The Apple and ConnectED Initiative:

Three Case Stories

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Authors

Andrea Beesley, **SRI International**

Contributing Researchers:
Carrie Allen, Carmen Araoz, Sarah Gerard, Ann House, Mindy Hsiao, Emi Iwatani, Savitha Moorthy, Sierra Noakes, Linda Shear

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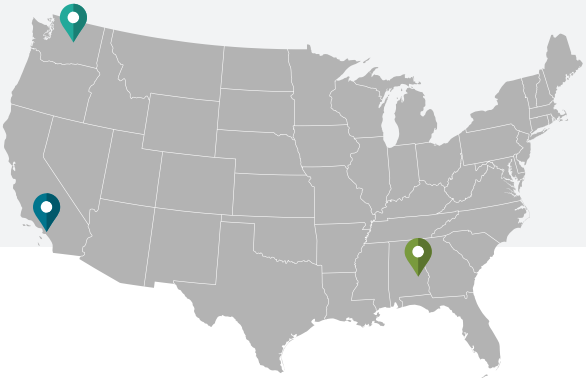


Launched in 2014, the Apple and ConnectED Initiative supported 114 participating schools across the United States. The initiative provided schools with iPad devices for each student, Apple technology for each teacher, and 17 days of teacher professional learning in the first year. In designing the initiative, Apple also included services that are essential, but rare, in widescale technology initiatives: school connectivity infrastructure upgrades and a dedicated team of support professionals that offered project management, tools, and coaching for school leaders. This allowed many of the participating schools to quickly begin to use devices and explore the learning opportunities they could bring to their students. Recognizing the diversity of the participating schools, the initiative also customized both implementation timelines and professional learning approaches to meet the unique needs of each school.

The ConnectED schools ranged from pre-K to secondary and served urban, rural, migrant, and Native American communities. As a requirement to apply to the program, 96% or more of each school's students had to qualify for free or reduced-price meals. The initiative thus offered a unique opportunity to study technology adoption across a wide range of traditionally under-resourced communities.

These case stories describe ConnectED in Compton, California; Tuskegee, Alabama; and Orondo, Washington. They are part of an independent 6-year research study conducted by SRI International that investigates both implementation and outcomes of the Apple and ConnectED Initiative. Fifteen of the 114 schools were selected for site visits from spring 2016 to fall 2017 (wave 1) and then from fall 2018 to spring 2019 (wave 2). The three schools whose stories are presented here were part of that group of 15. Quotes in the stories are from site visit interviews and phone interviews with teachers, principals, and other school staff, unless otherwise noted.

The case stories are intended to give an in-depth look at each school's setting and the details of how ConnectED unfolded in each place. We hope that readers who are implementing a 1:1 device program will find something that resonates with their own schools in each story, and benefit from leaning about their experiences. Each case story includes background on the school and community context, the school's goals for ConnectED, how the iPad devices were integrated into instruction, and factors in program sustainability. They also include aspects of ConnectED that were particular to each school, including the role of iPad devices in afterschool programs, differentiating both teacher and student learning, parent and community involvement, and fostering creativity.

The site visits to prepare for the case stories ended in spring 2019. In spring 2020, the COVID-19 pandemic caused schools to shut down and then resume in a virtual format. The case story epilogue, based on interviews conducted in 2021, explores how these schools coped with emergency online instruction and how they sustained their programs.

Thomas Jefferson PreK-8 School

Compton, California

Thomas Jefferson PreK–8 School in Compton, California had a student population of 837 in 2019. It is located in a generally working-class, inner suburb of Los Angeles. Families live primarily in single-family homes, many of which did not have home internet access when ConnectED began. The community is close-knit. Many extended families live close to one another—"that embracing environment where everyone knows each other"—and to the school, to which many students can walk.

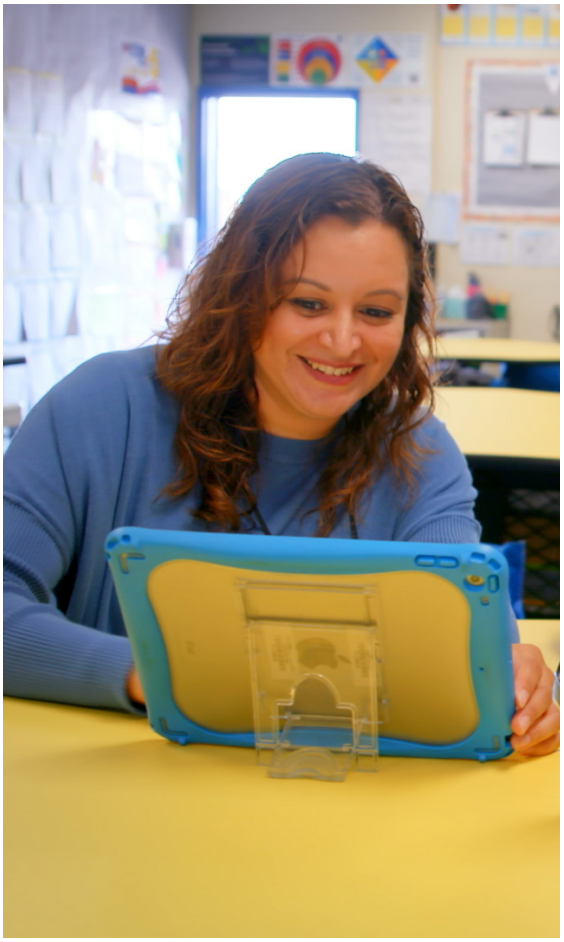
As with all ConnectED schools, most students are eligible for free or reduced-price meals. Classes at Jefferson start at a time that allows students to eat breakfast when they get to school. Two out of every five students are classified as English Learners, a percentage that has been declining over the years as students eventually get reclassified and the area population changes. A district school, Jefferson competes for students with charter schools in the area—successfully, as its enrollment numbers have been rising. Jefferson was named as one of the top public schools in its county for several years.

Jefferson and its district are focused on technology-enhanced science, technology, engineering, the arts, and mathematics (STEAM) learning. Jefferson was the first school in the district to join Project Lead the Way, which supports innovative experiences in computer science, engineering, and biomedical science. The Girls Who Code program is offered afterschool for students. Each year there's a highly competitive districtwide STEAMFest. Four other district schools participated in ConnectED, and others participate in other device programs such that all middle schools are 1:1 technology schools. The district budgets to refresh devices regularly so that schools have current operating systems and software.

Teacher turnover at Jefferson is low. The principal attributed this to creating a trusting, supportive culture at school in which teachers feel comfortable supporting one another and to teachers being able to see their students' progress.

Differentiated Professional Learning

Teachers at Jefferson received their Apple devices in summer 2015 and students received theirs in January 2016, to allow time for teacher professional learning. Apple conducted a needs assessment to plan differentiated learning opportunities for faculty because teachers entered the initiative at different levels of prior experience. Teachers appreciated that the professional learning they received helped them feel more confident about the 1:1 program: "You think, 'I could do that!' It's great." The principal worked with Apple to align the vision for ConnectED with the school's vision for greater creativity and innovation, so Apple's professional learning staff would help teachers and students achieve it. The Apple Professional Learning Specialists provided engaging experiences: "They're hands-on. It's not just, you're just sitting here…just watching someone do it." The Professional Learning Specialists "helped in the classroom" while teachers also visited one another's classrooms to see the iPad devices in action—a "hands-on and collaborative" approach. In this way, Jefferson benefited from expertise outside of the building while building capacity to sustain professional learning within the building.



Integrating iPad Devices

Once students had devices, they were quickly integrated into instruction. Teachers spoke of mastering increasingly more complex applications of the iPad devices: “You can’t just stay in one spot and say, ‘Oh, we mastered it all’…We need to keep going.” With the affordances of the iPad devices for doing research and contacting experts, teachers were willing to step outside of their comfort zones and allow student interest to guide learning. For example, a teacher found that their students wanted to study single-use plastics at school: “This group was so excited. They’re like, ‘Can you believe that in the cafeteria we use this much plastic?’… Let’s jump. Let’s run with this and move forward.” The iPad devices were used to connect students to information and provide students with innovative opportunities and formats for communication, often to authentic audiences such as parents and community members.

Jefferson’s location allowed staff to take advantage of opportunities offered by Apple stores such as teacher learning and student field trips. The school also participated in the Everyone Can Create and Everyone Can Code initiatives, which also involved families and the community. Many teachers joined Apple Teacher, a free online professional learning program, and the school and the school became an Apple Distinguished School in recognition of their widespread integration and innovative use of Apple technologies in teaching and learning.

Goals for ConnectED

The principal established clear goals and measures for ConnectED from the beginning: support students as creators and innovators rather than just users of the technology, increase student engagement and attendance, increase the comfort of the teachers with technology, and scaffold teachers’ use of “purposeful technology,” meaning learning strategies enhanced with technology: “Great, we have the technology, but what are the strategies that we’re using with that?” Ultimately Jefferson wanted its students to be ready for a technological future.

At Jefferson, the focus was on all students moving forward with ConnectED: “We continue to push our students to achieve the highest expectations, and we expect that of all of our students, not just some of them. When we offer programs, we offer it to all our students. We don’t select just this group of kids or just this group….That’s one of the things that sets us at the top…Yes, they have different needs, and we meet those needs.”

A key strategy for Jefferson to check on the progress toward ConnectED goals was establishing an evaluation plan. Data sources included surveys and needs assessments with students, staff, and parents; attendance records; English Language Arts and mathematics scores; and the rate of reclassification of English Learners. The principal and teachers analyzed strengths and areas for development each year so they could continue to move forward.

More Efficient Differentiation

Teachers at Jefferson emphasized their increased ability with iPad devices to individualize instruction and to differentiate content and scaffold based on the needs of particular students.

> It was so hard to differentiate before…I felt very limited, very constricted, whereas now it's all these possibilities. How do I narrow it down to figure out what I need?… This is where now my creativity comes out. It's how can I create these lessons that are engaging, but also getting to the point.

With the 1:1 program, students weren't embarrassed when they needed extra support because the iPad devices offered some privacy: "I think it helps that they're 1:1 because it's not like, 'Everybody's looking at what I'm doing,' like, 'I'm still working on multiplication.' There's no shame I guess." Students who needed math manipulatives could access them privately online and the teacher didn't have to worry about bringing in items like Legos or jellybeans. Students noticed opportunities for differentiation with the iPad devices: "[The teacher] could elaborate, oh, who needs help? Who does not? The people who do need help, she will post the [information] and reteach it to them."

New Opportunities for Student Collaboration

Students at Jefferson appreciated that iPad devices made collaboration work better: "With the iPads, now, we could all put our ideas together. We could type it up and make it easier." In keeping with their approach to purposeful technology, teachers realized that iPad-facilitated collaboration also needed some scaffolding: "It takes a little while to get them to actually collaborate and listen to each other and work together… 'You should all be working. You should all be providing feedback'…They are getting used to doing that."

Critical Thinking and Communication

Students were using the iPad devices to support higher-order skills, such as critical thinking and communication, in real-world settings. Classroom activities required students to use iPad devices for addressing issues at their school such as measuring the soccer field and determining the cost to convert it to a football field. In many cases, students were required to share final presentations

or products with an audience beyond their teacher and to attend to differences between those audiences: “My group is making a Keynote to present to [the principal] and the lunch people [so] they could change the stuff at the cafeteria because they’re using a lot of plastic. Other people are making fliers and posters, and some are making art out of the plastic to reuse them, too.”

Parent and Community Involvement

Jefferson intentionally involved parents in their implementation of ConnectED. For example, the school held monthly literacy and math workshops for parents. Staff at the events show them, for example, how to use apps to help English Learners read and learn vocabulary, including how to use a glossary and play word pronunciation games. Some teachers work with parents to use a vocabulary card app to use at home. At the district level, students in grades 7 and 8 collected data from students, teachers, and parents about literacy practices and discovered that students in lower grades were not engaging in literacy activities for fun. To respond to that, they participated in a community literacy challenge, prototyping Apple apps to help promote literacy among the younger grades.

Teachers and students created videos with iMovie to present the weekly strategies for Positive Behavior Interventions and Supports, a framework to support positive student outcomes. Both students and parents can view the videos: “It’s more effective rather than the poster in the class. It’s more effective for the student because they go, ‘Oh, that’s my classmates.’”

Although teachers previously used apps to connect with parents, a teacher said, “The iPads just make it easy to send the parent a message or let them know what’s going on.” A parent described it this way: “I do see the progress….I can check with my phone what they’re doing, what they finished, and I can contact the teacher. It is easier than waiting to find out the next day if they did it right or not. At that moment, I can speak to the teacher or he can send me the task he’ll assign.” Teachers communicating with Spanish-speaking parents also used translation tools and Spanish dictionaries on the iPad devices to make sure that notes were correct. Along with the messages, teachers could link to reading quizzes and eBooks, extending the paper-based holdings of the schools’ library.

Parents and teachers noted that participating in the 1:1 ConnectED program had raised the profile of the school and district in the local community because wealthier and better-funded school systems nearby lacked the technology and support that Jefferson and its district had. A parent said, “I keep my kid here because of…the iPad thing and they have more resources, more help, more people involved. A lot more parents involved also. There’s more involvement altogether versus other schools….They don’t have what we have.”

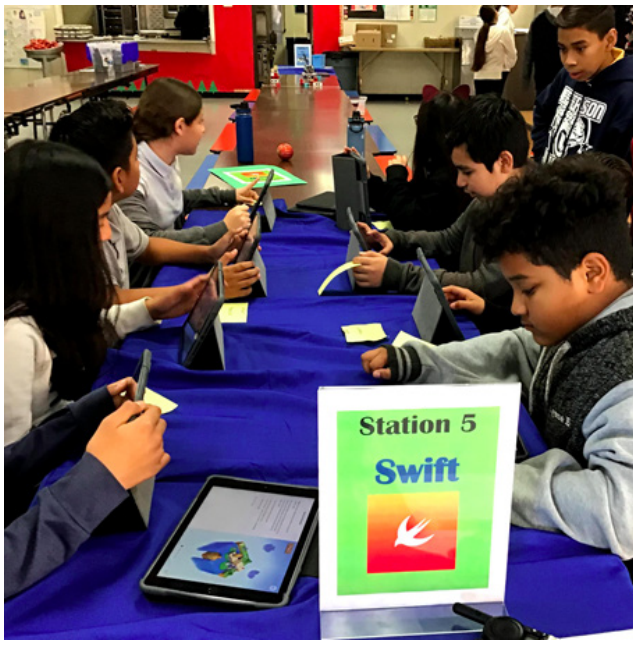
Potentially Promising Outcomes

When Jefferson staff reviewed the data they collected to evaluate the outcomes of ConnectED, the school administration noted increased attendance: "As far as student engagement, attendance has drastically increased. Our chronic absenteeism rate is definitely low. In fact, we're leading the district." The principal also reported that the students' English Language Arts and math scores had been increasing, and their English Learners were increasingly being reclassified as proficient in English.

Sustaining ConnectED

Sustaining 1:1 programs in ConnectED schools started from a broad commitment to the strategy and vision, which provided direction for activities and instructional strategies. These conditions enabled changes in teaching practices and visible benefits for students and families. Jefferson also devised practical plans for maintaining the program, such as providing ongoing professional learning.

The district's commitment to 1:1 technology in all middle schools is likely to lead to resources that ensure students continue to have access to the latest software and operating systems over time. Jefferson's status as an Apple Distinguished School signals a commitment to using technology that extends beyond the years of direct support from ConnectED.



Jefferson had a school leadership team that facilitated in-house professional learning opportunities for teachers at the school, including those for integrating technology and using iPad devices. New teachers also attended a summer boot camp to come up to speed. At the time of this study, Jefferson's district had not focused on organizing opportunities for teachers and administrators to learn from one another. Setting up such a cross-school community was a high priority for the coming year. Jefferson's principal mentioned that it would be important in the future to connect to a community of other ConnectED schools to see what they are doing and share practices and knowledge.

Tuskegee Public School

Tuskegee, Alabama

Tuskegee Public School in Alabama serves students in grades 4–6. It is situated in a small, southern college town in an area significant to African American history. The school and its surrounding families are close-knit. Many of the teachers are locals, even graduates, and the principal is a well-known pillar of the community; turnover is relatively low. As with all ConnectED schools, nearly 100% of the students receive free or reduced-price meals. Some students are from families experiencing homelessness or live in homes without functioning utility services. Access to the internet at home is a challenge, so students connect to Wi-Fi at the mayor's office or McDonalds. The nearest sizable city is an hour away.

Goals for ConnectED

With ConnectED, Tuskegee staff wanted to provide students with opportunities to build 21st century skills, meet standards, and explore their interests more. As one teacher said, "[Our goals are to make] children leaders of their own learning. I want to see what they latch onto." The principal wanted teachers

to go beyond assigning worksheets to redefining lessons so that students can be more creative, writing and illustrating their own stories, and making presentations and videos: “I really would like for students to have a digital portfolio when they leave here of things that they have created whether it’s an online journal [or] math projects.” Overall, the Tuskegee educators wanted students to be more prepared for life outside of their small community and believed that ConnectED would help accomplish that.

Professional Learning

Tuskegee received their iPad devices in August 2015 with a mixture of excitement and concern. Some teachers left when the devices arrived because they couldn’t see themselves incorporating the 1:1 device approach into their teaching practice. Others were excited about incorporating technology but were unfamiliar with the iPad and MacBook.

At Tuskegee, the 17 days of professional learning Apple provided were important to getting teachers ready to implement ConnectED: “I think what’s supported me was really the 17 days of professional development and having…[the Apple professional learning staff] come in and showing me different things, getting advice from them.” Once teachers had had the professional learning within their building, they began attending other Apple events and connecting with other ConnectED schools to see how they were implementing the initiative. The teachers also began to share more strategies for teaching with technology with one another: “We learned so much…Then teachers would start discovering things, and then teachers would start to share things at faculty meetings.” Faculty were also able to reach out to the Apple professional learning staff whenever they needed help.

Integrating iPad Devices

The principal signaled a total changeover to the ConnectED Apple devices by ensuring they replaced older devices in use in the school and asking for files to be created exclusively in Apple apps such as Pages and Keynote. The principal also provided key documents, such as handbooks, only as iBooks. According to the principal, this approach worked: “Now teachers are not afraid. My goal was to get teachers fluent with the technology so they would introduce it to the students.” The principal also took the lead in creating with Apple apps that were new to the school: “I got in GarageBand one day and just recorded a rap song, our school rap song. I ended up taking that and saving it and giving it to the local DJ. We just went from there. Then the kids started seeing what I was doing, and the kids started getting on GarageBand.”

Teachers guided the students to use iPad devices throughout the school day. For example, “We use them as journals. They learn how to create their graphs and put in charts for collecting their data… Numbers is used a lot in my classroom. They also create their own Keynote presentations….They use ShowMe to solve problems and to tell how to solve a problem…They make iMovies based on their science experiments.”

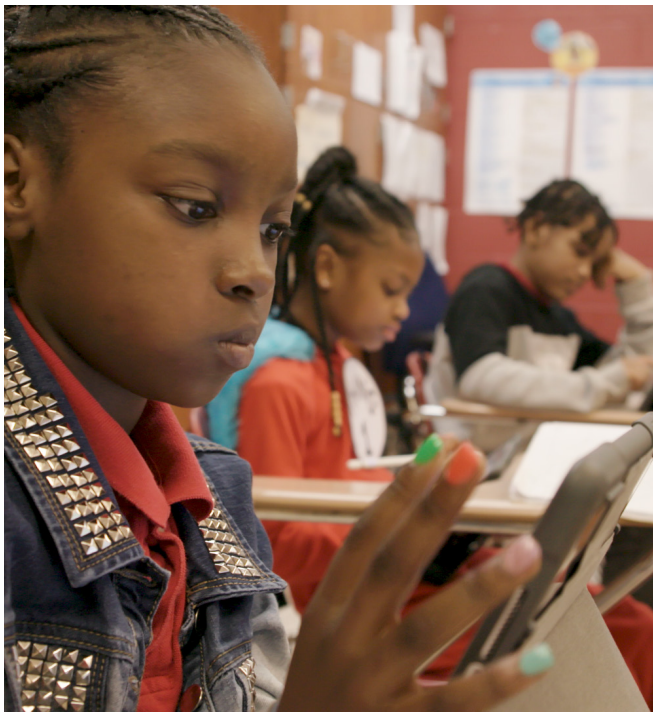
Tuskegee teachers who took a more traditional skill-based teaching style maintained that approach, but in a way that was more fun for students: “Because they’re more engaged. They want to do it. Before, they weren’t eager to use paper and pencil. When I say, ‘Take out the iPads. Let’s do this,’ then they’re eager learners.” Teachers noticed that individual activities could be done more efficiently, making it easier to build in larger projects. For example, in the time that used to be dedicated just to spelling worksheets, the students could instead begin a story with the spelling words, turn it into a virtual book, add illustrations, and animate it into a cartoon or use it in a movie—“You can build on top of anything and make something happen.”

Understanding Student Learning Faster

Teachers appreciated how apps on iPad devices gave them instant feedback on students’ mastery of skills in the classroom. At Tuskegee, teachers used iPad devices for exit tickets, which provided an opportunity for students to ask for help if they didn’t understand the day’s lesson but also didn’t want to openly ask for help during class. When students did need extra help, teachers used the iPad devices to assign individual or small-group work to support them in catching up, while the other students did practice or enrichment activities: “If you noticed yesterday, I had my small group, and I worked with the ones that I knew were struggling with that skill that I was working on yesterday. Well, then, I had another group working with their…book creator where they were working on their vocabulary.”

With the iPad devices, Tuskegee students who were reluctant to speak in class were able to express what they were learning in new ways: “I’ve seen students that I thought could not speak get in front of a camera, get in front of the iPad and become a totally different person…It’s amazing how this technology can bring out different talents in children that you otherwise would never see…I never knew that this device could spark so much in a group of people.” Teachers described previously quiet students who were comfortable doing news reports with the iPad devices, using GarageBand to compose music, or star in iMovie productions. In this way, teachers became more aware of students’ abilities and potential.

The principal noted improvement in student outcomes, such as reading and mathematics benchmark achievement, and attributed some of those gains to the iPad initiative and the ability to get more immediate feedback on student learning.



iPad Devices and Independent Learners

Students at Tuskegee realized that they could do more on their own with the iPad devices. Teachers said that students are therefore less reliant on them for answers: "They're not dependent upon the teacher. Not only that, they want to become independent. They want to do it by themselves. They're not relying on me as much." Instead of expecting teachers to supply answers, students are "able to create problems and then solve and show how you get the answer….They have to figure and also explain in their own words—in their own way sometimes. I like that. That's independent to me."

iPad Devices Shining after School

iPad devices were consistently used in the Tuskegee 21st Century Community Learning Center afterschool program for high-impact, high-value extracurricular activities. Afterschool students could audition for a 15-person Green-Screen Team that recorded news broadcasts, plays, and other performances. The team was good for students who are outgoing and also for those who need team support to overcome shyness in front of the camera. Other teammates focused on editing, research, and graphic design. The Green-Screen Team used iPad devices to conduct audio and video oral history interviews with local veterans, which they put on a website. An afterschool chess club began with chess on the iPad and brought in community members including the mayor and the sheriff to play. The chess games moved out into the community, to barbershops and the municipal center where seniors volunteered to play. Using the iPad devices, after-school faculty were able to get students to do things they thought they couldn't do: "You have to believe, first. You have to believe."

Having the 1:1 devices provided an opportunity for Tuskegee students to connect with local university students after school and on Saturdays. Engineering undergraduates introduced the students to coding. A monthly Science Saturday Academy involved faculty and students in biology doing science activities with students and parents, using iPad devices to record data. ConnectED helped bring the school and community together through these informal learning opportunities and exposed students to potential role models at the university.

Sustainability Factors

An indicator of successful transformation in a 1:1 device program is sustaining it beyond the first few years. Tuskegee staff are building a foundation to sustain ConnectED through committing to their technology strategy and including and benefiting both the school and the community. At the same time, Tuskegee staff were concerned about onboarding the new fourth graders who came from an early elementary without 1:1 technology, as they tended to be less careful about how they treated the devices. They knew they needed to devise a plan for longer-term maintenance: "Eventually software becomes outdated. Will we be able to replace or update what we have? Will we be able to keep up, and how will we do that?"

School leaders' intense focus on maintaining ConnectED was crucial to sustainability because it keeps ConnectED at the top of the list of many priorities principals deal with. The Tuskegee principal first took the risk to publicly use and create with the technology, thus setting an inspiring example for teachers. Along with that, the principal set expectations for teachers—using Apple apps throughout the school day, incorporating more engaging approaches to student participation—that they could understand and meet. The principal also checked in with teachers frequently on their use of the iPad devices, providing both support and accountability.

District-level support can provide the infrastructure and continuity that helps a 1:1 program survive. Tuskegee's district was putting iPad devices throughout schools, "so the students will have the exposure when they come through the different schools." This began with the middle school, as ConnectED students left grade 6 at Tuskegee and headed there afterward, and then they would extend to the high school and eventually the early elementary school.

When the benefits of a 1:1 program extend beyond the school building, parents and community members are likely to lend their support to sustainability because they see visible benefits. Efforts by the school to include the broader community included allowing community members to use MacBook computers after school or during the summer. As mentioned previously, the afterschool and Saturday programs brought key community stakeholders such as veterans and university students into Tuskegee for iPad device-supported activities. These programs bring knowledge of how to use technology for interesting real-world learning purposes, as well as positive attention to the school.

Orondo Elementary and Middle School

Orondo, Washington

Orondo Elementary and Middle School is in a small rural town of the same name, perched alongside the Columbia River in the Pacific Northwest. The area is known for its robust agriculture, producing cherries, apples, and pears. Fruit stands line the roads and there's a golf resort nearby.

Most families in the area work in agriculture and have longstanding ties to the community. As with all ConnectED schools, nearly 100% of the students receive free or reduced-price meals. Access to the internet at home is a challenge, and many students live in settings where it is difficult to find quiet places to study and do homework. The students who attend the school largely come from Spanish-speaking households where the parents may or may not speak English and where parents are not available to supervise homework. Therefore Orondo assigns minimal homework.

Orondo is the only school in its district. It is the center of the community, with a warm and inviting atmosphere. There is relatively little staff turnover at the school; several teachers have been there for 12 to 25 years. Most teachers at the school take on additional functions such as coaching sports or serving on committees. The superintendent/principal likewise has many functions at the school, including serving as the director of federal grants and managing additional programs

and departments. The school functions as a community hub, connecting parents and students to resources such as mobile dental services, mobile food banks, or the Catholic charity that offers counseling services to students onsite once a week. (Orondo itself does not have a counselor.)

Goals for the Apple and ConnectED program

Orondo wanted students to "get the best things" and feel more engaged and empowered when learning with iPad devices: "Excited, and smiling, and happy, and proud, and able to be independent on them, and willing to take risks." The school's focus was on developing a growth mindset in their students and fostering "quality talk" between students. Because Orondo had moved toward standards-based instruction and grading rather than using a set curriculum, the staff and leadership hoped that the 1:1 iPad model would help them access necessary materials.

Integrating iPad Devices

Orondo received their teacher devices in February 2016 and the student devices that April. The school had a small number of iPad devices before ConnectED as the result of another grant, so teachers had some familiarity with them. The Apple technology quickly became an integral part of teachers' instruction at the school: "You will very rarely see a textbook being used." Teachers noted that students took to the iPad devices right away: "The kids, they blow me away with what they know and how fast they pick it up." The shift to standards-based instruction, in which teachers selected materials that would best support students, was further leveraged by ConnectED because both teachers and students needed access to a wide variety of educational resources.

Innovative Instruction with iPads

Similar to other ConnectED schools, the iPad devices were initially substituted for other technologies: physical books during independent reading in elementary grades or as video recorders for middle school science experiments. Orondo staff then developed more innovative approaches to using the technology. For example, a robotics class used iPad devices for game design, with the teacher designing their own game right beside the students to demonstrate a growth mindset and normalize struggle as part of the learning process. Elementary students worked with robots as well: students programmed one to move in a square, make an animal noise, and speak, for example. Students presented their robots' programming to the class. They each took turns working with the robots and, as audience members, scoring each other's work based on a rubric. At the end of the lesson, they wrote a paragraph about which robot presentation they liked most and why. During the presentations, an older student yearbook staffer used her iPad device to take pictures.

More Confident Speakers

Improving the quantity and quality of student talk using iPad devices was important to Orondo—hearing student voices more often in the classroom and improving verbal language skills. Teachers took advantage of the features of the iPad devices both to read text aloud and to capture student speech in written text. Speech-to-text helped students who were new to writing and keyboarding get past being anxious over a blank page.

> The ability to show students how they can speak and their writing comes to life in Pages….Now our job is to go back and organize it, revise it, edit it. It's making the process…just more engaging and it's more efficient.

For English Language Learners, translation tools and text-to-speech apps made mastering a new language more welcoming. iPad devices even helped students who were severely resistant to talking in class. With the iPad devices, these students were able to record their narrative voiceovers while doing math problems, for example, which they never could have done if they were speaking to another person. Teachers saw these students as expressing a voice that was hidden or guarded before.

Better Access to Student Thinking, and "Quiet" Differentiation

The audio record and playback abilities of the iPad devices allowed students to share their thinking in ways that supported formative assessment—teachers' understanding their students' learning and providing responsive instruction.

> The students pick the problem they want to do, and then they explain how they are doing it, and then they submit [the recordings]. I can sit on my couch and listen to those and see exactly where their "holes" are.

They then could respond to each student's specific needs since they were able to find out the needs without the student feeling embarrassed: "In math centers, the next day, we can [work on it]… Whereas kids would never share that out in a classroom setting." This "quiet" and private form of differentiation was a major theme of Orondo's iPad integration.

> It's been a lot easier to personalize learning—to get learning out to different students at different levels in a way that none's the wiser. So, if you've got multiple levels in your classroom, you can kind of hide some of that and disguise it through the tech.
>
> The teacher can rotate and work with different groups on different things, and feel that each group is getting the appropriate level of difficulty and challenge.

In a small school in which students are "academically all over the map" within each class, easier differentiation was key to meeting all students' needs. Teachers were also able to use their Apple devices to easily look up the standard they were working on, along with the preceding and following standards, to provide additional support or acceleration depending on how students were doing.

Fostering Creativity

At Orondo, teachers and school leadership saw the iPad devices as fostering students' creativity and interests because students had more ways to demonstrate their ideas. With the iPad from the Apple and ConnectED program, teachers were able to offer students multiple ways of completing assignments: "You can create a Keynote, a Clips, an iMovie…they'd all have the same rubric and the same criteria, and I give them more of the choice of how they want to show it." Having all these options led to more expressive student work.

> Before,…the projects looked the same. As soon as they saw a poster on somebody else's table, then I would get 20 posters that looked almost identical because they saw somebody else doing a really good thing… Now they're still sharing ideas and themes, but they're kind of in their own little world, and so I get to see their thinking, their thoughts, their creativity way more than I used to.

Easy access to new resources and information has contributed to students' ability to be creative, according to teachers. Living in a small, rural town, students have taken advantage of the 1:1 technology to experience places, cultures, and ideas that they might not otherwise.

> I think for our kids, they don't have the life experiences that a lot of us adults have had and continue to have. "Let's take a look at the largest volcano in the world!" "You don't know where the Nile is? Let's go find it."

Sustainability Factors

Orondo staff are building a foundation to sustain the technology through continuing professional learning, planning for continued device use, and committing to their technology strategy.

Orondo has a School Improvement Plan team that meets regularly to discuss current and emerging issues, including the next steps for their 1:1 iPad program. The SIP team is one way in which responsibility for maintaining the program is distributed across key leaders, rather than being concentrated in one individual such as the principal. Such leadership concentration would be vulnerable to principal turnover or fatigue from leading the program alone. In a distributed leadership approach at Orondo, for example, one faculty member has the responsibility to review new apps that might be purchased for the school—vetting the app in terms of content and cost and providing a

review of the app to the SIP team. SIP meetings likewise provided teachers and administrators the opportunity to discuss instructional strategies for using the 1:1 devices and ways to share lessons learned between experienced and less-experienced faculty adopters. Teachers are empowered to learn from others at the school about new strategies and approaches for how to use the iPad devices more effectively. Integral to this approach was a combination of setting clear expectations for teachers and then providing them with plenty of time and support: "It's not okay to do nothing, but it's okay to watch others and ask questions. You have to be moving and you need to know at some point there will be an expectation."

Lacking the continuity of having the devices at home was a big concern for Orondo staff, especially as a home-broadband grant ended.

> Last year the kids were taking their iPads home because we had that coverage for service.

However, to keep the 1:1 devices running, Orondo shifted the responsibilities of a staff member to fill the role of technology coordinator who keeps them all in use, updated, and in good shape.

> We constantly have iPads on backup….Some of the original iPads we bought before the grant are now document cameras. We have some iPads on reserve. I feel like if a new kid comes, within a day, they're set up and ready to go, easily.

Orondo was so transformed by participating in the Apple and ConnectED program that continuing it became a top priority: "I never see the school losing the 1:1. I think that would be not okay with a lot of staff." That attitude—continuing 1:1 iPad device use no matter what—has emerged as a key support to sustainability because it keeps the program at the top of the priority list, no matter what else is happening.

> We just need to be really smart with the financial end of it moving forward and make sure that we can continue to keep these….There's no way we can go away from being a tech school. There's no way. We'll have complete revolt from staff and students alike.

Epilogue: ConnectED Schools During COVID-19

In mid-March 2020, most schools in the United States, including ConnectED schools, closed for in-person learning because of the COVID-19 pandemic. What initially followed was emergency remote instruction, followed by more long-term virtual and/or hybrid learning. SRI researchers interviewed leaders from each of the case story schools in June 2021 to see how they fared during the pandemic and what role ConnectED played in that.

Technology Use and ConnectED

Because Apple and ConnectED schools already had 1:1 iPad devices for each student, they didn't have to wait for devices to be located to give students when schools closed. When the pandemic started, none of the three case story schools had a regular take-home device policy, so there was some initial concern about how well sending them home would work. There were a few initial challenges—for example, some families used the wrong chargers until they got the right ones. But in all three schools, checking out iPad devices and accessories such as keyboards and headphones worked out well. Families took care of the technology. The pandemic also made new funding available to address the widespread challenge of at-home internet access, which had been lacking before. Now families were provided with Wi-Fi hotspots.

Leaders at all three schools said that students were able to transition to remote instruction with relative ease because they were already familiar with using the iPad devices. They knew how to FaceTime and use videoconferencing for whole and small group instruction, and they already had the apps they needed installed. Otherwise, a Tuskegee school leader said, "We would not have had anything for students…it would not have been in the hands of every child without [Apple and] ConnectED."

Teaching and Learning Remotely

As with the students, Apple and ConnectED teachers adapted rather quickly to remote instruction because they already had the Apple devices and experience with educational technology. Instruction was a mix of familiar and new practices. At Orondo, school leadership asked teachers to use their professional judgment in moving through the curriculum in this new setting and encouraged focusing on social-emotional learning and self-care. At Jefferson, faculty continued with engaging activities like coding and engineering with Project Lead the Way, as well as their academic pentathlon and robotics activities, now via kits.

Some students had initial difficulty adapting to working remotely rather than face to face. They consistently needed support in logging on and attending. At Tuskegee, educators were able to address a lot of issues through their virtual afterschool program, which involved more training and outreach to struggling students.

Although the three schools had low teacher turnover during the pandemic, they still had some new staff who needed onboarding. The faculty brought new colleagues up to speed through a variety of strategies: bringing in trainers, arranging "tech walks" where teachers share practices with one another, and arranging training with their ed tech departments. Veteran faculty continued to rely on the professional learning provided by Apple in the ConnectED program. As an Orondo leader said, "It was what we did for the previous 5 years, not what we did in the moment." With their peer training, Orondo faculty emphasized how important it was to embrace vulnerability and demonstrate it to students—to try new things, help one another accord to one's strengths, learn together, sometimes fail, and yet go on.

Involving Parents, Retaining Students

Each school faced the challenge of retaining students during the pandemic, when students' home lives were also upended by the crisis. At Orondo, that meant school leaders making 175 home visits. These visits, common even before the pandemic, set an expectation of closeness between school and families and a culture of attendance. During the visits, school leaders work to solve any barrier to attendance such as setting an alarm to get up in time for school. At Tuskegee, parents saw how dedicated teachers were to continuing instruction during the pandemic, even teaching from quarantine or the hospital if they'd been exposed to the virus. With outreach from faculty and school leadership, parents became more in tune with what students were doing and supportive of their students' continued attendance. At Jefferson, school leaders also made home visits, sent social media messages, and phoned to find students who weren't logging in to remote instruction. Students with consistent attendance got certificates and small prizes. School leaders at Tuskegee and Jefferson also held a parent workshop on how to use educational apps, monitor their children's progress, and check their grades online. Orondo sent home videos and interactive readings that parents and students could do together. Their virtual parent communication was so successful, in part because it could incorporate language translation, that it replaced traditional conferences. As in-person instruction returns, they will keep these new communication strategies in place.

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Silicon Valley
(SRI International headquarters)
333 Ravenswood Avenue
Menlo Park, CA 94025
+1.650.859.2000
education@sri.com

Washington, D.C.
1100 Wilson Boulevard, Suite 2800
Arlington, VA 22209
+1.703.524.2053

www.sri.com/education

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