The Apple and ConnectED Initiative: Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys

Executive Summary

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Introduction

Launched in 2014, the Apple and ConnectED initiative represents a substantial corporate investment in the goal of improving opportunities, in learning and in life, for students in some of the most underserved communities in the country. While the potential of technology to help prepare students for the future is widely celebrated, persistent gaps in the frequency and character of its use in low-income schools threaten to exacerbate existing academic inequalities. The initiative seeks to address this issue by bringing not just technology but also comprehensive support that includes planning, professional learning, and ongoing guidance to 114 underserved schools across the nation. The goal is to promote more personalized and student-centered educational experiences that support critical thinking and conceptual understanding and, in turn, improve learning outcomes for students.

This report is the first in a series from a rigorous evaluation of the Apple and ConnectED initiative conducted by SRI International (SRI). The full study combines surveys, case studies, achievement data, and examination of learning opportunities to offer a well-rounded picture of what it takes to leverage technology to dramatically improve learning opportunities, particularly in schools and communities that have had limited access to equitable opportunities in the past. The current report summarizes results from surveys of teachers, school leaders, and students in the first two years of the initiative.

The Apple and ConnectED initiative offers an unparalleled testbed for such a study. The initiative required that schools have a minimum of 96% students who quality for free and reduced lunch in order to apply, ensuring the initiative reached schools serving economically disadvantaged populations; school selection was also based on demonstration of strong leadership capacity and a compelling school vision. Apple sought to leverage insights from decades of experience bringing technology to classrooms to design a suite of offerings that would give the selected schools the support they needed to reach their goals for the students. This comprehensive initiative includes devices (including an iPad for every student and an iPad and MacBook for every teacher); infrastructure upgrades; a dedicated team to provide sustained support for leadership development, teacher professional learning, technology and project management; and access to an ecosystem of apps and other digital learning resources. Recognizing the diversity of the participating schools, the initiative customized both implementation

timelines and support to meet the unique needs of each school setting.

Overall, a total of 114 schools are participating in the initiative, including 72% elementary, 12% middle, 10% high schools, and 6% that span these grade ranges. These schools are geographically and demographically diverse and serve a wide range of disadvantaged communities. Compared with other high-poverty schools, these schools experienced roughly similar rates of principal turnover (approximately 41% over two years), but they had higher-than-average numbers of new teachers (approximately 22% of teachers had less than 4 years of experience). Technology access was often limited within the communities served by these schools, with 55% of principals estimating in 2015 that at least 75% of their students lacked home access to the internet.

This report focuses on data from principal, teacher, and student surveys. To date, two rounds of principal surveys (spring 2015, spring 2017) and teacher surveys (fall 2015, spring 2017) have been conducted in 101 participating schools. In addition, 13 schools participated in a student survey (winter of 2016-17 school year). Because schools received their technology according to their readiness rather than all at once, at the time of the spring 2017 teacher and principal surveys participating schools had been using their Apple resources between 5 and 17 months; at the time of the student survey, between 3 and 17 months. This variation in time spent with the devices is important, as the findings reported here are averaged across this range of schools and thus reflect different amounts of time and maturity for the technology integration.

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

2

Early Findings

Survey reports demonstrate increases in technology use and some initial evidence of more student-centered pedagogies as the Apple and ConnectED initiative got underway. The results summarized below suggest that the early path of the initiative is consistent with the typical trajectory of change for technology-related initiatives, in terms of the types of changes that tend to emerge first. The initiative is thus well positioned to realize its intended goals in these high-poverty settings.

Changes in Technology Use

Apple provided technology infrastructure upgrades and devices for all principals, teachers, and students, along with a sustained program of coaching and consulting. The influx of technology was an important, but by no means singular, component of the initiative.

Teachers began using technology more frequently than at baseline, especially for differentiating instruction. By spring 2017, teachers were using technology more frequently, for a greater portion of class time each day, and in more varied ways, than they had been at baseline. The largest increases in teacher technology use were for activities related to monitoring students' learning and adapting instruction to individual students' needs, highlighting the value of technology for offering insight into student progress and understanding.

Teachers also increased their use of technology in searching for instructional materials and presenting information to students, although these activities were already common at baseline.

Students are using technology more frequently and for varied learning activities. Expanding access and increasing student use of technology in the context of high-quality learning activities are important first steps toward the larger goal of digital equity. Students indeed increased their use of technology, with the percentage of teachers reporting daily student use in their classroom growing from 31% in 2015 to 75% in 2017. The most common activities reported by students were finding information (e.g., 70% of student survey respondents looked up information at least weekly) and creating products such as presentations. Further, 75% of teachers reported that their students used learning games at least weekly, with students at elementary grades playing more learning games than older students.

Teachers whose students tend to increase technology use have certain shared characteristics, and in turn report using technology in more innovative ways. Of the teachers whose students used technology infrequently prior to the initiative, a few striking differences exist between those whose students' use grew substantially during the initiative and those who did not. The teachers whose

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

3

students became more active users of technology tended to use more technology themselves and had somewhat more positive initial attitudes toward technology. In contrast, teachers whose students used technology less frequently reported less initial confidence and more challenges managing workflow and finding appropriate digital content. Teachers whose students increased their use of technology also reported higher rates of using technology in innovative ways—that is, for activities that would not have been possible without it. These findings suggest teacher comfort and confidence with educational technology influences uptake and instructional innovation. Varying levels of support are required to meet teachers where they are and support them in meaningful technology integration.

Perceived challenges to using technology in instruction decreased greatly compared to baseline. Prior to the Apple and ConnectED initiative, teachers in these high-poverty schools faced a number of barriers to implementing technology in the classroom, each of which diminished drastically as the initiative got underway. The initiative appears to have successfully resolved the issue of adequate and reliable technology access for students: In 2015, many teachers had major concerns about internet reliability or malfunctioning devices (44% and 40%, respectively). By 2017, the number of teachers with similar concerns dropped precipitously to just 15% and 6% respectively. In addition, fewer teachers believed that insufficient instructional time

was a major barrier in 2017 than in 2015 (15% vs 35%), suggesting that when access becomes smoother, technology use demands less instructional time than it might otherwise. An important concern that remained constant over time across principals, teachers, and students was the issue of student behavior associated with using technology, confirming that school-wide technology policy and classroom management strategies need attention in order for technology integration to be productive.

Deeper Learning Opportunities for Students

The Apple and ConnectED initiative is predicated on the belief that instruction supported by digital resources can help students to develop the skills and mindsets needed to learn academic content more deeply and thrive in the 21st Century. The initiative defines "deeper learning" in five dimensions: teamwork; communication and creation; personalization of learning; critical thinking; and real-world engagement. Of these, the first four were included on both 2015 and 2017 surveys; real-world engagement was added to the survey in 2017 based on evolving definitions.

The overall frequency of deeper learning opportunities increased slightly over time. All four deeper learning dimensions that were measured at both baseline (2015) and the spring of 2017 increased in frequency. These changes were relatively small in magnitude, but they are nonetheless statistically significant. The greatest gains

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

4

were seen in personalized learning and correlated with technology use: teachers who used technology more frequently also reported offering more personalized learning opportunities for students. The smallest overall gains were in communication and creation. At a basic level, students were more often using newly available tools such as iMovie and GarageBand to create products that communicated their ideas. However, most of these opportunities for communication and creation did not reflect advanced requirements such as attending to the needs of an audience or applying principles of design. In general, first steps toward deeper learning opportunities were evident in classrooms; at the same time, more support may be needed for teachers to craft increasingly strong opportunities for critical thinking, teamwork, and other elements of deeper learning.

Elementary school teachers were responsible for most of the increase in deeper learning opportunities. Elementary teachers increased the frequency of deeper learning opportunities for teamwork, communication and creation, personalization of learning, and critical thinking in their classrooms between 2015 and 2017. High school teachers, in contrast, stayed at the same levels across all deeper learning dimensions, and middle school teachers increased opportunities for personalized learning but not for collaboration, critical thinking, or communication and creation. This variation may be partly explained

by the nature of learning opportunities that can support test proficiency at each level. For example, elementary schools commonly used adaptive learning games (which drove the increase in personalized learning across levels). These learning games focused on reading and mathematics and were regarded as helpful for basic skills development and therefore enhanced test performance. In contrast, at the high school level, teachers reported struggling to introduce digital learning activities without detracting from lessons they believed would more directly support test performance.

Apple Support for Technology Integration

Among the members of the dedicated support team that came as part of the Apple and ConnectED initiative, each school had an Apple Development Executive (DE) who worked closely with the school principal around strategic planning and instructional leadership, and a designated Apple Professional Learning Specialist (APL Specialist) who devoted a total of 17 days onsite working with teachers during the first year of implementation. All Apple DEs and APL Specialists have extensive backgrounds in education, including education training and classroom experience. Survey questions were designed to help assess how this support aided leadership development and teacher professional learning.

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

5

Teachers described the support they received from Apple Professional Learning Specialists (APL Specialists) as both distinct in nature and more impactful than other professional development (PD) they had received. In contrast to PD they had received prior to the initiative, teachers reported that the professional learning from their APL Specialist (including trainings and informal interactions) focused more directly on their needs; was more hands-on and less lecture-based; and had more follow-up than PD from other sources. They indicated that support from their APL Specialist was more impactful than other PD in the degree to which they used new lessons in their teaching and improved their comfort in allowing students to take initiative. Over 90% of teachers agreed that the professional learning bolstered their confidence around using technology for teaching and learning and gave them concrete skills for selecting digital content and using technology to support student learning.

Principals were also enthusiastic about the leadership development they received from Apple. Of the 82 principals responding to the survey, more than 90% reported that working with their DE was valuable for a range of leadership activities, from clarifying a vision for the school that specified what it would mean to integrate technology into learning, to gaining and implementing new ideas for leadership, to supporting the practical management of implementing a school-wide technology initiative. Perhaps not surprisingly, existing practices proved most difficult to change, with only 35% of principals stating that the Apple leadership support had changed existing leadership practices to a great extent.

Principal and Teacher Attitudes and Beliefs

Beliefs about pedagogy and educational technology form a spectrum, from a more curriculum-focused orientation to a more student-centered orientation, and from skepticism about educational technology to enthusiasm. While a curriculum-focused orientation emphasizes the role of the teacher in delivering established content to students, a student-centered orientation focuses on engaging students in critical thinking and sense-making in a manner responsive to the needs and abilities of the students themselves. For teachers to make a transition toward more student-centered pedagogies and deeper technology integration, beliefs that support these transitions are important.

Teachers' pedagogical beliefs shifted slightly toward student-centered pedagogy, while principals' beliefs remained unchanged. Overall, participating teachers started out with pedagogical beliefs that trended slightly toward a student-centered orientation (i.e., emphasizing personalization and students' sense-making and engagement over more structured content and classroom management), and they moved a bit more in this direction over the course of the initiative. The change was statistically significant, implying that some teachers are becoming more open to the student-centered orientation the initiative seeks to promote and that is supported by research (NRC, 2000; Sawyer, 2006). Principals started out with a stronger student-centered orientation than teachers and that did not change over this timeframe.

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

6

Teachers' views of educational technology remained strongly positive overall, but some—especially high school teachers—expressed new reservations about educational technology. Participating teachers had strongly positive views of educational technology at the outset: they generally believed that educational technology could support student learning and had few drawbacks in terms of added work or distractions. By 2017, these beliefs remained fairly strong, though they dipped somewhat from the baseline. Consistent with prior findings about differences across schooling levels, these dips in enthusiasm were more pronounced for high school teachers than for elementary or middle school teachers.

Outcomes for Teachers and Students

The Apple and ConnectED initiative aims to meaningfully improve learning experiences for some of the nation's most underserved students. Beyond traditional measures of academic success, the hope is that the initiative will improve the school experience for these students, making learning more relevant to their lives, offering more opportunities for students to express themselves, and building their skills for work and life.

Principals reported that the Apple and ConnectED initiative benefited their schools and teachers. By 2017, most principals agreed that the initiative was showing strongly positive outcomes in terms of technology access, teacher confidence around teaching with technology, and student engagement and technology skills, with relatively strong growth in reports of students' 21st century skills as well. However, principals reported that the initiative had not yet had as much impact on teacher pedagogy and traditional academic outcomes such as school accountability metrics. These reports align with the expected change trajectory, which anticipates that technology use and confidence emerge first as teachers begin incorporating technology into their work, and that more traditional measures of academic success are slower to change.

Teachers reported that the initiative supported student engagement and skills. Teachers agreed almost unanimously (98%) that the initiative has been valuable for their schools. Specifically, teachers reported that the initiative benefited students in terms of engagement, learning, and preparation for future success. Regarding engagement, teacher-reported levels of student engagement grew slightly from 2015 to 2017; the change was statistically significant. In particular, basic aspects of engagement (e.g., paying attention) started high and remained high, while deeper forms of engagement (e.g., going beyond expectations) increased over baseline measures. These signs of deeper engagement are important because they suggest that students are not merely on task, but that they are becoming more invested in their work. Regarding learning, teachers reported small but statistically higher levels of student proficiency across most deeper-learning-related skills (e.g., figuring out something new; working collaboratively; creating strong products) since the initiative began. The ability

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

7

to solve open-ended problems remained stable over time. These findings also align with what we know about the technology use and the deeper learning opportunities that students are experiencing: classroom experiences at this early stage in the initiative have typically featured the use of technology to create products and collaborate with peers. Learning activities that demand open-ended problem solving and critical thinking are in evidence in some classrooms, but these opportunities are not yet common.

Students were enthusiastic about their experiences with the Apple and ConnectED initiative, with positive reviews about how the iPad impacted their engagement and learning at school. Students were very positive about their overall experience with

iPads, with elementary students (like their teachers) showing even stronger enthusiasm for the initiative than middle and high-school students. Students were also very positive about how the iPads have changed learning, with majorities reporting the technology helped them to stay engaged, collaborate, and learn. Many students also believed that iPads helped teachers know them better, both because they gave students more opportunities to express themselves and their personal interests and because the technology gave teachers more opportunities to see how their students were doing academically. These student reports mirror those from teachers, who indicated that the iPad enables them to personalize their instruction more than they could previously.

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

8

Conclusion

The scale and the comprehensive design of the Apple and ConnectED initiative, along with its focus on schools serving high-poverty communities, make it noteworthy among technology integration efforts. It goes far beyond many technology initiatives to include in-depth strategic planning, ongoing technology support, and personalized, professional learning for school leaders and teachers. Further, it abandons a one-size-fits-all approach in favor of supporting each school on its own unique journey to improve student experiences and outcomes. These features make the initiative particularly fruitful for research as well, providing an opportunity to study the interplay of different design elements and how they influence implementation paths and ultimate success. Early findings from the research suggest that these design features have helped principals and teachers take important first steps toward achieving their goals.

The changes documented thus far, from broad increases in technology use to deeper student engagement to more frequent opportunities for certain types of deeper learning, represent significant advances toward the types of teaching and learning envisioned by Apple and by participating schools. While an influx of technology of this magnitude would be expected to promote excitement and new opportunities, immediate widespread us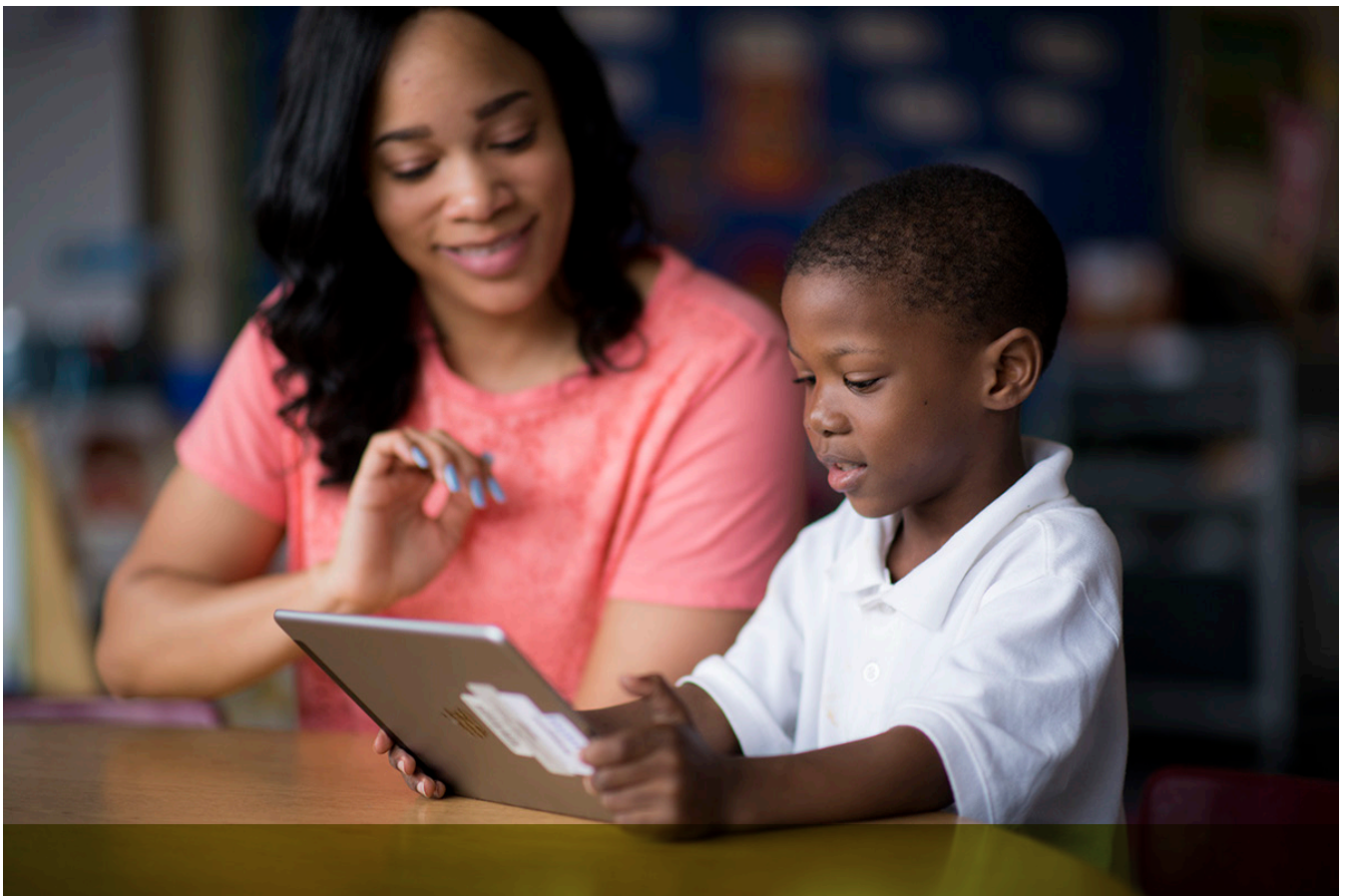e is by no means guaranteed, and these initial advances suggest the strength of the initiative's comprehensive support model and the power of personal support for teachers as they navigate what is often an overwhelming process of change.

At the same time, these changes follow a relatively common trajectory for educational initiatives: technology use and deeper learning have increased first in ways that take advantage of tools and practices that are ripe for implementation right out of the gate, laying important groundwork for deeper changes to teaching and learning that might emerge. The initiative is now entering a new stage, transitioning to a more explicit focus on the deep integration of technology to support critical thinking and conceptual understanding, and evolving new ways to help schools to sustain their positive trajectory amidst inevitable turnover of key staff and other unavoidable interruptions.

For others who may be considering technology integration initiatives, the Apple and ConnectED initiative offers both lessons and new questions to pursue. The initiative highlights the importance of comprehensive and personalized support for technology integration and instructional change. As these implementations mature, on their own paths and within their own local settings, they can continue to instantiate models of what is possible within these diverse contexts and to inform important questions

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

9

about the most essential forms of support, the variety of paths to meaningful change, and mechanisms for promoting sustainability and scalability beyond initial investments.

In this next phase of the initiative, schools face the challenge of deepening the changes they have made thus far: using technology in ways that allow students to visualize complex concepts, connect with the world around them, and build their skills for the future. With these continued advances, schools have the opportunity to make an increasingly profound difference in the education and lives of their students.

The Apple and ConnectED Initiative:
Baseline and Year 2 Findings from Principal, Teacher, and Student Surveys: Executive Summary

10

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