice into their lesson plans as a strategy to increase student voice and participation. Offering a menu of learning activities that accommodated diverse space and equipment resources provided students with more opportunities to participate and increased their accessibility to online lessons.

All participants discussed the need to creatively rethink delivery of physical education to meet the state's standards through a distance learning environment. Teachers creatively reworked their lessons, offering movement-based activities that required little to no equipment such as yoga, dance, martial arts, and reflection-based activities that focused on social-emotional learning such as journaling and meditation. Social media platforms such as YouTube, Instagram, and TikTok facilitated the delivery of physical education. An educator described online learning as an experience that allowed educators to “unpack those standards a little more, to provide maybe a little deeper quality instruction.” Online platforms allowed educators to assess student progress and maintain student accountability by encouraging students to upload personal reflections, pictures, and videos.

Remote learning highlighted inequalities in access to resources, such as equipment, technology, and the capacity for families to support distance learning. Participants built inclusive learning environments by providing students with flexibility and designing lessons that could be tailored to a variety of living conditions. In designing their lessons, participants considered student accessibility of space, equipment and technology. Many teachers sought to “provide some resources on things you can do in lieu of weights, common household items.” One teacher stated that “. . . there was a pretty decent percentage of kids who were actually working [i.e. employed] during this whole pandemic,” highlighting the range of student responsibilities in the transition to remote learning. In order to accommodate for a variety of student schedules, teachers created asynchronous lessons. To encourage physical activity and increase student engagement, educators also incorporated family activities in their lesson plans. School health experts perceived family engagement as an unexpected benefit of distance learning and teachers perceived lessons that included family members provided opportunities to extend physical activity beyond classroom time.

Resources for Success: Professional Development, Administrative Support, and Equipment

Due to the rapid transition to distance learning, educators expressed a need for professional development in 2 areas. The first, focus on technology training to increase comfort with technology platforms and virtual teaching. Educators noticed a wide range of comfort with technology among their colleagues, observing that “. . . they've [teachers] either been around a long time and not have really used technology, or they've never learned the skills to be able to create digital content.” The second, delivery of physical education curricula with sample lesson plans based on state

standards. Educators expressed a desire to collaborate and share their ideas with other physical education instructors. Online resources from national physical education organizations were highly valued by educators as a way to learn creative activities, share lesson plans designed for distance learning, and collaborate with other teachers.

Participants felt maintaining physical education through remote learning required support from administration, parents and community members. Student engagement through the upcoming year would be best supported through administrative action including prioritization of class time, fair grading policies, and funding to PE. Educators felt timely and clear expectations regarding student attendance and grading policies would provide clear structure to students. Additionally, space and curricular time dedicated to physical education and guidelines related to mask wearing during exercise, equipment, and locker room would facilitate the delivery of physical education. Teachers agreed “. . . there's a good chance we'll have to be remote at some point . . . so having very clear expectations that these are the requirements and they're high expectations that you [students] will reach this”

The transition to virtual learning has underscored the role of parents in supporting physical education. School health experts emphasized that “they [parents] need agency in this, they need to be informed that they have a significant role, a much more significant role in the success of their students.” Teachers encouraged parents to advocate for the importance of physical education, voice opinions at board meetings and participate in family activities. Educators wanted the opportunity to demonstrate that physical education is more than physical activity. A greater focus on social-emotional learning enabled educators to teach students how to manage their emotions, create interpersonal relationships during social isolation and use movement to improve mental health. Additionally, teachers felt they could be their own advocates through consistent delivery of high-quality instruction.

Teachers felt access to a few pieces of equipment would make the delivery of physical education more accessible in the future, especially with students from lower socioeconomic backgrounds. Low-cost multi-purpose equipment would provide students with a greater range of activities that could be accomplished from home. Equipment donations and free online resources from community organizations during the early stages of the pandemic encouraged participation among students from all socioeconomic backgrounds. However, the limited distribution of community resources, including intermittent restrictions to facilities, memberships to online workout activities, and subscriptions to meditation applications, created

an unsustainable learning environment for many students. Teachers agreed that a collaborative effort between school and community partners would enable the success of distance learning physical education.

Lessons for the Long-Term

Lessons learned from distance learning can be applied long-term. Teachers and school health experts viewed distance learning as an opportunity to restructure their delivery of curriculum content to focus on state standards. Participants witnessed teachers grow beyond their comfort zone to define a new “normal” for physical education. A school health expert stated, “A lot of my teachers have not really incorporated those [physical education standards] into their teaching because they were doing something else for 20 years and it was just a different way of looking at their work.” Online delivery of education encouraged teachers to integrate technology into their teaching and many educators would like to use technology in the future to track student progress, demonstrate exercise form, and reform traditional standards. The integration of physical education practices beyond the school environment, including physical activity, nutrition, and social-emotional learning, was felt to help students establish lifelong health-conscious practices. All participants identified at least one new strategy or tool they planned to continue using after the pandemic.

DISCUSSION

This is the first study to characterize best practices for physical education via distance learning and its connection to student health, as perceived by teachers and school health experts. We found that participants felt optimistic about their ability to provide quality physical education instruction online, given the necessary supports, and perceived that they played an important role in supporting student health during the pandemic. They described many challenges related to re-designing lesson plans, learning new technology, maintaining student engagement, and providing equitable access to education. However, participants also developed successful strategies for building an online learning environment and identified many positive areas of growth. Recent research findings suggest negative impacts to students’ mental and physical health as a result of the COVID-19 pandemic.¹⁹ Health implications include reduced physical activity, irregular sleep patterns, less favorable diets, weight gain, prolonged stress, and social isolation.¹⁹ Schools play an important role in promoting physical activity, nutritional habits, and social interaction, as well as the development of healthy coping skills.⁹ Overwhelmingly, participants in this study expressed a sense of pride in the roles as

physical educators and school health experts and even greater motivation to support student health during the pandemic. Finally, all participants expressed concerns related to equity and the importance of delivering high-quality education to all students, including those with limited access to resources.

The strategies outlined by teachers and school health experts in this study for delivering distance learning are well aligned with general education expert guidelines for online learning during COVID-19.²⁰ Such guidelines include staff preparation and training, student access to books and resources and consensus on grading and assessment.²⁰ Our findings highlight that, while many of these strategies were perceived as applying to all teachers, regardless of content area, participants also felt there was a need for professional development, equipment and resources, and timely and clear expectations specific to physical education.

Teachers and school health experts believe that support for physical education is a collaborative effort. Support from community, parents, and administration were perceived as critical to the success of distance learning physical education. Studies suggest parents have a less optimistic view of online learning versus traditional learning during the COVID-19 pandemic.²¹ Importantly, in this study, teachers felt parents were the most critical advocates for high-quality physical education. Increased parent support was perceived to increase student engagement, help parents and students recognize the value of physical education and establish the continued practice of physical education from home. Others have also cited the critical role parents play in supporting distance learning and student health during the COVID-19 pandemic.²²

Many participating school health experts were also clinicians and/or affiliated with community-based organizations supporting school health. These participants highlighted the important role that communities and resources outside the school might play in addressing child health needs, particularly during the pandemic. Clinicians can serve as a line of communication with parents to help them address the effects of the pandemic on their children’s mental health and encourage family physical activities. Clinicians and community members can also facilitate connections with mental health resources.¹⁹ Participants also suggested community organizations continue to encourage students to do physical activities and increase motivation by providing equipment, technology, and other resources, particularly for low-income students who may not have equitable access to these supports. This strategy is well aligned with the US Centers for Disease Control and Prevention’s Whole School, Whole Community, Whole Child model²³ and the Community Schools movement which emphasize the role of schools as an anchoring institution.²⁴

Finally, many participants expressed frustration with state policies and school district policies that removed requirements related to instructional physical education time, attendance, and grading. While participants recognized that flexibility was critical during this challenging time, they also feared that these changes communicated a lack of administrative support and de-valuing of physical education. Teachers and school health experts suggest administrators provide affordable toolkits for their students, create policies that prioritize physical education instructional time and implement grading policies to increase student engagement.

This study was limited to physical educators and school health experts in public schools throughout the state of California. While we achieved a diverse sample of participants from low, middle and high socioeconomic school districts across California, our findings may not be generalizable to other states or education systems. Although more teachers than school health experts were represented in our sample, our findings were consistent across these groups. Given that the goal of this study was to identify best practices for physical education, the interview guide elicits discussion of successful strategies for supporting physical education and many of our participants were recruited through professional organizations and were nominated by their peers for their excellence in the field. This may limit the likelihood of less favorable discussions about supporting physical education via distance learning. Although parents, administrators and community stakeholders may also have important insights to share and are critical sources of support for delivering online physical education, our findings are limited to the perspectives of school health experts and physical education teachers. Despite these limitations, results from this study can inform strategies to deliver physical education to students from an online learning platform.

IMPLICATIONS FOR SCHOOL HEALTH AND EQUITY

Strategies discussed in this study will help teachers and school health experts support quality physical education, potentially minimizing negative student health impacts of the COVID-19 pandemic. Additionally, supporting student education, participants highlighted the importance of using effective distance learning physical education strategies to increase students' physical activity and provide a safe space for connectedness, social-emotional growth, and reflection. The ability to deliver high quality lessons that promote healthy behaviors requires stakeholder support and appropriate resources. This includes administrative support and making use of community-based assets. Leading organizations for physical education including the Society of Health and Physical Educators (SHAPE) America

and The California Association for Health, Physical Education, Recreation and Dance (CAPHERD) set standards for the physical education curriculum, provide guidance for virtual instruction and assessment and offer professional development tools to educators.²⁵⁻²⁶ At the local level, school districts can collaborate with non-profit and for-profit vendors that provide online instructional and assessment tools. Many educators plan to incorporate the cognitive components of physical education into future hybrid and in-person learning models. Educators can connect with teachers via online platforms created by their school districts and can utilize social media platforms such as Twitter and Facebook to connect with educators outside their network.

In addition, school health practitioners play a critical role in supporting physical education as they often sit at the intersection of physical health, mental health, and school engagement and can facilitate valuable connections with physical education departments and community resources. Collaboration with community partners and afterschool programs to establish schools as community hubs can help connect families with local resources and address community needs.²⁷ Organizations such as Alliance for a Healthier Generation work with schools, community leaders, municipalities, and corporations to implement health-promoting practices including physical education.²⁸ Building a whole school, whole community approach to student health that includes a focus on physical education during and after the COVID-19 pandemic is likely to be even more critical, as students return to campuses with greater needs for physical fitness and social-emotional support in the coming year.

Human Subjects Approval Statement

This study was approved by the University of California Los Angeles Institutional Review Board.

Conflict of Interest

The authors declare no conflicts of interest.

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Appendix 1

N = 19	Grade Levels	School District	Years of Experience	Teacher	Health Expert	% of District Receiving Free/Reduced Lunch
1	6-12	Los Angeles Unified, Santa Monica-Malibu Unified, Culver City Unified, Compton Unified	4		x	Los Angeles Unified: 80.3% Santa Monica-Malibu Unified: 27.0% Culver City Unified: 30.5% Compton Unified: 93.4%
2	6-12	Redlands Unified, Riverside Unified, Alvard Unified	37		x	Redlands: 61.8% Riverside: 64.4% Alvard: 77.3%
3	K-8	San Jose Unified	19	x		42.4%
4	6-8	Alvard Unified	20	x		77.3%
5	4-6	Porterville Unified	2	x		87%
6	7-8	San Dieguito Union High Unified	5	x		10.7%
7	Tk-6	Ukiah Unified	9	x		77.6%
8	K-12	Los Angeles Unified	13		x	80.3%
9	K-8	Palmdale Elementary Unified	11	x		90.4%
10	6-12	Los Angeles Unified	2		x	80.3%
11	tk-4	Woodside Unified	28	x		8.0%
12	4-8	Lammersville Unified	13	x		16.1%
13	6	Poway Unified	6	x		16.4%
14	4-8	Portola Valley Elementary Unified	18	x		6.5%
15	1-6	San Bernardino Unified	6	x	x	88.1%
16	K-12	Long Beach Unified	8	x		65.0%
17	K-5	San Diego Unified	14	x		57.6%
18	7-8	Chino Valley Unified	8	x		47.3%
19	K-8	Rocklin Unified	25	x		17.6%