Technology as Infrastructure for Change: District Leader Understandings of 1:1 Educational Technology Initiatives and Educational Change
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Introduction
1:1 technology initiatives are continuing to grow in popularity as a mechanism to:
• Increase student engagement
• Foment change to pedagogy and instruction
• Increase equity
• Increase student achievement
(Graves & Brown, 2018; Donovan et al., 2016; Harper & Milman, 2016; Milman, 2019; Sauer & McLeod, 2018)

Research Questions
1) How do superintendents and district technology leaders understand and enact 1:1 technology initiatives as educational change?

Methods
Qualitative Phenomenology
Explored the phenomenon of 1:1 technology implementation using an organizational lens
• Conducted two interviews per participant over the course of 6 months
• Four districts in the Northeast, see Table 1
• Interviewed the district technology leader and superintendent in each district because they were the primary decision makers in 1:1 implementation
• Coded using inductive codes from data
(Boyantis, 1998; Charmaz, 2014; Cresswell & Poth, 2018; Moustakas, 1994)

Table 1 District Demographic Information

<table>
<thead>
<tr>
<th>District</th>
<th>No. of Students</th>
<th>No. of Schools</th>
<th>Racial Demographics</th>
<th>1:1 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groverille</td>
<td>5,900</td>
<td>9</td>
<td>85% White</td>
<td>K-12 iPad</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>7% Asian</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>5% Hispanic/Latino</td>
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<td></td>
<td></td>
<td></td>
<td>2% Black</td>
<td></td>
</tr>
<tr>
<td>Norchester</td>
<td>2,600</td>
<td>6</td>
<td>81% White</td>
<td>6th Chromebook</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>9% Hispanic/Latino</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>3% Asian</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>3% Black</td>
<td></td>
</tr>
<tr>
<td>Morton</td>
<td>6,000</td>
<td>12</td>
<td>58% White</td>
<td>6-12 Chromebook</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>14% Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11% Asian</td>
<td></td>
</tr>
<tr>
<td>Oceanside</td>
<td>5,700</td>
<td>13</td>
<td>84% White</td>
<td>6-9 Chromebook</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>7% Hispanic/Latino</td>
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<td>5% Asian</td>
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<td>3% Black</td>
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</tr>
</tbody>
</table>

Findings
In their efforts to create educational change via 1:1 programs, district leaders understood technology as embedded in and changing all four infrastructures.

Physical Infrastructure
1:1 devices changed what classrooms looked like, how students moved around the school building, and how the library and other spaces operated.

Cultural Infrastructure
The 1:1 program inspired change in hiring and staffing practices, school culture, and support structures.

Discussion
• 1:1 technology is present in and changing all four infrastructures and creates opportunity for educational change.
• 1:1 technology can be better understood as an infrastructure that stretches across the other infrastructures.
• This framework offers a new way to think about alignment and power across the educational system.

Implications
• Researchers can apply the 1:1 technology infrastructure to examine the impact and power of 1:1 technology.
• Practitioners can use the 1:1 technology infrastructure framework to approach district change.
• This study provides a novel organization of educational infrastructure literature, as well as the additional infrastructure of 1:1 technology.

Conclusions
The 1:1 program inspired change in hiring and staffing practices, school culture, and support structures. District leaders found that technology is a component of library media science. "People are retiring...I need people that are past the principal and director if you don't know technology. You don't get just principal and director if you don't know anything...I need people that are brought up on it."

School Culture
"The student expectation is that they're going to...use the device...The teachers feel the pressure. They feel the pressure from colleagues and from their students."

Vision
"I think as a leader, I have to help develop a perspective and a context for technology, and then assure that we have access to that in an appropriate way."

Shared Leadership
"The decision-making process is including teachers...I have to look beyond the formal structure of leadership in our school district. So, while the Tech Director is brilliant and so is our Assistant Superintendent, I think I need teachers' hands on this."
References


