



Pilot-to-Purchase Project

*Piloting Ed-tech Products
in K-12 Public Schools*

*A Report from the University
of California Davis School of
Education to Digital Promise*

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EXECUTIVE SUMMARY

Public school districts indicate reliance on pilots to make purchasing decisions about education technology products¹. How districts define pilots, who are involved in pilots, and what data are considered to evaluate products for purchasing decisions vary. The rapid influx of new technology innovations and products entering the education technology learning applications market increases the necessity for trustworthy and reliable information about products to inform district and school purchasing decisions. However, according to *Fostering Market Efficiency in K-12 Ed-tech*, a study conducted by Johns Hopkins University and Digital Promise on Education Technology Procurement², school districts and developers have different perspectives about the role that school-based education technology pilots play in this process and the value of information collected during pilots.

The purpose of the research study was to identify how school districts conduct pilots of education technology products, understand the challenges that school districts faced in the process, and determine best practices and recommendations for school districts. The study aimed to identify a set of practices that school districts can use to pilot education technology products designed to improve student learning, as well as understand how school districts use pilot outcomes to guide procurement decisions with the goal to use the information learned to assist districts in conducting pilots and using evidence of product effectiveness gained during the pilot process to ultimately make more informed procurement decisions.

The research question guiding this study is as follows: *What is the process that school districts employ when piloting an education technology-learning program?* To supplement the main research question, three sub-questions were used to organize the overall data collection process into smaller pieces that generally followed the expected chronological order of the pilot-to-purchase process:

- ◆ What is involved in the pilot process?
- ◆ What information do districts collect to evaluate the product?
- ◆ To what extent and how does the information that districts collect about the product being piloted influence procurement decisions?

The three sub-questions correspond to how pilots are implemented in school districts, how the success of piloted products is determined through an evaluation process, and how school districts use the information found in the evaluation to guide procurement decisions regarding piloted products.

Six school districts were recruited to participate in the Pilot-to-Purchase Project. The six participating school districts—District of Columbia Public Schools, the Fulton County School System, the Piedmont City School District, the South Fayette Township School District, the Vista Unified School District, and the West Ada School District—were expected to pilot a new education technology project or were already in the process of piloting education technology products. The district characteristics influenced how piloting occurred, and examining how these characteristics affected piloting was an important consideration for learning about the pilot process.

Data were collected about the piloting process in each school district through interviews, focus groups, and surveys of district and school administrators, teachers, and students. Districts also submitted documentation of their pilot process at the end of the spring that was treated as data. Through qualitative analysis of the data, a research team identified major themes surrounding the school districts' experiences piloting education technology products. Within each theme, researchers looked for instances of commonalities across districts to determine common findings for how school districts conduct pilots.

Qualitative analysis highlighted the importance of positive communication and relationships between all involved stakeholders, as well as the importance of student and teacher feedback throughout the pilot process. School districts reported that teacher and student feedback is rarely collected in a

1 Morrison, J.R., Ross, S., Corcoran, R., & Reid, J. (2014). *Fostering market efficiency in K-12 ed-tech procurement*. Digital Promise, Baltimore, MD

2 Morrison, J., Ross, Corcoran, R. P., & Reid, A.J. (2014). *Fostering market efficiency in K-12 ed-tech procurement*. Digital Promise, Baltimore, MD

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formalized process and incorporated into evaluations of product effectiveness. More often, principals informally ask teachers' opinions of products through informal conversation with teachers reporting informal student feedback up the chain of communication. Students' comments in the focus groups were surprisingly mature, and they had particularly insightful comments about advice for education technology developers. The student voice is vital to consider throughout a pilot process, as they are the true end users. The current research attempted to thoughtfully consider the student voice.

Additionally, Digital Promise collected survey data from students, teachers, and administrators. Quantitative analysis of student survey responses, the largest data set, was conducted to examine whether student perspectives of product effectiveness varied by student characteristics as well as factors that influence student use, such as using the product outside of school, experiencing technical difficulties, and having a teacher familiar with the product. The analysis of student responses indicated that ethnically/racially diverse students perceived education technology products to be more beneficial than White students did. In addition, students who experienced technical difficulties indicated that education technology was less beneficial than those who did not report technical difficulties. Students who reported that their teacher was more knowledgeable when using the program responded that education technology was more beneficial.

The evaluation of district and/or product data to determine product effectiveness, particularly within a short time frame, proved to be a challenge for most of the participating districts. While all participating districts intended to use data collected during the pilot to conduct an evaluation of product effectiveness, the types of data that districts emphasized and the types of analysis varied widely between districts. Several districts conducted quantitative analysis to show whether the piloted product affected gains in student learning. In contrast, other districts were most concerned with how much products were being used or with qualitative feedback from teachers and students regarding product effectiveness. Districts also defined success differently; with varied definitions of success, it is difficult to determine an accurate standard for evaluating the effect of products on student improvement, both within and across districts.

Another interesting outcome of the research is the desire of school districts to change and improve their piloting processes. For some districts, the impetus to improve pilot processes arose from previous piloting experiences, while in other districts, the need was identified through their participation in the project. Districts weighed the pros and cons surrounding the decision to develop a formal, somewhat rigid, pilot process that could be used to make well-informed, data-driven decisions about product effectiveness against the risk of stifling innovation and creativity.

The results of this report indicate that school districts generally engage in similar, broadly defined processes when piloting educational technology products, but there remain distinct differences in pilot approaches. Common piloting practices are included in the report, along with detailed recommendations, through the study findings. The findings are organized into the following categories: process, which refers to who and what are involved in the pilot process; evidence, the information that districts collect to evaluate a pilot; procurement how and the extent to which districts use information they collected about the pilot to influence product purchasing decisions; and additional findings, themes that emerged through that research that did not fit neatly into the other categories. Additional details that support these recommendations can be found in the report.

EXECUTIVE SUMMARY

Recommendations for Piloting Ed-tech Products

Process Recommendations

- ◆ Develop a procedure for piloting education technology products.
- ◆ Engage in transparent communication with developers.
- ◆ During the pilot, evaluate whether the product is pliable enough to meet student and teacher demands.
- ◆ Assign a point person during the pilot process for correspondence and IT support concerns.

Evidence Findings Recommendations

- ◆ When student assessment outcomes are considered the benchmark for success, districts should develop an evaluation plan and research design to validly measure the impact of product use on student outcomes.
- ◆ Pilots should include formal mechanisms for collecting student and teacher feedback.
- ◆ Teachers should proactively provide informal feedback to administrators as well as let them know what students say.
- ◆ Administrators should integrate teacher and student feedback in the process of evaluating a pilot program.

Procurement Findings Recommendations

- ◆ School districts should ensure that the length of a pilot provides enough time for making procurement decisions about a program.
- ◆ Post-pilot expectations should be communicated to all stakeholders before beginning the pilot and should incorporate a plan for evaluating the product.

Additional Procurement Findings Recommendations

- ◆ School districts should pass along feedback they receive from teachers and students to the developers to continuously improve the product.
- ◆ Addressing challenges voiced by students and teachers throughout the process will increase support and buy-in for the product.
- ◆ Pilot captains/coordinators should keep in mind the common challenges of piloting a new product and frequently check in with teachers/students/admin to prevent problems.
- ◆ Take careful note of things that did or did not work during a pilot and use this to fine-tune the process. Pay attention to developments throughout the process that are surprising or unexpected.
- ◆ Provide support for teachers in their grassroots efforts to pilot new programs whenever possible. Teachers are more likely to follow procedures when they are provided with support.
- ◆ Where applicable, encourage students to help each other and act as facilitators alongside teachers.
- ◆ Remind teachers to have patience when experiencing shifts in instruction style; the program is meant to improve teaching and learning, but it takes time to adjust.
- ◆ Prepare technological infrastructure (i.e., hardware) for the new software and ensure sustainability before implementation.
- ◆ Have IT support available for teachers at all times in case glitches occur.
- ◆ If the pilot program requires multiple software updates, be sure to have time/staff/money to commit to the updating process.
- ◆ Create a pilot-planning checklist that includes a plan for getting started, pilot implementation, and planning for evaluation and next steps. See the Pilot Planning Checklist in Appendix F.
- ◆ Create a timeline for the pilot process that includes planning, implementation, procurement, and evaluation. See the Ideal Pilot Timeline in Appendix J.

SECTION I—PROJECT DESCRIPTION

“Before I can justify spending any more money on it, I want to know if it really does work.”

—Meridian Academy Language Arts Coordinator at West Ada

Digital Promise recently completed a Bill & Melinda Gates Foundation-funded market study titled *Fostering Market Efficiency in K-12 Ed-tech Procurement*, which demonstrated that U.S. public school districts rely heavily on “pilots” to identify, evaluate, and acquire educational technology products because of 1) limited and untrustworthy information in the market about the products available and 2) a tendency to rely on input from end-users (i.e., teachers) in making product choices. The study also found that the definition of “pilot” varies widely and is most often an informal process, lacking clear goals, structure, and data-based decision making³. The purported reliance on pilots by school districts and opacity surrounding what school districts mean by pilots and how they conduct them prompted interest in learning more about how districts pilot education technology products and what best practices exist in piloting. As a result, six school districts were recruited to participate in this Pilot-to-Purchase Project.

This study aims to identify and share with the public a set of practices that school districts can use to pilot educational technology products⁴ designed to improve student learning, as well as to understand how school districts use pilot outcomes to guide procurement decisions. The six participating school districts—District of Columbia Public Schools, the Fulton County School System, the Piedmont City School District, the South Fayette Township School District, the Vista Unified School District, and the West Ada School District—were expected to pilot a new education technology project or were already in the process of piloting education technology products. Data were collected about the pilot process in each school district through interviews, focus groups, and surveys of district and school administrators, teachers, and students. Districts submitted documentation of their pilot process and evaluation at the end of the spring, which was also treated as data. Through qualitative analysis of the data, a research team identified major themes surrounding the school districts’ experiences piloting education technology products. Within each theme, researchers looked for instances of commonalities across districts to determine common findings for how school districts conduct pilots. Quantitative analysis of student survey results was used to supplement the qualitative analysis.

The results of this report indicate that school districts generally engage in similar broadly defined processes when piloting educational technology products. For example, all school districts engaged in some amount of planning prior to piloting and understood the importance of providing training or professional development as a key factor in successful product piloting. Districts were concerned about or aware of the importance of timely budgeting for pilots and the ability to financially support the broader implementation of products, and they engaged in some sort of data or feedback collection for the purpose of evaluating the success of the product. Districts often differed regarding the specifics within each of these broad categories of piloting. For example, some districts were very concerned with conducting quantitative analyses to show whether the piloted product affected gains in student learning. In contrast, other districts were most concerned with the frequency of product usage or qualitative feedback from teachers and students regarding product effectiveness. Therefore, while each district conducted some sort of evaluation to determine whether the product met their goals, the specific goals and method of evaluation varied quite drastically between districts.

This report is organized into seven sections. Section I, the current section, provides a broad overview of the project. Section II includes a description of the districts that participated in the project and details about the products they piloted. The districts range in size from 1,200 to 95,000 students

³ Morrison, J., Ross, Corcoran, R., & Reid, J. (2014). *Fostering market efficiency in K-12 ed-tech procurement*. Digital Promise.

⁴ Throughout this paper, “education technology app,” “product,” “tool,” and “program” are used interchangeably because both software programs/applications and physical ed-tech products were piloted.

SECTION I—PROJECT DESCRIPTION

and are located across four time zones and five states—Alabama, California, Georgia, Idaho, and Pennsylvania—and the District of Columbia. Table 1 on page 9 demonstrates that each district serves a distinct profile of students. Each district elected to pilot a different product. Six products were piloted for the project: Achieve3000, ALEKS, BrainPOP, Newsela PRO, VexIQ, and STMath.

Section III introduces the research questions and provides details of the methodology employed for the project. The six-month implementation timeline for this project and the distance between geographic locations limited our ability to conduct multiple visits per district and the types of quantitative data collection that would provide additional insight into student and teacher outcomes. There was one site visit per district⁵. Our interest in the pilot process influenced our decision to focus on and gather as much qualitative data as we could during district visits. Prior to the site visits, we worked with district liaisons to schedule at least one focus group each with teachers, administrators, and students. In some districts, we were able to schedule more than one group per audience. If invited pilot participants could not attend a focus group, we conducted individual interviews. When an in-person meeting was not feasible, virtual interviews and focus groups were facilitated across all districts to further connect with pilot participants. Following site visits, quantitative data were gathered via electronic survey distribution for the same audiences, teachers, students, and administrators, who were involved in the spring pilot. Surveys were distributed in the pilot communities by our district liaisons. Section III provides a detailed overview of the data collected and the analytical framework.

Section IV is a presentation of the qualitative results. In this section, we present our top findings from the data analysis and quotes that reflect the findings. The section addresses four themes. The first three, *process*, *evidence*, and *procurement*, reflect the subset of research questions presented in section III. The fourth theme, *additional findings*, includes findings that intersect with more than one of the other themes. A discussion and bulleted list of recommendations for school districts follows each theme. The recommendations presented are not intended to prescribe a specific pilot process but instead can be used as a set of items to consider when planning or conducting pilots of education technology products. Section V presents the quantitative analysis and results from the Digital Promise survey data. The most robust findings come from the student survey because it has the largest sample size of the surveys distributed. Section VI presents the study limitations and discusses the importance of the study results for schools involved in pilots and for future research. Section VI concludes with a summary of next steps for each district involved in the study. Section VII is an appendix containing resources cited throughout the report.

5 Fulton County Public Schools did not participate in site visits from the Digital Promise team. Sagefox Consulting Group, a K-12 research-consulting firm, facilitated on-site focus groups.

SECTION II—DESCRIPTION OF SCHOOL DISTRICTS

The six districts participating in the Pilot-to-Purchase Project were District of Columbia Public Schools (DCPS), the Fulton County School System, the South Fayette Township School District, the Vista Unified School District, and the West Ada School District. These six districts were selected based on their involvement with prior Digital Promise research initiatives, district size, student demographics, and geographic attributes—the part of the country where the district is located—and type of district (i.e., suburban, rural, or urban). The districts are all members of the Digital Promise League of Innovative Schools, a national coalition of school district superintendents that fosters collaboration between education leaders and entrepreneurs, researchers, and thought partners⁶. One benefit of using schools from the League of Innovative Schools is that they are willing to try new things and are experienced in using education technology in the classroom. “I think one of the reasons you don’t see more school systems doing some of the things that schools in the League are doing is because it is complicated and it is hard. It is easier to buy textbooks, and especially if you are getting above-average results. It is a difficult world we live in,” said an administrator from the Piedmont City School District. Table 1 provides an overview of each district.

Table 1: Description of districts

District	District Summary	Pilot Program	Grade Level(s) Piloted	District Need/Focus of Pilot Program
District of Columbia Public Schools	Washington, D.C. Enrollment: 46,415 students Percent low income: 72%	Newsela PRO	Secondary grades	Literacy
Fulton County School System	Atlanta, GA Enrollment: 95,138 students Percent low income: 46%	BrainPOP and IXL	Elementary grades	Develop more efficient pilot process/develop online marketplace
Piedmont City School District	Piedmont, AL Enrollment: 1,240 students Percent low income: 68%	Achieve 3000	6th-8th grades	Digital content in science and social studies
South Fayette Township School District	McDonald, PA Enrollment: 2,780 students Percent low income: 12%	Vex IQ Robotics	3rd-6th grades	Computational thinking/ robotics programming
Vista Unified School District	Vista, CA Enrollment: 22,314 students Percent low income: 63%	ST Math	6th grade	Math
West Ada School District	Meridian, ID Enrollment: 35,600 students Percent low income: 32%	ALEKS	9th-12th grades	Math for low-performing students in alternative schools

6 Digital Promise. Retrieved from <http://www.digitalpromise.org/league#league-of-innovative-schools>

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District of Columbia Public Schools (DCPS)

DCPS strives to provide a top-notch education for all students in every school, regardless of background or circumstance, to prepare them for success in college, career, and life⁷. During the 2014-15 school year, DCPS had approximately 47,500 students and 3,500 teachers in 111 schools across the city. Within DCPS, there are also 3,500 classroom aides, social workers, counselors, custodians, and other support staff and more than 1,000 community organizations and thousands of volunteers who provide support for students and staff⁸.

The product piloted by DCPS for this project was Newsela PRO, an innovative Web-based program that works to build reading and comprehension skills through the medium of daily news stories. It creates a personalized reading level for each student that adapts over time⁹. DCPS has a literacy focus and chose a program aimed at addressing remedial reading challenges. The overall goal is to improve students' reading levels and bring them up to grade level.

DCPS spent time doing comparative shopping, looking for a product that would meet students' needs but was also fiscally favorable. With the choice of Newsela PRO, DCPS hoped to tie together content, comprehension, and reading skills. In the district, there is also a large English language learner population that absolutely requires differentiation in instruction. In an exploratory comparison with another product, Achieve3000, DCPS chose to pilot Newsela PRO because it suited their specific needs and was less expensive.

For the Pilot-to-Purchase Project, the Office of Teaching and Learning worked closely with schools in the district to pilot Newsela PRO. An administrative point person from the blended learning department was in charge of all the Newsela PRO-related communications during the pilot. Academic leadership teams facilitated the pilot within schools and collaborated with central office administrators on budget and purchasing decisions.

Fulton County School System

The Fulton County School System is the fourth largest school system in Georgia. Fulton has more than 11,000 full-time employees, including more than 7,800 teachers and other certified personnel, who work in 101 schools and 14 administrative and support buildings. During the 2014-15 school year, approximately 95,260 students attended classes in 58 elementary schools, 19 middle schools, 17 high schools, and seven charter organizations.

Because the City of Atlanta maintains a separate school system, the Fulton County School System is physically bisected by the City of Atlanta and its school system. While this often leads to references of north Fulton and south Fulton, there is only one Fulton County School System, which is divided into four Learning Communities based on geographical boundaries: Northeast, Northwest, Central, and South¹⁰.

Fulton is in the process of developing a Digital Marketplace to contain all the approved educational technology products available for teacher use. To do so and to choose products to pilot, Fulton tends to look to "early-adopter" or "pioneer" teachers. Many teachers have done research and obtained, funded, and implemented education technology programs in their classrooms; district administrators adopt what these teachers have found for larger-scale use and implementation when applicable. Fulton also has a distinctive position within its schools called METIs or Media Education Technology Instructors. METIs are responsible for identifying and introducing new technology to teachers and leadership, as well as training. Often, ideas are brought into the district through METIs or teachers and then presented to principals for budgeting decisions and central office administrators for procurement decisions.

Fulton is unique in the current study in that they did not explicitly pilot a new product. Fulton chose eight elementary schools from the district (two from each Learning Community) that were already utilizing BrainPOP and IXL to spotlight in the study. BrainPOP creates animated curricular content to

7 District of Columbia Public Schools. Retrieved from <http://dcps.dc.gov/page/about-dcps>

8 District of Columbia Public Schools. Retrieved from <http://dcps.dc.gov/node/96862>

9 Newsela. Retrieved from <https://Newsela.PRO.com/about/>

10 Fulton County Schools. Retrieved from <http://www.fultonschools.org/en/about/pages/default.aspx>

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engage students through the use of characters to introduce topics and lessons¹¹. IXL is a program that offers unlimited math and language arts questions aimed at making learning fun for students¹². Many teachers reported that they use both products daily and could not remember a time that they were without these products. Fulton hired Sage Fox, an outside research consulting group, to conduct focus groups and interviews with teachers. Data from their report (Appendix A) are integrated into the presented results.

Piedmont City School District

The Piedmont City School District is located in rural northeast Alabama. It is a district where technology is viewed as a tool for raising expectations in a town hit by hard times. Once a bustling home to a thriving textile industry, two major employers have left the town in recent years, and many local businesses shut their doors during the recent economic downturn. To restore hope in the community, the district is working to provide an education that prepares students for the modern global economy.

Through its mPower Piedmont initiative, which was launched in 2009, all students in grades 4-12 receive a laptop with home Internet access. To establish the infrastructure to provide all students with home Internet, the district set out to create a so-called “wireless mesh” across the town to offer free Internet access to all its families. The network was built with \$896,000 in funds from an E-Rate pilot program called Learning on the Go, and it was tailored to Piedmont’s irregular Appalachian foothills topography by using strategic locations throughout the community as Internet hotspots. With the wireless mesh established, all students living within the Piedmont district limits received Internet connectivity, with the district and the municipal government covering the costs. For those outside the district limits, Piedmont worked with Verizon to provide MiFi hotspots, making access to high-speed broadband available for only \$15 a month¹³.

For the Pilot-to-Purchase Project, Piedmont looked for a program that would cover science and social studies while also improving students’ reading skills. The district wanted more digital content in science and social studies to increase student engagement in those subject areas. Achieve3000, the selected program, measures students’ individual Lexile levels and tracks their improvement as it reinforces core science and social studies concepts¹⁴. Piedmont recently shifted to a mastery-based learning approach that requires students to master a concept before moving on to new subjects. Achieve3000 was deemed suitable to address Piedmont’s particular needs and goals.

Piedmont, a small district with approximately 1,200 students, has a unique opportunity for frequent collaboration between stakeholders. Piedmont employs a blended learning coach who is actively involved with instruction. There was collaboration and communication among administrators, principals, and teachers to inform piloting of the product and to address necessary changes to meet student learning needs throughout the process. While all districts stressed the importance of communication, Piedmont excelled at collaborating across all levels, including students, in the process of evaluating Achieve3000 in an informal, comfortable way.

South Fayette Township School District

The South Fayette Township School District is located in McDonald, Pennsylvania, a suburb lying twenty minutes from the city of Pittsburgh. The school has approximately 3,000 students and was recently listed by the *Pittsburgh Business Times* as the highest-performing school district in Western Pennsylvania. For the last six years, the South Fayette Township School District has been implementing a K-12 vertically aligned computational thinking initiative. As the program matures, lessons formerly taught in grades 3-5 are now being introduced in grades K-2, creating an opportunity for them to develop deeper critical thinking experiences for grades 3-6 and beyond¹⁵.

For the Pilot-to-Purchase Project, South Fayette partnered with Digital Promise, the Carnegie

11 BrainPOP. Retrieved from <http://educators.brainpop.com/about/>

12 IXL Learning. (2015). Retrieved from <https://www.ixl.com/company/ixl>

13 Digital Promise. Retrieved from <http://www.digitalpromise.org/districts/piedmont-city-school-district#anchor-header1>

14 Achieve3000. (2015). Retrieved from <https://www.achieve3000.com/about-us/>

15 Owens, A. (2015). “South Fayette Digital Promise pilot-to-purchase final report.” Unpublished.

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Mellon University Robotics Academy (CMU), and the University of Pittsburgh Learning Research and Development Center (Pitt) (see Appendix B for details on the expectations of the partnership with CMU). South Fayette’s emphasis on computational thinking and computer programming has blossomed over the years; students now learn programming as early as kindergarten. This early exposure has led to the need for greater challenges for their students, so South Fayette chose to pilot Vex IQ through the Pilot-to-Purchase study to determine whether the product would provide students with the challenge they needed. South Fayette worked simultaneously with Vex IQ and Expedition Atlantis, an online robot programming system that teaches students the math behind robot programming¹⁶. Students then transferred what they learned virtually to Vex IQ, where they worked to program actual physical robots.

With their strong academic research partners supporting the pilot, South Fayette has excelled in organized planning and curriculum alignment in both middle and elementary school. They have been able to implement the pilot in both elementary and middle schools and worked with their partners at CMU and Pitt to analyze the data. South Fayette is overall a very progressive and innovative district. Because of their innovative spirit over the years, South Fayette created a STEAM Coordinator position to work with students on integrating science, technology, engineering, art, and math.

Vista Unified School District

The Vista Unified School District in Southern California serves more than 22,000 students—a majority of whom are considered low income and qualify for free or reduced-price meals. Vista aims to inspire students to think critically and collaborate to solve real-world problems.

The superintendent at Vista works alongside members of the school board to set goals for the district—such as implementing technology-supporting personalized learning environments and instilling 21st-century skills—and helps to ensure that teachers and administrators have the resources necessary to reach these goals. Those resources include personnel—the district brought in instructional technology resource teachers and established a department of innovation—devices, and teaching tools such as Defined STEM, which uses multimedia and real-world scenarios to teach science, technology, engineering, and math concepts¹⁷.

Vista’s goal for the Pilot-to-Purchase Project was to address the challenge of below-grade level achievement in mathematics. Vista was also seeking to align with the Common Core curriculum and prepare middle school students for high school math. Vista piloted ST Math, a Web-based mathematics program that simulates video game play.

Vista placed a weighty focus on supporting their teachers throughout the pilot process. Two Technology Resource teachers were assigned to lead the product implementation and IT support during the process and were available at any time to teachers who needed help. One of these teachers was an asset in particular during the implementation of ST Math because of prior classroom experience using the program. He was able to transfer that experience to support Vista’s teachers. Vista’s commitment to timely IT support and troubleshooting helped guide their teachers smoothly through the process.

West Ada School District

The West Ada School District is the largest school district in Idaho, encompassing most of Boise’s suburbs and a chunk of the state capital. It also receives about \$4,077 per student, among the lowest funding rates in the nation for a district of its size. West Ada enrolls more than 37,000 students and employs just 115 central office staffers in a geographically sprawling area. While many districts would bemoan these limitations, West Ada views itself as a lean district that can be nimble. It was one of the first districts in the region to have computers, was the first to offer computerized testing, and has worked to stay ahead of the increasing broadband demand in the district¹⁸.

16 Carnegie Mellon Robotics Academy (2015). Retrieved from <http://education.rec.ri.cmu.edu/expedition-atlantis/>

17 Digital Promise. Retrieved from <http://www.digitalpromise.org/districts/vista-unified-school-district>

18 Digital Promise. Retrieved from <http://www.digitalpromise.org/districts/meridian-joint-school-district-no-2>

SECTION II—DESCRIPTION OF SCHOOL DISTRICTS

For the Pilot-to-Purchase Project, West Ada piloted ALEKS, a Web-based mathematics program that tracks students' mastery of the topics. West Ada wanted a program that would meet students' needs in mathematics and bring them up to grade-level performance. West Ada's experience with ALEKS started several years ago with teachers emphatically using ALEKS in the classroom, finding creative ways of funding it, and encouraging the district to commit funds to expanding ALEKS. West Ada wanted to determine whether ALEKS was effective at increasing student achievement.

With the support of Digital Promise, West Ada piloted ALEKS in three alternative high schools that enroll students who were low-level performers in traditional public schools. West Ada measures student improvement with state test scores, as well as student scores on program-embedded tests and classroom assessments. West Ada, unlike other participating districts, has specific evaluation standards: when piloting a program, there is an expectation that student improvement will meet or exceed the district performance norms. A West Ada principal said, "Students in our school are way behind and expected to be on grade level by the end of the school year. At a minimum, students are expected to advance two levels per term when using ALEKS."

If students do not meet district improvement goals and performance improvement cannot be significantly linked to program use, it is very unlikely that the program will be purchased or that support will be provided by central administration. West Ada chose to focus on data collection and analysis and could do so because the district has established the unique position of a research coordinator within the central administration who regularly liaises with school-based teachers and principals. The individual in this role was extremely helpful to the district in propelling the pilot process in a research-informed way, frequently gathering data on student use, teacher use, and pilot progress.

SECTION III—METHODOLOGY

Research Questions and Purpose

The research question guiding this study is as follows: What is the process that school districts employ when piloting an education technology learning program? This question was identified based on a previous research project on procurement of education technology products that found that many districts are mistrustful of information on product effectiveness provided by vendors and therefore conduct their own pilots or tryouts of technology products to determine their effectiveness¹⁹. Additionally, districts voiced the need for more guidance regarding best practices in conducting pilots of education technology products.

To complement the main research question, three sub-questions were identified as follows:

- 1 What is involved in the pilot process?
- 2 What information do districts collect to evaluate the product?
- 3 To what extent and how does the information that districts collect about the product being piloted influence procurement decisions?

The purpose of answering the main research question along with the three sub-questions was to identify how school districts conduct pilots of education technology products, identify challenges faced by school districts in the process, and identify best practices and recommendations for school districts to assist them in conducting pilots.

Methods

The current study was designed to learn more about the pilot-to-purchase process that districts employ when selecting education technology programs, apps, and resources. Pilot-to-purchase refers to moving through the process of implementing and evaluating a pilot and making a purchase decision about the pilot product. To select methods to be used for data collection, a logic model was established to aid in determining what types of data would provide answers to the primary research question. By organizing the logic model into short-term, mid-term, and long-term goals, we were able to establish research themes and to identify our data collection strategy (see Appendix L). The emphasis on learning about the pilot process influenced the researchers' decision to employ a mixed-methods approach to data collection. Diversity among districts—size, student population, and product to be piloted—and the project timeline, as districts agreed to complete the pilot and to submit a report between January 1 and June 30, 2015, were secondary influences on the selected data collection method.

Data

"Data" refers to the information collected, how it was collected, and any limitations of the data collection. Both qualitative data and quantitative data were collected from the participating districts as part of this process. Qualitative data were collected primarily through interviews and focus groups with students, teachers, and administrators conducted at the time of site visits to districts. Additional qualitative data collected include documentation of the pilot process from each district. District documentation consists of a report about the piloting process with artifacts related to the piloting process, such as a timeline, a description of key stages in the piloting process, a description of the types of data collected, how the district evaluated the product, and, if possible, the raw data used in the evaluation (see appendices A-E for example artifacts). Quantitative data were collected in the form of surveys about the pilot process, and the piloted products were distributed to administrators, teachers, and students. Survey questions can be found in Appendices G and H.

Not all districts participated in the Digital Promise surveys. Five districts affirmed distribution of the survey link to their students, teachers, and administrators, but student data were collected from only four districts. Collection of student data from the sixth district was affected by district approval for the research project. DCPS required an approved IRB research application to accompany the district

19 Morrison, J., Ross, Corcoran, R., & Reid, J. (2014). *Fostering market efficiency in K-12 ed-tech procurement*. Digital Promise.

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research application. Submission and approval of the University of California Davis School of Education IRB included CITI human subject training for the primary researcher, and completion of standard IRB forms that include data security processes. The DCPS research application is a similar process. The DCPS research application is a similar process. Careful review of each of these applications involves internal committees and a minimum of four to six weeks per application for approval. Data collection for the Pilot-to-Purchase Project could not occur without University of California Davis School of Education approval; DCPS data sharing and collection could not occur without a DCPS-approved research protocol and MOA.

This project aimed to incorporate student participants. The student voice is often omitted from pilot studies even though students are often the primary audience of the piloted products. To facilitate the collection of data from students, the research team created a survey intended to gather student perspectives about the pilot, teacher engagement with the product, whether they believed that the product helped them to learn, and whether they believed that the product improved interpersonal (21st-century²⁰) skills. In addition to the student survey, the research team conducted a similar survey to gather teacher demographic information and learn about their opinions of the pilot process.

Focus groups and interviews. Focus groups and interviews were determined to be the most efficient approach to learning about the details of the pilot-to-purchase process and for reaching a variety of district personnel involved in the pilot process because they afforded the best opportunity to collect sufficient information and detail about the pilot process. Focus groups were held with administrators involved in the pilot process. Participants in these groups varied but often included personnel responsible for IT, procurement, curriculum design, professional development, and classroom/school implementation. Teacher and student focus groups involved those who were participating in the spring pilot.

Qualitative studies often include repeated site visits and observations for data collection. The current study was limited to one site visit with five of the six districts—Fulton County being the district for which a site visit did not occur. During the site visits, researchers facilitated multiple focus groups and interviews. We relied heavily on site visit data for our analysis. The data collection team included a communications team member to assist with video recording and a note taker. As researchers, we also relied on districts to communicate and schedule surveys, focus groups, and interviews. While specific requests were made to include procurement decision makers in the process, these stakeholders were often omitted from our site visit meetings. Interviews and focus groups took place during the months of May, June, and July, with all but one of the focus groups being facilitated during the month of May. Follow-up interviews were scheduled in June and July with district personnel who were absent from or unable to schedule site visits in May. The short data collection window was selected to meet the grant deadline of June 30, provide schools with time to engage with the piloted products, and to accommodate school year schedules. Follow-up telephone interviews with districts were conducted to learn more about the procurement process with these stakeholders. These data were integrated into this report but without the same level of analytical processing applied to earlier interviews and focus groups.

Focus groups and interviews were audio-recorded and transcribed. Three researchers analyzed the transcripts using the NVivo qualitative statistical analysis software. The findings were organized into three key themes: process, evidence, and procurement, with the objective of defining a pilot process that school districts can use to evaluate tech learning tools to make informed purchasing decisions. During the analysis, researchers identified important findings that did not fit neatly into one of the three primary themes. More often than not, these findings cut across multiple themes. These crosscutting findings were placed in a fourth theme, labeled Additional Findings.

20 21st-century learning skills are a set of social skills that are considered important for students to function successfully in society. The education reform community defines them as a broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today's world, particularly in collegiate programs and contemporary careers and workplaces. Generally, 21st-century skills can be applied in all academic subject areas and in all educational, career, and civic settings throughout a student's life.

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Digital Promise surveys. In addition to qualitative methods, Digital Promise also collected data for quantitative analysis through surveys distributed to districts via an online survey link. Surveys were designed with several objectives: to learn about the profiles of participants and to capture the perspectives of students, teachers, and school-based administrators about the process and the piloted product. Survey data were collected from the middle of May to the middle of June. The survey links were emailed to the Pilot-to-Purchase liaison at each school with a brief explanation of what to expect when completing the survey. These liaisons were responsible for disseminating the survey link to the targeted audiences. Completed survey responses were compiled using the survey program utilized and were directly available to the primary researcher.

Students, teachers, and administrators who participated in the piloting of products for the Pilot-to-Purchase Project answered survey questions about both the effectiveness of the piloted product as well as the process of piloting. Students were asked questions largely about their experience using the piloted product; administrators were asked mostly about the process of piloting; and teachers were asked questions regarding both the product and the piloting process. The surveys served two purposes. First, they served as additional data for school districts regarding stakeholder perceptions of the piloted product and the piloting process, which they could factor into their own internal analysis of the effectiveness of the piloted program and the pilot process. Second, the survey allowed us as researchers to collect common information across all school districts to analyze and from which to draw findings. The only survey that had a sample size large enough to enable the application of complex quantitative analysis was the student survey, with a sample size of 1,262. The analysis of the teacher survey and administrator data was limited to descriptive frequencies because of the sample sizes of 36 and 9, respectively.

Table 2: Teacher demographics

Age Group	Percentage (%)	Frequency
<i>Less than 20 years</i>	2.8	1
<i>20-25</i>	25.0	9
<i>30-34</i>	22.2	8
<i>35-39</i>	19.4	7
<i>40-44</i>	2.8	1
<i>45-49</i>	11.1	4
<i>50-54</i>	8.3	3
<i>55-59</i>	2.8	1
<i>60-64</i>	5.6	2
Ethnicity		
<i>Black or African American</i>	16.7	6
<i>Non-Hispanic White</i>	69.4	25
<i>Hispanic, Latino, or Spanish origin</i>	2.8	1
<i>Filipino</i>	2.8	1
<i>Two or more races</i>	8.3	3
How long have you been a teacher?		
<i>Less than 1 year</i>	2.8	1
<i>1-2 years</i>	11.1	4
<i>3-5 years</i>	27.8	10
<i>6-10 years</i>	13.9	5
<i>More than 10 years</i>	44.4	16
Total	100	36

Teachers from five districts participated in the teacher survey, for a total of 36 teachers. DCPS, with 15 participating teachers, was the district with the highest number of teacher respondents. We did not receive any survey responses from teachers in Fulton County. The teachers who responded to the survey had primary responsibility for implementation of the pilot product. More teachers were involved in focus groups/ interviews but not included in the survey data.

A majority of teachers reported having 20-25 students on average in their classrooms, with the second highest number of teachers reporting having 26-30 students. Interestingly, a majority of teachers, 52.8%, reported using the pilot product in their classroom only one to two times a week, while the lowest reported frequency was once a day, among only 2.8% of teachers. Table 2 shows the participating teacher

SECTION III—METHODOLOGY

demographics and length of time as a classroom teacher.

Table 3 shows student survey participation and demographics. As shown by the survey descriptive statistics, neither DCPS nor Fulton participated in the student survey. Of the 1,262 total student respondents, almost half (608) were from South Fayette. West Ada had the fewest respondents with 68.

Table 3: Student demographics

	All Districts	Piedmont	South Fayette	Vista	West Ada
White	61.5%	70.2%	80.5%	23.3%	69.1%
English at Home	80.7%	92.1%	94.6%	48.2%	92.8%
Report Card Grades	3.0 (A-B)	3.1 (A-B)	1.9 (A)	4.1 (B)	5.1 (B-C)
Grade in School					
1	0.0%	0.0%	0.0%	0.0%	0.0%
2	0.0%	0.0%	0.0%	0.0%	0.0%
3	0.0%	0.0%	0.0%	0.0%	0.0%
4	16.8%	0.0%	34.7%	0.0%	0.0%
5	18.9%	0.0%	38.5%	0.6%	0.0%
6	46.2%	34.0%	26.5%	98.1%	0.0%
7	5.8%	36.1%	0.0%	0.8%	0.0%
8	4.9%	29.8%	0.0%	0.6%	2.1%
9	4.3%	0.0%	0.0%	0.0%	56.3%
10	1.9%	0.0%	0.0%	0.0%	25.0%
11	1.1%	0.0%	0.0%	0.0%	14.6%
12	0.1%	0.0%	0.0%	0.0%	1.0%
<i>N</i>	1,262	191	608	364	96

The student surveys were analyzed using the SPSS statistical analysis software. Multiple regression was used with district fixed effects. The inclusion of district fixed effects means that only within-district variation was analyzed, controlling for the many attributes that are constant for students within a given district but vary across students in different districts, such as the program or product used, district size, grades of students involved in the pilot, etc.

The dependent variables included whether students thought the program was easy to use and students' reported levels of agreement from 1 (strongly disagree) to 5 (strongly agree) that the program improved the following areas: participation, teamwork, confidence, motivation, excitement, engagement, effort, problem solving, verbal communication, and understanding content.

The independent variables included in all the models were dummy variables for each district, for district fixed effects (Piedmont was the excluded category, meaning that the responses for Piedmont served as the baseline for comparison), self-reported variables for whether the student is White, students' report card grades, and whether the student speaks English at home. In a second regression model, students' reporting of technical difficulties, whether they use the program at home, and whether they think that their teacher has a good understanding of how to use the program were included as additional variables. The exclusion of cases where there was a mismatch between the district name and education technology product piloted did not alter the strength of significance or direction (positive or negative) of the relationship.

SECTION IV—QUALITATIVE ANALYSIS RESULTS

When conducting qualitative analysis, the research team identified and coded themes relating to how school districts conduct pilots, collect and analyze data to evaluate the piloted product, and make decisions at the conclusion of piloting. The research team reviewed the themes to determine the top five important findings within each theme, although, for some themes, fewer or more than five major findings emerged from the analysis. The criteria for determining whether findings were important included whether the finding applied to multiple districts in the sample and researcher perceptions of the importance of the findings. To avoid bias, the research team discussed and came to consensus on the top five findings for each theme. Themes were organized into one of the three research questions, if possible, which generally correspond to the chronology of conducting pilots: the process of planning for and conducting pilots; collecting and analyzing data to determine the effectiveness of the piloted product; and the decisions that must be made after a pilot, such as whether to purchase the product for broader implementation. However, some of the identified themes, such as communication and relationships, did not appropriately fit into a chronological framework, as they cut across several of the research questions. As a result, a fourth category of crosscutting themes was identified as “additional findings.” The following section is organized into the four categories described above: process, evidence, procurement, and additional findings. Because determining an appropriate order for presenting the findings proved difficult, the themes of the findings within each research question category are presented in alphabetical order. Note that the findings and quotes presented in the tables are based on what participants said, not researcher interpretation. A discussion and recommendations for each of the four categories follow the presentation of findings in each category.

Process

“We were infusing technology into our district at a rapid rate. The superintendent and his team said, ‘Hey, let’s pilot.’ It got out of control.”

—Vista Superintendent

“Process” refers to who and what are involved in the pilot process. Findings in this section relate to the planning and implementation of pilots. The themes of findings included in the section are budgeting considerations for pilots, goals for pilots, defining a successful outcome for a pilot, planning and understanding district needs prior to piloting, providing professional development, product usage, identifying the roles and responsibilities of those involved in the pilot process, and identifying the pilot timeline. Process emerged as the most detailed part of the pilot process. Many steps and endless considerations are involved in the process.

Budget. Budgeting considerations play a large role in the piloting process in terms of both the actual piloting of a program and determining the cost of programs if they are to be adopted on a broader scale after piloting. Major budgeting decisions surrounding the piloting of products are generally the responsibility of school principals or the district’s central administration. Budgeting decisions must be made at specific time points in the fiscal calendar, constraining when and whether major purchasing decisions can be made. As a result of these constraints, districts often determine piloting timelines in part based on budget timelines. According to a Media and Education Technology Instructor from Fulton County Schools, the pilot timeline “really depends on when we’re making budgeting decisions... We’re trying to determine when [and] what we’re going to commit our budget to.” Overall, budget was one of the biggest challenges during the pilot process as well as the biggest determinant of purchasing decisions. Even if involved teachers and students like a product, it must be included in the budget and approved for the following year before it can be purchased. Furthermore, before it is even considered for the budget, district officials want to observe significant evidence of the program’s effectiveness.

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Table 4: Budget findings and quotes

Findings	Quotes
Districts plan budgets a minimum of a year in advance and would prefer that pilots align with budget timelines (see Appendix I).	"At this point, we would go back with the evaluation, project costs for the future, and then go back to the business office and say, 'Here's our goal for the future.' Then, it would be probably a year cycle before we would build it into the budget, but it would be a year before it would be implemented" — <i>South Fayette Director of Technology and Innovation</i>
Funding streams for education technology products vary by district, by school, and by level of student performance (i.e., if student performance visibly improves because of the product, districts are much more likely to commit funding)	"I'm not paying \$5,000 per classroom or for a building for a program that comes in below the control groups on performance ... that there's no significant impact, there's no significant difference. That's where we're at with ALEKS. It's out there, being used, and we're trying to figure out... how effective is it?" — <i>West Ada School Administrator</i>
No standard pricing structures for vendors; product prices presented to districts vary in structure from vendor to vendor	"If it is a yearly cost per student, just give us what it is going to cost us yearly and don't surprise me with some kind of, 'Oh, yeah, we can train you, but it is going to cost extra" or 'You have to do this extra training.' We hear that all the time. Transparency, transparency, transparency. That would be nice to have it on the other side." — <i>Piedmont Superintendent</i>
Smaller districts negotiate/build relationships differently with vendors than larger districts. Districts often negotiate the price of programs with companies before piloting.	"Some of the stuff that we used we ended up with because companies gave it to us and said, 'Here.' Here's our suite. You can have it.' That's what Jerry was saying. It is hard not to use something if they give it to you forever for free." — <i>Piedmont Superintendent</i>

Defining pilot success. School districts pilot new educational technology products to see whether they are successful before they decide to purchase them and roll out a wider implementation. But what does it mean to be successful? We asked districts, "What does success look like?" Districts interestingly had a difficult time answering this and provided us with a multitude of different answers. While preparing for the spring pilot, Digital Promise provided support to each district through conference calls and email check-ins to assist with product implementation. As part of this process, we asked districts a series of questions, including how many students would be using the pilot product and what student outcome would be the benchmark of a successful pilot. Early on, both of these questions were a bit challenging for districts as they worked to secure the product and arrange professional development for teachers. Once pilots began taking shape and teachers were trained, districts were better able to supply fairly accurate estimates of the number of teachers, classrooms, and students involved in the pilot. Surprisingly, five of the six districts were still unable to offer a specific benchmark of student improvement that would indicate that piloting the education technology tool was successful. Even though at least two districts stated that they would be focusing on developing a pilot process, having a defined benchmark of success seems as if it should be an essential component of labeling a pilot successful.

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Discordant findings relate to how and who defines success for a district. During focus groups with students and with teachers, researchers asked what a district would do if only some students showed improvement after using the piloted program. Thoughtful students remarked on the varied academic performance of students and wondered aloud if all students should be judged using the same metric. A student at Vista commented, “I don’t think that’s fair because some students learn at different paces. If you learn at a fast pace, you’ll get a good grade in that class, but that’s just because you learn at a faster pace... for other students that can’t learn as fast, they’ll get a worse grade because of that... At the end of the year, you guys will still know almost the exact same things but say it took longer to learn and they got a worse grade than they did. It’s unfair.” The findings in Table 5 exemplify how districts defined success and are related to data analysis, student engagement, feedback from students and teachers, and learning improvement. All of these findings were mentioned more than once, but not all were mentioned by every district.

Table 5: Defining pilot success findings and quotes

Findings	Quotes
Success and the bottom line for many districts is the data and being able to track growth	“...it’s just so bottom line. It’s just a data-driven culture in the schools and a lot of some of those other factors. Like I said, what gets monitored is what gets done.” — <i>DCPS Assistant Principal of Literacy</i>
Success is students learning something new they would not have necessarily learned, a deeper learning experience	“When you have students not only reading but exploring and finding out about different areas that they didn’t necessarily know exists.” — <i>DCPS Assistant Principal of Literacy</i>
Success is getting teachers comfortable with a new program	“I think the time it [the pilot] gets really scary when it’s really big and broad and there’s a lot of bells and whistles and this assignment and this dashboard. It’s a really quick and easy way for them to dip their toe in that was really non-threatening. That also was a big component from a school administrator... someone who helps to make decisions about what tools we’ll use. That was really important.” — <i>DCPS District Administrator</i>
Success is improving student engagement and attention	“If the students were not engaged, I think it would automatically be off the table. There would be no questions asked, because that’s one of the biggest things is student engagement. If they’re not engaged, they’re not going to learn... They have to be excited to come to class, or you’re not going to have their participation that you’re hoping to have.” — <i>South Fayette Technology Teacher</i>
Success is the district gaining a better understanding of their needs/pilot processes and getting honest/pointed feedback from participants	“I think that a lot of what success looks like for me is very honest and pointed feedback about what they like about the program, what they dislike about the program, and what they think would need to be true for them in their context to find success.” — <i>DCPS District Administrator</i>
Success is differentiation within the classroom; letting kids work at their own pace to understand basic skills and fill gaps of knowledge	“It’s been a nice tool for the teachers to be able to individualize instruction for different students to meet their needs. They’re providing extension for the high performers, and they’re providing remediation and support for those who need to come along more.” — <i>Vista Principal</i>

SECTION IV—QUALITATIVE ANALYSIS RESULTS

Pilot goals. Asking teachers and administrators to communicate their goals for the pilot was another prompt in the interview and focus group transcripts related to but distinct from defining pilot success. District officials described pilot goals as higher-level intentions for their pilot, planned from the beginning of the process and often aligned with district visions. Districts approach pilots with these goals in mind and expect them to be met through the use of the new product. Pilot goals are the measurable outcomes set by districts prior to conducting the pilot. This is in contrast to defining success during the process, where the definition often changes because of new insights and is not always measurable. However, there is some overlap between the two, including student engagement, instructional differentiation, and improved data evaluation.

Table 6: Pilot goals findings and quotes

Findings	Quotes
Districts want the lessons/content within the program to align with the curriculum	"One goal, I guess, is to see if it would give our students something that we can use and connect with our standards. Providing good materials where we can see growth from them." — <i>Piedmont Middle School Teacher</i>
Districts are placing increasing emphasis on personalized/individualized learning; districts want programs that tailor instruction to students' specific needs and skill levels providing remediation for those who need it	"I think finding a resource that personalizes the content for each student. I think that's something that was important for us to find." — <i>Piedmont Teacher</i>
Student engagement with the program is important; students need to stay interested	"I look at student engagement. If they're not very engaged, then I try to do something different." — <i>Piedmont Teacher</i>
Main goal is to see student growth and improvement in reading level/math/content knowledge (depending on the program)	"Yeah, I feel like success with our demographic is temporary and the fact that our goal is to just get them to learn math this quarter. I feel like that ALEKS really helped with that because our kids are all on different levels... It really helps us try to meet each individual student where they're at..." — <i>West Ada Teacher</i>
Being able to track improvement and growth with better data collection is a goal	"I've seen them [the school board] on occasion ask, 'What are you going to do to measure effectiveness?' They'll ask that question. They'll go, 'Are you going to do a pre-test, pre-assessment of a student's capabilities,' or whatever the case may be and then do the post so that there's some sort of measurement at the end of the day so we can determine [whether it was] effective." — <i>Vista District Administrator</i>
Success is differentiation within the classroom; letting kids work at their own pace to understand basic skills and fill gaps of knowledge	"It's been a nice tool for the teachers to be able to individualize instruction for different students to meet their needs. They're providing extension for the high performers, and they're providing remediation and support for those who need to come along more." — <i>Vista Principal</i>

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Pre-pilot needs and planning. “Pre-pilot needs and planning” refers to the substantial amount of preparation that districts undergo when conducting a pilot. Once a district identifies the specific needs to be addressed by using an education technology product, research on the viable alternative products that could be used to address the particular need must take place. A Piedmont teacher said that it is important to “make sure it’s going to meet students’ needs, what your goals are, and what you’re looking for.” Forethought concerning which grade levels, types of students, schools, and teachers are to be involved must occur in pre-pilot planning. These decisions should be made in conjunction with how the outcomes of the pilot will be evaluated and how data will be collected. An assistant principal from DCPS chose a particular group of students in part based on scheduling, student needs, and the ability to collect sufficient data. “We have an intervention block for our middle school students. That group seemed to be a unique group that we could really look at some hard data because of the enrichment and the intervention that they would be receiving,” she said. In addition, logistical issues such as technological capacity must be considered to ensure that there are enough devices, appropriate bandwidth, and support capabilities. The responsibility for planning ahead of time varied by whether the pilot was led by teachers or administration. For example, in Fulton County, there are many teacher-led pilots. These are informal pilots that occur when a teacher has identified a product for use in the classroom. For these pilots, teachers often must raise their own funding for the pilot and handle many of the logistical issues.

Table 7: Pre-pilot needs and planning findings and quotes

Findings	Quotes
District officials understand the importance of planning for pilots, including identification of district needs, researching products, making decisions about which grades/classes should be involved in pilots, and planning an analytical strategy.	“It takes a lot of research. It’s easy to say I’m going to pilot a product, but you don’t want to just pilot anything. You want to really go. You really want to do your homework. ...You want to find out who is using different products and what results did they get. How is it utilized? You might want to look at the pricing...” — <i>Piedmont Superintendent</i>
In some districts, the decision to conduct pilots is left to schools/teachers, and in others, decisions occur more centrally.	“Everybody was piloting so much that [the IT Director] came in one day in a sweat and said, ‘I don’t know what [this is.] Who’s this? What’s this?’ It was hitting him and his team as far as setting it up. It was people we didn’t know. We started developing a system.” — <i>Vista District Administrator</i>
Student engagement with the program is important; students need to stay interested	“I look at student engagement. If they’re not very engaged, then I try to do something different.” — <i>Piedmont Teacher</i>

Product usage. “Product usage” refers to how and how often teachers and students use a product in the classroom. Some districts set standards for the pilot surrounding the amount of time that participating teachers and students should use the product and monitored the product usage data to evaluate the pilot. Students in several districts had the ability to use the product at home to catch up on their work or get extra practice. There were concerns around setting usage goals or standards because students and teachers might experience burnout because of overuse. Teachers creatively supplemented the pilot product with other instruction or used rewards to motivate students. Because, in most cases, the product was new to both teachers and students, teachers often learned alongside the students. Product usage is an important theme to consider when evaluating the success of a pilot as well as observing the interesting dynamics created when something novel is introduced in the classroom.

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Table 8: Product usage findings and quotes

Findings	Quotes
Administrators monitor multiple aspects of product usage as part of the pilot process and when evaluating the program, i.e., which teachers and students are high users? Are students using it outside of class or over the summer?	"You're looking at the second set of progress monitoring data, and you're seeing whether or not it was effective. Then you go back and you drill down. You look at the usage to see if students are actually going through and reading all of the articles, answering the quizzes, and doing the prompts. One of the things that I like is the immediate feedback." — <i>DCPS Assistant Principal of Literacy</i>
Teachers and students supplement programs with additional resources and strategies to increase success. Students are also encouraged to work together to solve problems.	"There is this one particular game with six kids playing where they're stretching this block; it was really difficult. We projected it up onto our screen and we played it with them a couple [of] times and talked about some of the strategies that were working for some of the students and not working... why it didn't work. We just played through a couple [of] levels of the game with them as a whole group. Then some of them were like, 'Oh, I get it.'" — <i>Vista Teacher</i>
Initially, some programs are used outside of the existing curriculum, but with more familiarity, teachers/admin expect to work program use into curriculum and standards. Teachers like to incorporate programs into curriculum.	"...we don't know the ST Math curriculum well enough. We haven't seen what all the little programs are. I'm sure that there is a way that you could actually pull a certain module and say, 'Okay, we're doing this module today because it does align with what we're teaching.' At some point, I'm sure that is something that we could do..." — <i>Vista Teacher</i>
Teachers are often learning the program/product along with students.	"Last time, my teacher got mad in stretchy blocks. She couldn't figure it out. Me and her had to work together in order to figure it out." — <i>Vista Student</i>

Professional development. When implementing a new product in the classroom, teachers require professional development. Teachers voiced the need to be well trained on any learning material used in their classroom so they can transfer that knowledge effectively to their students. Teachers and administrators alike expressed a desire to receive professional development before the product is introduced in the classroom, as well as follow-up training to address any challenges that arise. Administrators and teachers both indicated the necessity of professional development offered by the vendor and expressed that professional development is most beneficial when it is interactive—meaning that the teachers learn specific skills and knowledge they can immediately apply in their classrooms. The vendor should show districts how to properly use a product, and follow-up training should be available to teachers whenever something is unclear. In addition to vendor-provided professional development, it is also helpful to have product experts on staff within the district to provide ongoing training and troubleshooting. As use of the product continues, more challenges arise that necessitate more professional development. A school administrator at West Ada described the flexibility needed in terms of professional development: "Most products that I'm seeing out there, digital, are changing and morphing, frequently, within the year. You need to have that change mindset, that ability to be adaptable, and learning constantly. That's where, I think, the PD is critical, ongoing."

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Table 9: Professional development findings and quotes

Findings	Quotes
Interactive professional development for teachers, with takeaways they can use immediately, is key to a smoother product implementation	"It was giving the information, 'Here you go,' and then turn us loose for the year. With Achieve 3000, I think it's been good with the pilot because we were able to preview it and then had training, go back to our classroom, use it, come back to training giving us how can we use things differently, what worked, what didn't work. That was beneficial for that as far as piloting it, having that follow-up training." — <i>Piedmont Teacher</i>
On-site, district-based support is helpful for addressing glitches and unknowns with the product and key for teachers	"Basically, if I'm having a technology issue here, I have a support team that will be down here within an hour, if not quicker, to take care of whatever problem it is. They're basically at my disposal any time I need them. They come down and help me." — <i>South Fayette Technology Teacher</i>
Administrators made sure that there was PD available and that teachers involved in the pilot attended the PD; administrators planned and budgeted for it; sometimes teachers were paid to attend PD sessions as an incentive or if it was held after school	"The PD we do is only one day. Each time we did the PD, what I did was I split it so I didn't have a lot of teachers out of class. I might have had two out of a half a day and then three out a half a day, or something like that. You just got to juggle it." — <i>Piedmont School Principal</i>
In-person PD is valued, and having online PD as a back-up is an asset	"[We need] professional development... face-to-face [about] differentiation and rigor. Those are the words that just get thrown out there and everybody interprets them differently, even within different schools. We're all like, 'Yeah, we've got differentiation. Oh, wait. What? You think that? I think this.' So, just clear consistency among the county would be nice." — <i>Fulton Teachers</i>
Providing PD for administrators is an asset to the teachers re: buy-in and knowledge of program via interaction	"Our principal was here for a lot of the training, and our curriculum coordinator was here for the training. They got to hear our conversations during training, what we liked and what we don't like." — <i>Piedmont Teacher</i>

Roles and responsibilities. School district roles and responsibilities are organized differently depending on the size of the district and the leadership structure. Many roles and responsibilities vary depending on whether there is central or decentralized leadership. Despite the diversity of hierarchical and title differences across districts, when implementing a pilot, there are common responsibilities that must be covered. Sometimes, in small districts such as Piedmont, these responsibilities fall to a single principal or superintendent. In larger districts, there are many levels of decision-makers who must get involved. The common responsibilities as determined by the research team are as follows:

- ◆ Identifying potential learning technology products
- ◆ Vetting of potential products
- ◆ The ability to approve the recommended pilot product(s)
- ◆ Data analysis and evaluation

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- ◆ Fiscal oversight and compliance with district and/or state purchasing policies
- ◆ Liaison between districts and vendors
- ◆ Identification of district needs
- ◆ Oversight of product alignment with district needs and curriculum
- ◆ Oversight of implementation fidelity—ensuring that teachers are using the product in class at the agreed-upon dosage
- ◆ Tech support for implementing the product (i.e., uploading the software into the classroom/lab or on one-to-one devices)
- ◆ On-call tech support throughout pilot process
- ◆ Support for school/district/vendor-provided PD for teachers
- ◆ Budget approval decision
- ◆ Timeline management and integration into the classroom and school year calendar

The following findings are based on participant comments about innovation, collaboration among people of varying roles, and the organizational structure of districts.

Table 10: Roles and responsibilities findings and quotes

Findings	Quotes
Innovation comes from everywhere; schools differ in protocols for implementing new ideas/products based on whether the idea came from a principal, teacher, or district administrator	"... the fun thing about DCPS is that innovation pops up every which way and then... somebody will say, like, 'Come see this great thing that we're doing and it's a scale up from everybody else.'" — <i>DCPS District Administrator</i>
Collaboration among district departments (i.e., curriculum, finance, etc.), as well as between teachers and administrators, is crucial in making effective purchasing decisions	"That's why Jeff and I work so closely together. Every week, he lets me know if something is coming up, what I need to understand because I'm not a teacher. I'm on the business side of the house. He's taught me a lot about curriculum and instruction. That... to me, the collaboration between the departments is crucial in having effective procurement." — <i>Vista District Administrator</i>
Teachers share their expertise with each other and help each other out	"Frank is my mentor teacher. Basically everything I do here, feedback-wise, I discuss with him, and I know he's constantly sending emails back and forth. He tries to keep me out of them a little bit. I feel a little bit overwhelmed right now. I know he's constantly sending her emails with different feedback." — <i>South Fayette Technology Teacher</i>
Districts differ in their preference for implementation strategies: top-down centralized administrations versus bottom-up decentralized administrations	"Obviously, what we need is for the schools to understand what we're trying to do and to enforce that at the school level, but I think it's a very difficult thing to monitor... I don't want to stifle innovation because what that will mean is that innovation will keep happening; they'll just take it underground. It'll be harder for us to find it. That's not what we're trying to do. That won't help anyone." — <i>Fulton District Administrator</i>

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Timeline. The timeline constraints of this project were a challenge for districts. Because of the timeline requested by the research funder, pilots had to be implemented during the spring semester of the 2014-15 school year. After they received and obtained pilot funding, most districts were only able to get the product up and running mid-spring and did not pilot for as long as they would have liked. Several districts have plans to extend the pilot into the 2015-16 school year to continue to evaluate the product (see the epilogue for district next steps). Teachers focused their time this spring learning the product and trying to implement it with fidelity. The limited timeline prevented many districts from making accurate evaluations of product effectiveness. It is important to note how much of an effect the timeline of the Pilot-to-Purchase Project had on districts. Most districts prefer to have a longer period to try out a pilot product or are constrained to piloting during a certain time of the year because of budget approvals. We created an model timeline based on what districts expressed was the best way to implement a new pilot to sensibly evaluate a product (Appendix K).

Table 11: Timeline findings and quotes

Findings	Quotes
The timeline for pilot implementation this spring was quick; some teachers were given short notice for planning classroom implementation	"...it's always challenging to roll something out mid-year, and without having it from the very beginning of the year. It was definitely a hurdle to implement this year." — <i>DCPS School Leader</i>
Skepticism about whether there will be academic results	"The longer you can pilot, hopefully, you start to see a truer picture of what's really going on. In a perfect world, that's what I'd really like." — <i>Vista Technology Resource Teacher</i>
The timeline was not ideal for districts, as many teachers and administrators mentioned that they prefer to implement pilots at the start of the school year; the spring semester is a difficult time of year to start something new	"I'm actually thankful that we got to rush this in and put it in at the end of the year because it shows me all the things I don't want to do again. I'm sure that's something that you guys talk about, too. If I had to do it over, that would be my first do-over, would be, 'Hey, let's get together in August and roll this out in September,' so we can pull that all the way from the beginning of the school year, maybe all the way to the late spring. Really see what we have here." — <i>Vista Technology Resource Teacher</i>

Process—Discussion and Recommendations for School Districts

Discussion. The process for conducting pilots is complex, with many variables influencing how school districts conduct pilots, including the needs of students within districts, district budgets and timelines, academic calendars, the bureaucratic structure and size of districts, and existing structures surrounding teaching and learning, such as curriculum and bell schedules. Despite the involvement of districts of varying attributes and goals in this project, numerous commonalities were observed across the districts. In addition, some research findings are unique to particular districts. This discussion highlights the researchers' interpretation of common findings.

One major area of concern for all districts was budgeting for pilots. The findings suggest the people most knowledgeable about budgetary processes, policies, and constraints that may affect a district's ability to adopt a digital product work centrally within school districts and therefore are not as close to the actual product implementation process. School district size also has an impact on the district's ability and willingness to pay for a pilot; larger school districts often have more barriers prohibiting them from accessing funding. While in many districts the budgeting decisions to conduct pilots are

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made centrally, teachers in some districts find alternative ways to fund programs for their classrooms without using district funds. Budget calendars often directly affect the timeline for the adoption of new products and whether there is funding to support a pilot.

Before making a decision to pilot a product, district personnel should take the time to identify district needs, engage in research to evaluate products that could address district needs, and engage stakeholders in discussions of student needs and how educational technology products might be used to address needs. Some districts engage multiple levels of stakeholders in conversations, including school-based and central administration as well as classroom and non-classroom personnel, before piloting. In other districts, conversations are stratified and the decision to pilot is driven by central administration in a top-down fashion or classroom teachers in a bottom-up style. Districts often strongly support either the top-down or bottom-up process to the exclusion of the other. For example, Fulton and DCPS support the bottom-up process of piloting technology and tend to shy away from centrally mandated decisions, while the West Ada and Vista school districts see teacher-led pilots as a nuisance and strongly prefer centrally made pilot decisions. Regardless of whether pilots are initiated in a top-down or bottom-up manner, taking the time to identify goals, plan the pilot process, and engage stakeholders is critical to pilot success.

The primary goal for integrating technology into classrooms is student improvement, particularly as measured by state or district metrics. These metrics include state or standardized tests, district benchmark tests, student scores on classroom assessments, and product usage data. Districts are interested in products that not only improve students' scores but are also engaging for teachers and students. District administrators want products that learners at a variety of skill levels can learn from and can be individualized to students' needs and skill levels. Teachers want products that are engaging, teach students content, and improve skills.

In addition to choosing products based on their perceived ability to improve student test scores, districts select products that "best" fit the existing standards and curricula. While districts rarely find a program that is an exact fit, programs that offer flexibility to teachers and to administrators are favored. Teachers often attempt to adapt use of the program to align with existing content and school calendars or lessons. The better aligned a product is with the curriculum content standards for the district and/or state, the better teachers feel about including the product in their instruction.

To successfully evaluate a product during a pilot, administrators and teachers often set goals for product usage. However, there is also concern about overuse of particular products that can lead to burnout and dissatisfaction. Teachers use multiple products to address students' varied learning needs and supplement or complement education technology products with other learning strategies or teaching tools within their lesson plans. By doing this, teachers bridge more traditional modes of instruction with lessons using education technology programs.

Another important aspect of the ability to appropriately use and evaluate a particular program in a pilot is high-quality professional development. Teachers favor in-person PD that includes hands-on training and tangible takeaways that can immediately be applied in the classroom. Follow-up support and online training are also noted as useful once the teachers are using the product. The importance of professional development and teacher proficiency in using the education technology product is also a key finding of the quantitative analysis presented later in the report, where students who rated their teacher as less knowledgeable in using a particular program also reported less favorable results of using the program across a range of measured dimensions. While, in most instances, teachers involved in the study indicated that they received adequate professional development as part of the pilot completed for this study, they also expressed the notion that more training is better.

When discussing the timeline, much of the focus was on the product implementation timeline, including when teachers were notified and trained and when the product was introduced to the students and integrated into the classroom. Although this pilot timeline was short from award to implementation, all districts were already engaged in conversations about products that could meet district-identified student learning needs. Conversations also centered on how to pilot products on

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short notice during a time of year that was not complimentary to academic or budget calendars. Pilot alignment with academic and budget calendars are critical for districts to make decisions about the impact of products on student learning, whether the product meets student outcome goals, and the ability to purchase the product for the following school year.

Recommendations for school districts.

Develop a procedure for piloting education technology products that includes:

- ◆ Pilot and budget timeline
- ◆ Framework/metrics for evaluating the education technology product
- ◆ FAQ for pilots and budgets that provides information to developers, administrators, and teachers
- ◆ A statement of needs that includes short-term and long-term district goals to be considered when selecting a product to pilot
- ◆ A plan for providing professional development and training on using the product for teachers and administrators
- ◆ Refer to pilot planning checklist (Appendix F) for further guidelines

Engage in transparent communication with developers to inform them about:

- ◆ District goals and needs
- ◆ Budget restrictions
- ◆ The curriculum calendar
- ◆ Professional development needs

During the pilot, evaluate whether the product is pliable enough to meet student and teacher demands. Reference available rubrics that can be used “as-is” or modified to meet the needs of the district. See the appendix for examples of rubrics used by the Fulton and West Ada school districts.

Assign a point person during the pilot process for correspondence and IT support concerns.

This could be a pilot “leader” or “captain” and could be a technology teacher, principal, media specialist, etc., based on the district structure

Evidence

“Something we really strive to do is to have proof points within our own district to be able to say this is something that works here.”

—DCPS District Administrator

Evidence refers to the information that districts collect to evaluate a pilot. The findings presented here examine the types of information that districts collect and how districts conduct analysis utilizing data to determine product effectiveness. Districts evaluate products in qualitative ways as well as through quantitative measures. The three themes discussed in this section are evaluation and data analytics,

Evaluation and data analytics. The evaluation and data analytics theme focuses on the types of data, largely quantitative, that districts formally collect during the course of a pilot to use when determining product effectiveness. Often, school districts attempt to measure gains in student achievement that could be attributed to product usage. “We’re trying to figure out what data ... we need to capture and what format in order to run statistical analysis on it to see if the program’s effective...” said a West Ada administrator, highlighting both the challenge of determining product effectiveness and the belief that, if they just figure out what to measure, it should be easy to determine product effectiveness from a few simple data points. However, conducting a valid quantitative research

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design that can demonstrate student growth attributable to the use of a particular product is extremely difficult. Because of this difficulty, supplemental qualitative information, such as teacher feedback, student feedback, and teacher observations of students using the program, is also incorporated in determining the effectiveness of programs.

Data from programs have other uses besides the determination of overall program effectiveness. Teachers and administrators often use data from products to track student learning or progress on standards. In this capacity, teachers and administrators expect immediate feedback and access to data, and they want education technology companies to provide data that is easily retrieved, is in a format that is easy to use, and can be integrated with data from other sources.

Validity of quantitative analysis conducted by school districts. In this section, we examine the research designs employed by school districts to attempt to measure student growth attributed to program use. The strengths and weaknesses, including threats to the validity of findings, are presented for each type of research design. Additional threats to validity are also discussed at the end of this pullout.

School districts used three types of research designs to measure student growth. First, school districts compared the test scores of product users to the scores of those not using the specified product or using a different product. Officials in West Ada utilized this strategy in comparing users to non-users. The District of Columbia Public Schools used the strategy in a previous evaluation of ST Math and are planning to compare Newsela PRO users to Achieve 3000 users to evaluate the effectiveness of the two programs. The strength of using a comparison group is the establishment of a plausible baseline for understanding what would have happened in the absence of the particular education technology program. While this strategy seems relatively straightforward, numerous factors affect the validity of findings using this strategy, generally surrounding the comparability of the treatment and control group. Creating comparable treatment and control groups is especially difficult in educational settings, where treatment and control are often assigned at the teacher or classroom level rather than with the individual students. When this is the case, particularly when only a few teachers' students constitute the control or treatment groups, the validity of the findings are in serious jeopardy, as it is impossible to distinguish the effects of particular products from the impact of the particular teachers. There is little or no evidence from either the interviews and transcripts or the documentation provided by districts that those conducting the evaluation appropriately considered the comparability of the treatment and control groups when conducting this type of analysis.

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Table 12: Evaluation and data analytics findings and quotes

Findings	Quotes
Bottom line for many districts is showing growth on district/state assessments (as opposed to assessments contained within the program), as it is important to verify claims made by vendors by using a product with a district's own students and assessments	"We're getting to the point now where we can dial in on exact programs and figure out what really works for what, then do some recommending and some resourcing on those programs. I think that's the big difference, from a very gross to a very finite ability to evaluate." — <i>West Ada School Administrator</i>
Administrators expect to get immediate feedback/data from programs and use data from programs as another piece of information when examining student progress and want data to be in a form that can be easily retrieved, used, and integrated with other sources of data	"I also think that that's part of culture, too... that we are looking into data all the time. We need access to it all the time." — <i>DCPS District Administrator</i>
Administrators and teachers use a variety of information on products to make final decisions, with different types of data emphasized depending on the goals for the product. Teacher opinion is often based on student observation. "I started to see a transformation."	"[Decisions on which programs to keep are] based on what it's going to offer for our students. If it's a previous program, how much was the program utilized in the building? Were there challenges with the programs? Did the students have challenges? We talk with our students. We talk with our parents on how they utilize it at home. We also talk with the teachers on how they incorporate it into the classroom to help us make a sound decision in regard to if we're going to continue with the program." — <i>Fulton School Principal</i>
With a short time period, districts do not expect to be able to measure student growth well on external assessments	"Now, granted, it's not a huge time to really make any concrete... I think a lot of people, that was their comment. I wish I had more time with it, but it's okay. That's the way it worked out. We knew that. For me, that would be, at least from a data standpoint, that would be what I would be looking at." — <i>Vista Technology Resource Teacher</i>
Concern about the validity of matching product use to external test results. Are students taking tests seriously? Do skills learned on the product align with what is asked on external tests?	"I don't know, quantitatively is harder. Yeah, it just depends on seeing what type of growth they've had. ... STAR ²¹ ... it really doesn't align to a lot of the things that are on the star map that we've seen so far in the short period of time; it's hard to tell." — <i>Vista Teacher</i>

A second type of evaluation that districts use is pre- and post-tests to examine student growth, without the use of a control or comparison group. South Fayette used this method to examine student growth in math, computational thinking, and attitudes toward computer science. South Fayette, in particular, was interested in differences in growth between male and female students. One advantage of this method is that, without a control group, the treatment can be given to all students in a particular school or grade level, as was the case in South Fayette. One issue with the use of test score gains without a comparison group is the inability to definitively attribute gains to the use of a program

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or product because other events and learning experiences that happened with the passage of time could also affect student growth. If the main objective of the analysis is not to determine whether the program resulted in gains for the treated sample but to determine whether gains were different for male and female students, not having a comparison group of students who did not use the program is less of an issue. However, there still could be factors outside of program use that contribute to differences in boys' and girls' rates of growth, which cannot be accounted for without measuring growth in similar groups of male and female students not using the program. Figure 1 below shows an example of a graph of pre- and post-test scores on a mathematics assessment given to middle school students in South Fayette.

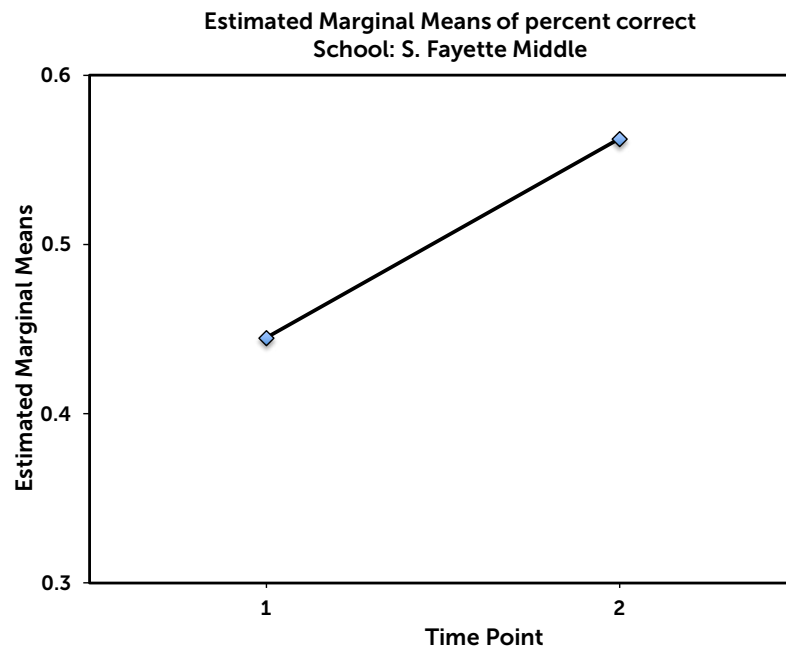
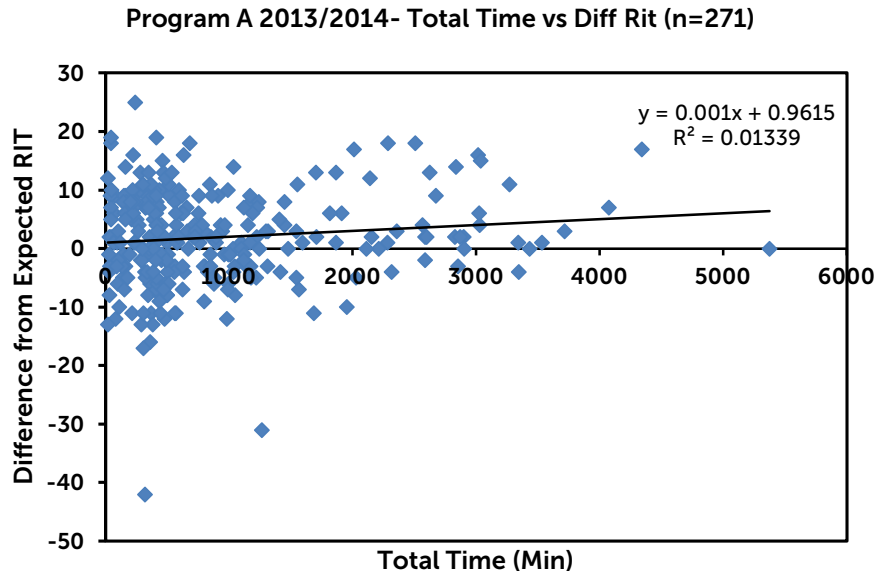


Figure 1: Example of pre- to post-test change in middle school math from South Fayette

A third type of analysis employed by districts is examining correlations between product data and student achievement data on external assessments. West Ada and DCPS both employ this method by looking at how product usage relates to student achievement. West Ada examined how time spent using the program related to student growth. DCPS attempted to examine whether there were usage thresholds for programs to produce certain results. They want to know how much time to spend on a program to produce a certain test score gain. Again, this design seems relatively straightforward. District officials want to be able to show that students who spend more time on a program or complete more lessons within a program show more improvement. The problem with this approach is that there may be other factors related to time spent on the program and test score gains. In West Ada, for example, students are expected to complete a certain number of lessons per week on ALEKS. It seems entirely possible that lower-performing students will take longer to complete the required number of lessons. There are a host of other unaccounted-for factors that also could affect the relationship between time and scores. Simple correlations are not sufficient to establish a causal relationship or to show the lack of a causal relationship between usage of a technology product and student performance. Figure 2 shows a graph produced for the analysis of ALEKS in West Ada depicting the lack of correlation between time spent on the program and student growth.

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The correlation above had non-significant results with $p = 0.057$. $N = 271$.

Figure 2: Example of a correlational approach examining the relationship between time spent on the program and math gains from West Ada

In addition to the research design, educators involved in the study were concerned with the alignment of educational technology products to external standards and assessments as well as the validity of external assessments in some cases. For example, in Vista, one teacher involved in the ST Math pilot explained her skepticism in seeing improved test results: "A lot of the things that the students are getting in ST Math I don't think are gonna directly move over and show growth on that star map." In several districts, educators recognized that students place varying amounts of importance on external tests and that teachers can influence whether students take tests seriously. "I know for me STAR data showed that my students made a lot of gain in math, doing ST Math. I also set it up in my class that it was important to take the test seriously, that we used it to analyze whether kids were going to receive other remediation programs..." In South Fayette, educators questioned whether the assessments used to test growth were age appropriate. All of these factors, relating to whether the tests accurately measure performance related to use of a particular program, have implications for the validity of the findings.

In short, regardless of the method used, designing pilots to adequately determine the product's impact on student outcomes is very difficult. Threats to the validity of the design should be considered and minimized wherever possible. Results from designs that have clear threats to validity should not be given much weight.

Student feedback. One focus of this research that differs from the literature and related research is the inclusion of the student voice. We conducted focus groups with students as well as with teachers and administrators because students are the ultimate end users for a program and their point of view is valuable. Students were able to provide extremely sophisticated feedback about their experience in these pilots. Students explained in depth their opinions on product usage, the pilot process, interactions with teachers, and technology glitches. Some of the most interesting comments were made about how valuable the students believed their feedback was to the pilot process. Several students commented that they did not think that their feedback was very influential on the process but that it should be because they are the end users. The student commentary was much more mature than we expected, and this is a vital finding of our research. Students' opinions and suggestions

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should be considered when piloting a new product, as they are the ones experiencing it and are able to communicate their thoughts. Students may not realize how effective a product is, but they can describe how they have improved. Students made several sophisticated points about their own learning and growth. The following findings relate to how student feedback is collected in districts and how students feel about giving their feedback throughout the process.

Table 13: Student feedback findings and quotes

Findings	Quotes
Many students provide unsolicited feedback to their teachers about what they like and dislike and challenges encountered while using the program	"I think that if we do give our opinions on it, maybe next year when we move on to the next grade, they can teach the kids who are coming to seventh grade about it [00:48:00] and tell them, and they can keep our opinions and they can maybe improve the website for the next grade that comes in." — <i>Piedmont Student</i>
When teachers and administrators collect feedback from students, it is through informal conversations; there is rarely a formal process for gathering student feedback when making procurement decisions about a product	"Teachers... we give feedback to each other and it's in a very informal way. It's nothing that's very formal. I know I did a survey couple of days ago on the pilot. There's no formal data collection and undoubtedly we just listen to what the kids are saying and their experience." — <i>DCPS School Leader</i>
Students believe that their feedback is important to the process but do not always feel that their teachers and administrators listen to them; students realize that other factors are considered alongside their feedback when making decisions (i.e., test scores)	"Our opinions are kind of key in it because we are the ones using it." — <i>West Ada Student</i>
Districts have not regularly collected formal feedback from students and recognized this as an area for improvement	"Today, like yesterday, I've talked with a group of students. That wasn't something that we set out to do. To be honest with you, that's probably something we could do better as administrators. We could get more qualitative feedback from students. I think because of the nature of school systems, we're more focused on the quantitative data. That is something that I think would be probably more beneficial in deciding whether or not this is a program to expand or to enhance to get that soft, tangible information from the students." — <i>DCPS District Administrator</i>

Teacher feedback. A teacher in South Fayette asserted, "I think if you don't listen to teachers and students, it's a mistake." Teacher feedback is an essential component of evaluating a pilot. Teachers provide their feedback to administrators, mostly informally, about their experience implementing a pilot in their classrooms. Administrators learn about student engagement, perceived product effectiveness, and challenges of product usage from teachers and use this information to make changes or decisions. A teacher at Vista expressed that it is important to take initiative and offer feedback: "It's one of those things where just having teachers be a little proactive on their part and letting the administrators know that, if you're going to do this, this is what I need to be successful so the administrators are in that loop, too." Administrators further described that collecting teacher feedback and being responsive to their concerns is important in ensuring teacher buy-in for the pilot. A Piedmont principal commented, "It is so important that they are going to be behind it because, if they are the ones in the classroom ... we are not in every classroom. They are the ones talking to students. They are the ones in the program... If they don't really believe in the program, they won't find out what's best about it. They can think it, whether you want them to or not. Having their buy-in and their backing the product is huge."

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Table 14: Teacher feedback findings and quotes

Findings	Quotes
Feedback is mostly collected qualitatively through informal dialogue with administration; sometimes there are email check-ins or face-to-face conversations, but often, there is no formal feedback mechanism	"With me, it is talking to them. It is not necessarily in interview format... With us, it is just walking down the hallway and asking, 'What do you like? What do you not like?'" — <i>Piedmont Superintendent</i>
Teachers and administrators value this informal dialogue	"90 percent of the time, if something's working and we've used it in a classroom and it's worked for us and we've voiced our opinion that we want it, usually they ... we feel that that's going to be heard, and we usually have it." — <i>Piedmont Teacher</i>
Administrators feel that teacher input is important, but other important things must be factored in as well	"I think if I were to come back and say the teachers hate it and the kids aren't using it that that would put a standstill on it. What we feel it's doing for our kids is important. They're going to look at ease of use and cost, and all of that's going to be factored in." — <i>Vista Teacher</i>
Teachers talk with other teachers about their feedback before bringing it to the administration	"I think it's pretty tiered in our district. Our administration will listen to any of us. I don't think there is any doubt. Any one of us can go to them with any concerns that we would have or any discussion points that we may have. However, I think it normally plays out that we discuss it here [between teachers]." — <i>South Fayette Teacher</i>
Teachers often try to let administrators know how the students are feeling as well as how they are feeling	"[The students] immediately felt like this is something I can do; this is something I can do independently. I was communicating that to my administrators that I liked this, that I think this is really appropriate for the group that I'm working with." — <i>Vista Teacher</i>

Evidence—Discussion and Recommendations for School Districts

Discussion. Districts collect considerable data, both formal and informal, during the pilot from a variety of sources, including quantitative data from tests given to students and occasional surveys and qualitative data in the form of verbal teacher and student feedback. Improved student outcomes on district and state standardized tests appear to be the benchmark or measure of "success," although few districts have a plan for how to appropriately measure improved student outcomes. Because of inadequate planning surrounding quantitative analysis, most of the quantitative results that districts view as proof of whether a program worked or not are likely to be invalid. Another interesting finding regarding quantitative analysis is that districts do not know how much growth to expect in students. In the current study, five of the six districts did not articulate specific improvement goals for students. Product data are also used to determine student improvement but are often looked upon with skepticism unless validated by other assessment results. Districts also examine teacher and student usage rates of programs to learn about levels of engagement.

The findings suggest that district administrators generally regard teacher feedback as extremely valuable. Teachers' input about a product often makes or breaks the success of a pilot. Collecting teacher feedback either formally or informally is crucial in understanding how the pilot program worked in the classroom. Fulton teachers had the opportunity to participate in formal discussions regarding education technology materials, but it is the only district that reported having a formal mechanism for discussion. Teachers believe that their feedback matters and often are frustrated when they are not heard or consulted prior to making changes.

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Regarding both quantitative analysis of student test scores and qualitative understanding of teacher and student feedback, this analysis suggests that there is inadequate planning surrounding what types of feedback to use when determining product effectiveness as well as how to appropriately conduct the analysis. This has serious implications for successful piloting. Despite spending time and effort to conduct pilots of products to inform purchasing decisions, sufficiently rigorous analysis of product effectiveness in achieving goals often seems to be of secondary importance.

Recommendations for school districts.

- ◆ When student assessment outcomes are considered the benchmark for success, districts should develop an evaluation plan and research design to validly measure the impact of product use on student outcomes.
- ◆ Pilots should include formal mechanisms for collecting student and teacher feedback.
- ◆ Teachers should proactively provide their informal feedback to administrators as well as letting them know what students say.
- ◆ Administrators should value teacher and student feedback in the process of evaluating a pilot program.

Procurement

“Number one, is the product effective for student achievement? Obviously, that's huge, but is it even cost effective? We could have buildings maybe piloting a project for a year, and there's absolutely no way we could ever afford to purchase it after that year. There were a lot of things that we needed to think about before we agreed to do a pilot.”

—West Ada District Administrator

Procurement involves how and the extent to which districts use information they collected about the pilot to influence product purchasing decisions. The Pilot-to-Purchase Project is meant to focus on how districts move through the process of implementing a new education technology product to make a purchasing decision. This section focuses on what happens after the pilot to move toward a purchasing decision.

Post-pilot expectations. After the conclusion of the pilot and evaluation of the effectiveness of the piloted product, decisions must be made about what to do next. As a pilot progresses, there are some new directions that emerge or obvious outcomes. Teachers and administrators alike commented unprompted on what decisions they expected to be made regarding the product. In some cases, the decision was that not enough time had passed to make an informed decision regarding the effectiveness of the product, so they planned to continue the pilot into the summer or the next school year. This was the case in the District of Columbia Public Schools, Piedmont, and Vista. Another decision was to expand the use of the piloted program to other grades or schools. This seemed to be what most individuals in South Fayette expected would happen. In addition, many teachers in particular were looking forward to modifying how they used the product in the classroom, expanding its use to new projects and new challenges or further incorporation into existing curricula and standards. Additionally, in some districts, there was quite a bit of uncertainty regarding further use of the product. This was the case in West Ada, where teachers spoke of the product with high regard, but the analysis of product effectiveness by the central administration indicated a statistically significant but weak impact on student outcomes.

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Table 15: Post pilot expectations findings and quotes

Findings	Quotes
With a successful pilot, administrators and teachers expect to continue use of the program but often do not explain in detail the steps required to continue program use	"I think that it would be self-perpetuating, that teachers would be engaged in it and students would be engaged in it, and that, in addition to the students' outcomes, results, and usage in the classroom ... you also see with this particular program engagement in current events as well as the other things that we've been talking about." — <i>DCPS Teacher Leader</i>
Use of the program will expand to other grades or subjects that were not previously using the program; for some districts, scaling up presents additional challenges such as changing bell schedules and ensuring capacity for technology	"I think one of the things that the teachers will start changing more is that they'll realize that they can use things like Scratch in their classroom, especially because we'll have more computers available to us next year. I think we're going to see a lot more of that. I think that, when they assign projects, it might not be a book report anymore; it might be a Scratch project. There are a lot of teachers who do that." — <i>South Fayette Teacher</i>
Use of the program is expected to improve with continued use, as teachers and admin will be more familiar with it; alignment to curriculum and student results are expected to improve as well	"If this pilot is successful, what I plan on doing is, like I said, I will have the basic curriculum that we're following now... A little girl asked me a question today, and it clicked in my head... that would be a perfect challenge right there. I would have these add-on challenges. It would be basically follow the curriculum close, not exactly to a T, but follow it close. Stay on the same page of it. Give them these more challenging challenges." — <i>South Fayette Technology Teacher</i>
Three of the districts have negotiated longer trial periods beyond the end of the official pilot period for this project to be better prepared to make a decision about the product	"They [Achieve 3000] also know that it is a short time, but they have given us the ability to utilize it over the summer if we want." — <i>Piedmont Superintendent</i>

District procurement and purchasing policies. The research goal of the Pilot-to-Purchase Project is not only to determine the process that school districts employ when piloting a new technology learning project but also to understand how they use the information they gather from piloting to drive procurement decisions. Throughout the focus group and interview process, we collected more information about the piloting process than we did about the procurement process. This is likely because only select individuals in each school district (usually central office administrators) are involved in purchasing decisions. To fill this knowledge gap, the research team conducted follow-up interviews with administrators from the six participating school districts who were directly involved with product procurement. These interviews unveiled interesting details about procurement processes in the six districts, as policies differed widely. For example, there is a very strict purchasing limit in the state of Pennsylvania that restricts South Fayette's autonomy to purchase new products. If an educational technology product exceeds \$19,000, a bidding process is required. To receive the desired product, administrators must be extremely specific in the bid for a product so that they solicit the correct vendor. There are some similar policies in other districts and states as well. The findings below address restrictions on purchasing decisions such as purchase limits, state or school board policies, and unique budgeting timelines.

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Table 16: District procurement and purchasing policies findings and quotes

Findings	Quotes
Districts often have restrictions set by the state or the school board for purchase limits	"...how we categorize pilot studies [is] basically like new programs or strategies or materials or equipment that are introduced on a trial basis... really for potential district-wide expansion. Typically, they can be implemented on a limited scale, for a determined amount of time, or under a specific evaluation design...That's what we consider a pilot. That's more where we've gone to the board, the board has approved that we can do this because there's money involved, and the money is more than \$10,000, and so we go to the board to get the approval of that."— <i>West Ada School District Administrator</i>
If there exist no purchase limits, districts are free to buy whatever they want but must get budget approval from the school board	"The easy part for me is that curriculum materials by Idaho code do not require any bidding process. It's essentially you guys decide what you need, and you go get it as long as the budget is there." <i>West Ada School District Administrator</i>
The process to get funding for new education technology products in the yearly budget is long and time-sensitive; each district has a unique budgeting timeline	"A lot of times [the administration] start planning now [in May] for what they're going to purchase next year. It's not just, 'Let me go and buy something today.' So, you kind of have to start having those kinds of conversations with them prior so they can spend their money. They tend to write a proposal for what they'll use their monies for prior to the school year starting."— <i>Fulton Teacher</i>

Procurement—Discussion and Recommendations for School Districts

Discussion. During the process of the current research, we learned that many of the districts did not gather sufficient data to make a strongly informed procurement decision for the pilot. Districts plan to continue to evaluate the products and make a procurement decision in the near future when they have more information. The findings presented in Table 16 are indicative of districts' expectations for procurement and existing procurement policies, not of what happened specifically in this pilot.

Findings suggest that school districts do not always have an established plan for procurement when pilots end but often expect continued use of the piloted product. Districts frequently negotiate to extend the pilot length to have more time to make procurement decisions. Teacher and student use of the program is expected to improve over time, after the pilot period, once they overcome the learning curve and troubleshooting issues. Additionally, as familiarity increases, the program is expected to become seamlessly integrated into the curriculum and give an opportunity for prolonged engagement.

The purchasing process varies by district because budgetary and procurement policies vary depending on the state, the size of the district, and any exemptions written into school board policies. School districts often have very strict purchasing guidelines and bidding procedures, but we found that, in some districts, curriculum materials and education technology products are exempt from these processes. When this is the case, districts do not have a purchasing limit or rules to follow; the only requirement is school board approval of the budget. Teachers involved in the pilot implementation are often unaware of the purchasing procedure throughout the process. The budget and procurement knowledge of school-based administrators appears to depend on the size of the school district and the complexity of the budgetary guidelines.

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Recommendations for school districts.

- ◆ School districts should ensure that the length of a pilot provides enough time to make procurement decisions about a program.
- ◆ Post-pilot expectations should be communicated to all stakeholders before beginning the pilot and should incorporate a plan for evaluating the product.

Additional Findings

“...the beautiful thing about this pilot is that it brought two teams of teachers together that wouldn't have the opportunity to share and collaborate so closely... Our teachers actually helped each other and collaborated with each other and offered advice. That was beautiful to see. I think that was unexpected.”

—South Fayette Director of Technology and Innovation

Several important themes emerged through the research that does not fit neatly into the preceding process, evidence, or procurement categories. Process, evidence, and procurement follow the chronological progression of a pilot as it develops over time from implementation to data collection to making a purchasing decision. However, not everything involved in a pilot fits into that timeline. The following research findings do not occur chronologically but are just as important and perhaps more intriguing.

We learned what advice administrators, teachers, and students would give to education technology developers, as well as common challenges encountered throughout the process. Participants stressed the importance of effective communication and relationships throughout the pilot process with all stakeholders. We heard about how districts are working to develop their pilot processes based on comparisons to other and/or past pilots in the districts. Districts experience moments of discovery by way of unexpected insights into their processes. Last, these findings describe interesting aspects of teacher-student dynamics and considerations for the use of technology.

Advice to education technology developers. District administrators, teachers, and students alike shared their ideas about how education technology developers can improve products and district relationships. One district administrator in West Ada stated, “...Ultimately the schools are the end users, the students are the end users, and the teachers. If they have issues with it, that’s when you want to listen to it and say, ‘Okay, if you could design this product or make improvements, what would you change?’ Really good vendors are responsive to those requests.” Students also had many specific comments for education technology developers that were valuable, as students rarely interact with developers or vendors. Students’ advice was particularly important, as they made many of the same comments as teachers and administrators. Students suggested that developers should be sure to make the products engaging and easy to use. They also had very specific suggestions about product improvement because they had more time interacting with the program than both teachers and administrators. For example, one student in West Ada suggested that there be an audio component in ALEKS because students have “different learning styles... some people will, like you said, learn better from hearing. Some read better, and some can see a visual or a diagram of it and it just clicks in their mind.” This student articulated that different students have different learning styles and that they would benefit from more audio and visual aspects. This is a very sophisticated insight that should be shared with vendors. Student feedback on these specifics would be very valuable for vendors to hear because they rarely get suggestions straight from the end user.

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Table 17: Advice to education technology developers findings and quotes

Findings	Quotes
Both teachers and students in multiple districts say that it is important to keep in mind that kids are using the programs	"...it's become very important that, if a developer is going to make a program for a district, they really need to work with the teachers and with the students to learn who they are] building this for. What are their needs, and to talk to the teachers to show the teachers ahead of time: 'Here's what we develop. As a teacher, how would we change that?' There's somewhat of a disconnect between creating a product and implementing it for an actual student and for education." — <i>South Fayette Director of Technology and Innovation</i>
Both teachers and students have specific recommendations about product improvement	"I think that they should ask what would catch our eye and might keep us into it, things that they could incorporate into their website before they even show it to us that would help us, that they thought... not even seeing the website yet... what we think would already help us if it was in there." — <i>Piedmont Student</i>
Teachers and administrators both want products to be aligned to standards	"...because if we're going to align things vertically for the Common Core, I think it behooves the ed-tech companies to make sure that you use the same language ... comparing apples to apples." — <i>DCPS Assistant Principal of Literacy</i>
Teachers want to improve ease of use of the program and receive more training and support, particularly at the startup of the pilot	"I think it would be the same, really, especially while we're just starting out. The easier we can make it for teacher to enroll, to monitor data, to run reports and then interpret the reports, the more [we're] getting the help that we need." — <i>Vista Teacher</i>
Administrators want good relationships and productive interactions with education technology companies and would like companies to cater to a district's specific needs and negotiate cost	"I think, actually, the one thing I would want to let software developers, companies, salespeople know is I think actually they can end up losing business with a district that operates like our district if they don't understand our goals and how we do things. I think what happens is sometimes we go, 'Oh, that salesperson. They are kind of sneaky. That's an underhanded move.' I know I don't like it." — <i>Vista District Administrator</i>

Challenges. Many challenges arose during the pilot process and are discussed throughout the report in appropriate areas. However, this section summarizes and highlights the main challenges that participants repeatedly expressed as especially challenging during the interviews and focus groups.

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Table 18: Challenges findings and quotes

Findings	Quotes
Timeline of mid-year implementation created challenges for program usage, data collections, analysis, school schedules, testing	"...In terms of timelines... we've got going with it [the pilot] probably after spring break in earnest, and that's always just a hard time, especially with the PARCC [assessment] window at the same time." —DCPS School Leader
Cost of sustaining a product is a huge challenge; similarly, the biggest barrier to the acquisition of a product is finances	"Cost was always an issue. He told me not to worry about it, but it always is. I mean, the way I look at it is, if I am not positive you can sustain it over a long term, it bothers me. Like I mentioned a while ago, if you can't afford it over time, and I always try to think of that in the background. I want to find the best product we can utilize but still be able to ... if it is working, continue using it... you don't want a product that is great and doing exactly what you want it to do and then, after five years, you can't afford it. That is an issue." —Piedmont Principal
Teachers emphasized that IT support for the program should be easily accessible from the vendor as well as within the schools	"A district needs to build internal capacity and support it to become independent of the vendor. Then the vendor needs to have a resource line of connection to that person to be able to troubleshoot effectively." —Vista District Administrator
Professional development is critical; without adequate PD, so many other challenges arise (i.e., tech problems, lack of student engagement and teacher buy-in); students experienced more challenges when teachers were not properly trained and could not help them through obstacles	"It's very stressful as well... most kids are stuck in stretchy blocks... When we ask for teachers' help, they're like, 'What are you doing?' They don't know what we're doing. Then, they can't even help us. Not even the teachers." —Vista Student
Relationships with vendors are often stressful; there needs to be a main point of contact	"No product that is made is going to be perfect for every district how it is made... if they need to change this or modify this or something, you can utilize it this way; you don't have to necessarily do it this way. That helps. Having that relationship, that helps greatly when you know that you can change it." —Piedmont Principal

Communication and relationships. The importance of good communication and relationships emerged as an unexpected finding throughout the research process. Communication among all district and community stakeholders, as well as with vendors, proved vital to a successful pilot process and evaluation. Districts often employ collaboration between teachers and administrators, but not always when it comes to decision-making. Collaboration and accurate communication among teachers, administrators, and even students throughout the pilot process proved very important for the successful implementation and evaluation of a product. Teachers often are the pioneers of new pilots, and they must be able to work closely with administration to achieve wider implementation. If administrators do not collaborate with teachers or students, they will not be able to accurately understand the functional necessities for using the product in the classroom since they are not in the classroom every day. Administrators need to be honest with teachers and relay any decisions that have been made immediately so that teachers do not continue to use a product under a false

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pretense of future purchase. A Piedmont principal in described, "...after the vendor left and we were sitting around talking, one of the teachers said, 'Is this a done deal? Because if it is a done deal, we just need to know... If this is a done deal, just tell me.' To come back and say, 'No, we really need you to be honest because, if you don't like this or if there is something you don't like about it, then we need to tell the company. We are truly trying to decide what to do.'" Further, fostering positive relationships with product vendors is very helpful throughout the pilot process. If schools or districts need additional support or training, a close relationship with the vendor will facilitate this. Additionally, good relationships with vendors provide a channel for the communication of advice to developers on product improvement. The findings here indicate the importance of cooperation, leadership, and collaboration in pilots.

Table 19: Communication findings and quotes

Findings	Quotes
Good communication between administrators and teachers is seen as important; communicating expectations about what they are doing and why they are doing it promotes cooperation and buy-in	"I asked a lot of my teachers, more than probably a lot of other people do. I expect a lot in return for it... I want them to know that I value what they think and what their opinion is on things. I don't want to just throw it on them and say, 'You gotta use this.'" — <i>Piedmont Principal</i>
Administrators cite a need for good communication with education technology developers and that developers should be aware of and willing to adapt to district-specific needs	"We talked to them about some of the things we would like, and they are trying to actually mold some of their product toward what we need, which is great because they are a little bit younger company, and they are wanting to get a foothold." — <i>Piedmont Principal</i>
Many schools and districts have structures in place to facilitate discussion across levels of the education bureaucratic structure (i.e., leadership teams include teachers/principals)	"If we're doing something school-wide, we discuss it as a leadership team. I guess the final decision is made by me, but I don't really do it in a silo. It's talking about it with everybody." — <i>Fulton School Principal</i>
Teachers understand and value good leadership, which can make teachers feel less burdened or overwhelmed	"Well, they need to have a good lead person... and a good direct support staff underneath there that'll work with the teachers.... What we have here is really great. You know, Karen and the tech teachers here in the building work together really closely, and all of the original planning and work behind the scenes takes place, and then it's unfolded to the classroom teacher." — <i>South Fayette Teacher</i>

Developing the pilot process. Many districts conveyed distress over their previous experience with pilots, specifically the lack of consistency in the procedures surrounding the process of piloting. Three districts similarly expressed that they experienced a "wild, wild West" situation in terms of piloting. Teachers were bringing in different products to their classrooms and trying them out with no formalized structure for gathering or reporting data. There were no consistent points of contact for vendors, as teachers, school administrators, and district administrators were all engaging with vendors in some capacity. With the increase in the number of education technology software products in the market, the need to do pilots scaled up rapidly with initially little thought about the pilot process. A district administrator in Vista stated, "When we first approached pilots, the doors came open, and it was [bullets] before, cannonballs, pilots galore, but we didn't have a target. People were getting caught in the crossfire. I really started looking at how we were doing pilots. We had to really remap our system and approach in that." District personnel mentioned that their involvement in the current

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research project has helped them become more thoughtful about how they do things. Pilot processes are not static; they are dynamic and different for every district, and as district officials become more experienced with pilots, the process of piloting education technology products is continually adjusted. A school administrator in West Ada commented, "...the process is changing as we go because it's so different when you go digital versus paper. It's such a different practice, but I think it's evolving constantly." The recognition of the increasing need to do pilots well, with some sort of consistency or goals in mind, has led several districts to use this project to help them develop their pilot processes. They said that they are becoming more aware of what is happening in the district and working to better organize the procurement of new products. The following findings are based on what districts said about their emerging pilot processes.

Table 20: Developing the pilot process findings and quotes

Findings	Quotes
Administrators in the participating districts have used the Pilot-to-Purchase Project to develop a more streamlined way to do pilots; they have been more thoughtful than ever before about how they actually do pilots	"This pilot is helpful with our journey in really strategically thinking about how we view pilots and how we make sure there's a matrix in which we're going to measure and monitor and guide those decisions. I think, in implementation from that standpoint, [it] has helped us grow from that exercise itself." — <i>Vista District Administrator</i>
Districts have realized through this process that they need to look more closely at what their needs are and whether products actually meet their needs	"...it is forcing us to take a better look at what we need and [whether] it [meets] our needs. If Achieve does that, and then they get their heart right with price, that helps, but I think for me, it is more of... it has made us take a look at ourselves and what our needs are and does this product meet our needs. If it does, then I think we are going to be better at looking at the next product and see if it meets our needs." — <i>Piedmont Superintendent</i>
Other factors, such as the shift to Common Core/blended learning/ mastery-based learning, have played a role in inspiring districts to develop better pilot processes	"We're trying to define what even a blended learning school is because, as more and more teachers use... we really look at it as teachers using intensive data to help tailor student learning." — <i>DCPS District Administrator</i>
Districts have learned to think ahead; they mentioned that they brainstorm ideas and do research to react appropriately to new pilots	"I feel like one of the blessings is that it's coming out of our district now is the fact that we're thinking ahead. These team members are working with other principals in coming up with ideas. They may be ideas; then when something happens, we can react to it quickly. They're doing a lot of work. They're getting the pulse of what's going on in the instructional endeavors." — <i>Vista District Administrator</i>
Districts are still working on the best way to evaluate programs and the necessary metrics to analyze data	"At the end of the day, if we want to spend money on these things, we probably should have data to back it up, why we're doing it... We just want to add the one piece of our pie; our puzzle is the research part of it, the data collection, the experimental part. I think that's cool... at the end of the day, at the end of this project, that is what I hope we have." — <i>West Ada Research Coordinator</i>

Difference from other pilots. It is not a new phenomenon for districts to pilot, or try out, new programs or materials before purchasing them. Because of districts' history with piloting, we asked

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how this pilot differed from other pilots they had experienced in the past or are currently experiencing. Success or failure with previous pilots often was the inspiration for districts to continue piloting and to fine-tune their processes.

Table 21: Difference from other pilots findings and quotes

Findings	Quotes
<p>The timeline for the pilot this spring differed from other pilots; longer than demo pilots/try-outs but shorter than the ideal full-blown pilot length</p>	<p>“For us, ‘pilot’ is a term that is defined and is regulated by our board policy. In order for us to truly pilot, what we would call pilot something in Fulton, we would have to go before the school board and get approval. To Don’s point, we a lot of times are not piloting. We’re trying out. We’re going through a process to figure out what’s the best option for our students because piloting for us comes with huge budget implications.” —<i>Fulton Assistant Superintendent for Learning and Teaching</i></p>
<p>This particular pilot (for the Pilot-to-Purchase Project) gave districts the opportunity to really think about the way they do pilots and to consider their process; as a result, there was more professional development, more effort to analyze data, and more support from districts but also more pressure on teachers to faithfully implement the product</p>	<p>“I felt like there was a little pressure to do it right. Well, I don’t know if ‘pressure’ is the right word. You have a certain amount of time that you have to get in during a week. It’s the only pilot, of anything that we’ve done here so far, where they put parameters on how much you have to engage in it in a week. I don’t remember how much it is. By accepting the pilot, the teachers made a commitment to that amount of time, which I think would make piloting anything more successful; if you have a commitment, I will use this amount of time during a single week.” —<i>Vista Digital Learning Coach</i></p>

Process discovery. The process discovery theme consists of categories of findings for which districts usually do not plan for a priori. These are themes that we, as researchers, did not identify initially but emerged during the process of coding. Several types of unrelated findings make up the process discovery theme, including the level of comfort and degree of confidence that teachers expressed regarding use of the product; factors that impede teachers’ willingness to participate in piloting new educational technology products; the lack of formalized avenues for teachers and students to provide feedback; and the necessity of making on-the-fly adjustments to the product being implemented. In general, the piloting or implementation of new technology products as a result of this project pushed teachers to try something new with relatively little preparation time, making teachers feel uncomfortable, especially when other factors such as student testing, teacher evaluation, and inconvenient class scheduling got in the way. However, some teachers saw this discomfort as an inevitable byproduct of pushing oneself to improve. “If you wait until you’re an expert, you’re too late... You don’t necessarily know what you’re doing the next day all the time, and that’s okay. You’re looking things up right before class; that’s okay. You’re doing the best thing for the kids if you are branching out... and doing something that, as long as it’s safe, even if you’re not a hundred percent comfortable with it...,” explained a teacher from the South Fayette School District.

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Table 22: Process discovery findings and quotes

Findings	Quotes
It takes some time for teachers to become comfortable and gain confidence with using the product; having training and time to preview products helps increase comfort and confidence	"I think most people see the ability of technology, but we do have some people who shy away because they just are not necessarily comfortable. So, you may have to be patient to show them... I may just pull up something and show them just how to plug in to make it project. I mean, simple things that you take for granted that they might need assistance with." — <i>Fulton Teacher</i>
Factors such as accountability, teacher evaluation, class scheduling, and testing may affect teachers' willingness to participate in the pilot process	"I think that's why it goes back to telling the teachers how it's going to support them... We do have some teachers, especially teachers that don't have their children all day, certain grade levels, they're departmentalized, so they have the kids for half the day... I think the teachers who are departmentalized and have their children for shorter periods of time, I think they show angst about these programs coming into their classroom or students having to be pulled out of the classroom." — <i>DCPS District Administrator</i>
Several districts lack formalized avenues for collecting feedback from teachers or students during the pilot process and recognize that getting better feedback would improve the process	"We don't have a formal way to give feedback. I think that students, because they're using the product, I think it's important... I would love for them to be engaged in the product that they're using, but whether or not students like it or love it is not the end-all, be-all in the decision-making." — <i>DCPS District Administrator</i>
Administrators and teachers run into obstacles and problems during the process and must make adjustments to improve ease of use and effectiveness	"That's one of our problems at the beginning. We were naïve to thinking, to say, 'We just push on and push and push,' but naturally, and they didn't. At that point, we realized we've got to have a minimum pace and relay that to the students. 'You have to work at a minimum pace.' That was a big challenge at first, but putting in deadlines for students... that really helped. Making those changes... and we were able to make changes, and the admin was okay with making changes. We made changes that we felt that we needed to." — <i>Piedmont Teacher</i>

Teacher-student dynamics. Teacher-student dynamics are an important influencing factor for the success of a new product in any classroom. Dynamics include interactions, relationships, and the classroom environment. The findings in this section present examples of shifting teacher student dynamics because of product implementation, as well as examples of teacher interaction with students in overcoming challenges. Teachers experienced uncomfortable shifts in their teaching styles because of the pilot product. Several teachers felt that the product changed how they interacted with students as well. Students noticed when teachers felt confident or uncomfortable with the product implementation. Students also made very interesting comments about how dynamics with teachers are different depending on the level of training that teachers received. The student voice was strong on this topic and yielded intriguing results.

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Table 23: Teacher-student dynamics findings and quotes

Findings	Quotes
Teachers have shifted their instruction styles to fit the program	"The only thing that was weird for me is they really were doing a lot of their own. It was kind of weird for me. We did a lot on computers for a couple weeks in a row. It was weird for me because I was used to more action, but the kids were so engaged. I was doing a lot less." — <i>South Fayette Teacher</i>
Teachers are available to students if they need help but try to have students solve problems themselves first; students often become facilitators alongside the teachers	"It took a little practice not to jump in right away, you know. I always want to help right away, and um, you know it really opened my eyes to the fact that, you know, there are many situations that... that is not the right approach. You need to let a kid struggle; you need to let a kid collaborate with a peer, um, and learn from their own failures just as we did growing up as kids." — <i>South Fayette Teacher</i>
Teachers sometimes become stressed out when they do not have enough training and have a difficult time helping students; students then feel as if they have to learn on their own	"For me, just because it's new technology... is just going back and learning the dashboard... what all the symbols mean and where they were having problems and how I could help them with that. ...in the beginning, in order to make it useful for my class, I'm going to have to learn. What if they're redoing something, what does that mean? ...That was a lot of learning for me just because that's how I figured that I would be helpful for my students is that so you could hit that." — <i>Vista Teacher</i>
Teachers building good relationships with students helps to increase student engagement; teachers can then encourage students to correctly utilize the program or work harder; kids work harder when they know that a bad evaluation will harm their teachers	"...We built us good relationships with our students. When they find out it does affect our paycheck, which I'd say it doesn't but on 33% of our evaluation, the kids go, 'Okay,' and they trust ²² ." — <i>West Ada Teacher</i>

Technology. Technology is a prominent aspect of the current research. It is included as a category because participants frequently commented on several aspects of the pilot process that related to technology. We heard about the importance of existing technological infrastructure for a new product, as well as the desired capacity for sustaining that technology over time. We also heard extensively about technological glitches that interfered with the pilot process. A teacher in South Fayette discussed his opinion that technology is important for learning but should not take over education completely. "One of my standards is being able to get students to use, manage, and access technology in all aspects. My view has changed; I'm still one of those, I guess, old-school guys who are, 'Don't digitize the whole world because we need people to actually put houses together; computers can't do that yet.' ...That type of thing, but it [technology] is important for learning."

22 West Ada teachers explained that improved student performance is integrated into their annual merit and performance evaluations.

SECTION IV—QUALITATIVE ANALYSIS RESULTS

Table 24: Technology findings and quotes

Findings	Quotes
Need to determine whether the district's hardware/software/tech infrastructures, i.e., bandwidth or operating systems are compatible with the product	"...one thing that I would consider is just the specs for the hardware because that's also something that you don't necessarily think about. There has been a challenge on some of the laptops because we have newer Macs and we have older Macs in there; the older ones, when they go to start, its just spinning and the menu doesn't come up. Just make sure that your hardware meets the specifications of the program." — <i>DCPS Assistant Principal of Literacy</i>
Need to consider the sustainability of finances to support the program, the capacity to sustain the technological infrastructure over time, and whether the company will continue to provide IT/ product support	"You need to look at that and say, again, sustainability. Even if I pilot it and love it, can I sustain it? If it really works and I love it, it is something that I can keep long term and utilize, or is it something that I only got a grant [for] and I can do it for two years, and after that I can't use it anymore. You shortchange the kids when you do that." — <i>Piedmont Principal</i>
Speed of program when accessed on different types of networks LTE/4G/ hardwired, etc., varies	"Oh, it upsets me because, whenever you're not on a Wi-Fi network and you're on LTE, it takes longer no matter what, whether you're either finishing one question or you're loading a new level or you're just starting. It takes double the time it would if you were on Wi-Fi." — <i>Vista Student</i>
Software glitches—screens freezing, students losing their work, etc.	"Sometimes it freezes. Not a lot, but sometimes, and you're right in the middle of something. You're in the middle of a pre-quiz or something and you're almost there, and when it freezes, you can't go back and start at the same problem. You have to start ... over again." — <i>Vista Student</i>
Inconvenient and extended downloads and updates interfere with instruction	"We want this on the kids' computer, and we don't want to have every kid to have to download. That's our biggest thing. We want it, but how do you make that process easier for us? If it's us touching five hundred computers, then that's not helping." — <i>South Fayette Teacher</i>

Additional Findings—Discussion and Recommendations for School Districts

Discussion. Throughout the research process, many findings emerged that do not fall neatly into the process, evaluation, or procurement categories because they apply to multiple stages of the process or, in some cases, are always present but exist in the background. Despite not neatly adhering to our original research structure, these findings remain important, as they were reoccurring across districts and strongly influence pilot success.

When asked what advice they would give to education technology developers, teachers and students were most concerned with program ease of use and that the program is intuitive and user-friendly. To improve ease of use, particularly at the start of implementation, teachers urge developers to provide more training prior to implementation to prevent troubleshooting issues later. Students were very opinionated about specific features of the programs they used as well as how the programs were used, and teachers and administrators were eager to hear their suggestions. In contrast, administrators were concerned about the relationship between district officials and vendors and wanted vendors to cater to district needs in terms of product design, such as aligning the program to district or state standards, and services provided, such as the provision of data and professional development. Because teachers and students are often not as involved in maintaining communication and relationships with vendors,

SECTION IV—QUALITATIVE ANALYSIS RESULTS

district officials should solicit teacher and student feedback and communicate any advice they collect from that process to education technology developers to ensure product improvement.

Several challenges in implementing pilots emerged from the data. One of the biggest challenges was the timeline for this particular project. Districts that piloted new products this spring were operating in direct contrast to their typical pilot process. Finances in terms of acquisition and sustainability were huge challenges as well. Professional development and IT support from both the vendor and from on-site staff created challenges if they were not available to teachers. Students interestingly commented that they could tell when teachers were struggling, and that affected their learning. This finding is also supported by the student survey data analysis presented later in the report. To properly understand whether a program has the potential to make an impact on student learning or other student outcomes, the program must be implemented properly, which means that the teacher must know how to use the program correctly.

The importance of communication and relationships is a critical new theme that emerged during the research process. It is well known that it is important to have the support of leadership and a main point of contact during a pilot. However, the findings suggest that even more important is how decisions and information are communicated during the process. It was revealed that interaction between levels of the bureaucratic structure (i.e., between administrators, vendors, teachers, and students) is crucial in facilitating a successful pilot. Collaboration in the pilot process varies depending on the level of centralized leadership in the district. Collaboration at all levels will create an environment for openness in which the goals of all stakeholders can be communicated and understood.

During the course of this project, districts worked very hard to develop their process for piloting, and several districts reported the development of pilot processes as a primary goal. They were thoughtful about how they did things and took note of their actions this spring to provide necessary documentation to Digital Promise. For example, Vista created a process flowchart (Appendix C), and Piedmont created a project timeline (Appendix D).

Districts are finding better ways of planning, brainstorming, and conducting research in advance, as well as communicating needs and goals to vendors. Districts are keenly interested in moving away from the “wild, wild West” of piloting (West Ada, Vista, and Fulton) that existed in the past and toward a more organized way of testing out new products. West Ada thoughtfully chose to focus this pilot on data analysis (Appendix E). The catalyst for this thoughtfulness was most likely the involvement of Digital Promise in the districts’ pilots; however, no matter the reason, it is a positive outcome to see districts streamlining and identifying their processes.

“Process discovery” refers to aspects of the pilot process for which districts did not plan ahead of time but emerged as key factors in the pilot process. This includes comments about the importance of communication and relationships, teachers’ and students’ comfort level with the pilot, ideas about a formalized feedback process, and a few other unexpected findings. Throughout the process, districts discovered that the users’ comfort level with the pilot product was very influential in their opinion and use of the product. Comfort was not a variable expected to play such a role. In some districts, South Fayette for example, the piloted product seemed to seamlessly fit into the existing curriculum, increasing teachers’ comfort and confidence in using the product. Teachers also expressed concern about participation when they were evaluated or pressed to meet high expectations. Process discovery insights reveal that, although these districts are outstanding in many things that they do, there are still opportunities for learning and improving the pilot process.

Positive dynamics between teachers and students are vital to a successful classroom. It stood out that, when teachers were ill prepared to utilize the program or lacked proper training, the students were affected. Students felt that they were left to learn things on their own when teachers could not help them but that it was beneficial to work through the challenges. However, student-teacher relationships were strengthened through the process of learning something new together and working to achieve district goals.

SECTION IV—QUALITATIVE ANALYSIS RESULTS

Because many districts recognized the importance of teacher-student relationships and students learning from each other, strong professional development should be inclusive not only of how to use the product but also how to integrate the product into instruction and engage students with the product to improve student outcomes.

Technology is a main theme throughout the study. The sustainability of technological infrastructure, as well as labor to administer frequent software updates, were concerns throughout the process. It is understandable that technology issues will arise during the pilot of new education technology programs, as participants are learning. However, administrators and teachers alike stated that districts need to consider the possibilities of technology glitches and ensure that the district has the proper hardware beforehand.

Recommendations for school districts.

- ◆ School districts should pass along feedback they receive from teachers and students to the developers to continuously improve the product.
- ◆ Addressing challenges voiced by students and teachers throughout the process will increase support and buy-in for the product.
- ◆ Pilot captains/coordinators should keep in mind the common challenges of piloting a new product and frequently check in with teachers/students/admin to prevent problems.
- ◆ Take careful note of things that did or did not work during a pilot and use this to fine-tune the process. Pay attention to developments throughout the process that are surprising or unexpected.
- ◆ Provide support for teachers in their grassroots efforts to pilot new programs whenever possible. Teachers are more likely to follow procedures when they are provided with support.
- ◆ Where applicable, encourage students to help each other and act as facilitators alongside teachers.
- ◆ Remind teachers to have patience when experiencing shifts in instruction style; the program is meant to improve teaching and learning, but it takes time to adjust.
- ◆ Prepare technological infrastructure (i.e., hardware) for the new software and ensure sustainability before implementation.
- ◆ Have IT support available for teachers at all times in case glitches occur.
- ◆ If the pilot program requires multiple software updates, be sure to have time/staff/money to commit to the updating process.

SECTION V—QUANTITATIVE ANALYSIS RESULTS

Along with focus groups, interviews, and district documentation of the pilot process, we also collected survey data from students, teachers, and administrators. The purpose of conducting surveys was twofold. First, the surveys provided direct feedback to the participating school districts about the specific pilots they conducted. Second, the survey data provided an opportunity for additional analysis of participant responses to pilots across districts. The student survey, with over 1,200 responses, was the only survey of the three with a large enough sample size to conduct powerful statistical analysis to serve the latter purpose of surveying; as such, the following quantitative analysis results are based on the student survey given to participating districts.

Student Perspectives of Program Effectiveness by Student Race

The first set of analysis consists of examining differences in student responses within districts by student race. Because of the plethora of different racial groups observed in the participating districts, student racial categories were aggregated into two groups—White and non-White.

Within a given district, non-White students were more likely to report that, because of program use, they participated more, engaged more in teamwork, improved verbal communication, were more confident, tried harder, were more engaged, and were more excited. Within a given district, students with higher grades were more likely to report that the program was easy to use and that they became better problem solvers as a result of the program. Students for whom English is not their home language were more likely to report that program use made them try harder to complete their work. Tables 25 and 26 present the results of the regression models generating these findings.

These findings highlight the fact that different types of students respond to the use of education technology in different ways and suggest that, when determining the needs and goals for the use of educational technology products, these differences should be accounted for. Additionally, the findings likely reflect the different outside-of-school and in-school experiences of different groups of students. For example, that higher performing students were more likely to report that the use of education technology enabled them to become better problem solvers may reflect the different uses of educational technology for different levels of students. In focus groups and interviews, educators frequently mentioned education technology as a tool for differentiation; therefore, it makes sense that higher-performing students could be using their education technology programs for higher-order skills such as problem solving, while those with lower grades are using programs more for understanding content, which is also what the findings suggest.

Findings show that minority students are more excited about using educational technology, are more motivated, and work harder when using education technology products; this could reflect differing levels of comfort with traditional systems of education. Poor children and traditionally disenfranchised groups are often not comfortable with traditional societal structures like school²³. The use of educational technology provides an alternative to traditional schooling, where teaching and learning often occurs in an undifferentiated group setting. Therefore, it makes sense that minority students might benefit more than White students from the use of educational technology, thereby changing the structure of how education is delivered.

Student Perspectives and Factors Relating to Program Usage

In this section, we examine the relationship between student perspectives of program effectiveness and factors influencing program usage—specifically teacher knowledge of the program, use of the program outside of school, and experiencing technical challenges when using the program.

Within a given district, students who reported having a teacher who had better knowledge of how to use the program reported more favorable outcomes as a result of the use of technology across all categories (program ease of use, participation, confidence, verbal communication, teamwork, effort, engagement, motivation, excitement, problem solving, and understanding of content). This finding highlights the importance of professional development to successful pilot implementation. In the qualitative analysis, the findings relating to professional development mostly involved the types of

23 Lareau, A. (2011). *Unequal childhoods: Class, race, and family life*. (2nd ed.). Berkeley, CA: University of California Press.

SECTION V—QUALITATIVE ANALYSIS RESULTS

professional development offered, who was receiving the professional development, and the logistics of providing professional development. Here we see that students who think their teacher is more skilled at using the program also reported having a better experience with the program across a range of outcomes. Providing professional development not only increases teacher confidence in using the program but also improves the experience and perceived outcomes for students.

Additionally, students who reported using the program outside of school responded more favorably across all categories. In contrast, students' reported ability to use the program outside school did not affect students' perceptions of program effectiveness. This indicates that the students who use the program outside of school are also those who think that the program is most beneficial and that students using the program for homework respond more favorably than those who do not use the program outside of school. This has important implications for district officials when deciding whether to provide program access. Access alone does not seem to make students respond more favorably to the program. However, access gives certain types of students who think that the program is most beneficial the ability to use the program outside of school. Therefore, districts need to weigh the benefits and costs of providing access outside of the school day and seek to understand which types of students will be most likely to use the program outside of school.

Within a given district, students who reported experiencing technical challenges were less likely to report that the program was easy to use and reported less agreement that use of the program increased confidence, problem solving, motivation, excitement, engagement, and understanding content. With respect to the qualitative findings, teachers and students often discussed the different types of technical challenges they experienced when using the program—glitches, Internet failures, etc.—and how they dealt with the challenges. However, the findings presented here indicate that those technical challenges result in real impacts on students' perceptions of product effectiveness. This finding indicates the importance of IT support, planning, and professional development or training with the program. Through support, planning, and training, the likelihood of experiencing technical challenges can be reduced, thereby improving students' learning experiences with the program.

Discussion of Quantitative Analysis

The findings from the quantitative analysis provide a strong supplement to the findings in the qualitative analysis, particularly regarding the importance of professional development. Student perception of teachers' knowledgeable use of the program was the strongest factor related to student perception of the effectiveness of the program, with education technology products perceived to be less effective by students when they are used in classes where teachers were not adequately trained.

On a broader level, the survey results indicate the importance of the student voice in determining product effectiveness. The students surveyed clearly had opinions about whether the products were helpful or not. The fact that statistically significant relationships were found and that the direction of relationships are as expected means that student perceptions of program effectiveness and the factors that affect program effectiveness are likely to be valid.

SECTION V—QUANTITATIVE ANALYSIS RESULTS

Table 25: Regression results of regressions examining the impact of student characteristics on perception of product effectiveness

	Easy to use	Participate more	More confident	Problem solver	Team-work	Improve verbal comm.	Try harder	More motivated	More excited	More engaged	Understand content better
South Fayette	0.00486 (0.0325)	0.373*** (0.0919)	0.210* (0.0971)	0.237* (0.0938)	0.490*** (0.0961)	0.0651 (0.0943)	-0.0105 (0.0989)	0.0693 (0.0904)	0.538*** (0.110)	0.458*** (0.102)	0.458*** (0.104)
Vista	0.110** (0.0382)	0.274* (0.108)	0.350** (0.114)	0.254* (0.110)	0.205 (0.113)	-0.00328 (0.111)	0.0778 (0.116)	0.135 (0.106)	0.823*** (0.130)	0.701*** (0.120)	0.559*** (0.122)
West Ada	0.0989* (0.0492)	0.175 (0.139)	0.0622 (0.147)	0.0915 (0.142)	-0.199 (0.146)	-0.253 (0.143)	-0.172 (0.150)	-0.0592 (0.137)	-0.293 (0.167)	0.135 (0.155)	0.226 (0.157)
White	-0.0167 (0.0270)	-0.158* (0.0763)	-0.144 (0.0806)	-0.127 (0.0779)	-0.170* (0.0798)	-0.181* (0.0783)	-0.173* (0.0821)	-0.102 (0.0750)	-0.249** (0.0917)	-0.266** (0.0849)	-0.0669 (0.0860)
English at home	0.0322 (0.0337)	-0.0387 (0.0954)	-0.185 (0.101)	-0.118 (0.0974)	-0.178 (0.0997)	-0.155 (0.0979)	-0.239* (0.103)	-0.128 (0.0938)	-0.0608 (0.115)	-0.0956 (0.106)	-0.142 (0.108)
Report card grade	-0.0131* (0.00536)	-0.0105 (0.0152)	-0.0327* (0.0160)	-0.0536*** (0.0155)	-0.0230 (0.0159)	-0.00873 (0.0156)	-0.0199 (0.0163)	-0.0277 (0.0149)	-0.0160 (0.0182)	-0.0166 (0.0169)	0.0177 (0.0171)
Constant	0.802*** (0.0452)	3.258*** (0.128)	3.431*** (0.135)	3.611*** (0.130)	3.528*** (0.134)	3.402*** (0.131)	3.966*** (0.138)	3.243*** (0.126)	2.996*** (0.154)	3.141*** (0.142)	3.075*** (0.144)
N	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256
R ²	0.014	0.020	0.031	0.026	0.051	0.017	0.025	0.014	0.088	0.066	0.034

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

Table 26: Regression results of regressions including student demographics and factors influencing student use

	Easy to use	Participate more	More confident	Problem solver	Team-work	Improve verbal comm.	Try harder	More motivated	More excited	More engaged	Understand content better
South Fayette	-0.00914 (0.0329)	0.282** (0.0920)	0.136 (0.0974)	0.121 (0.0928)	0.394*** (0.0968)	-0.0206 (0.0961)	-0.130 (0.0992)	-0.0165 (0.0905)	0.437*** (0.108)	0.375*** (0.101)	0.328** (0.102)
Vista	0.0422 (0.0418)	0.0210 (0.117)	0.0759 (0.124)	-0.0250 (0.118)	0.0114 (0.123)	-0.144 (0.122)	-0.141 (0.126)	-0.118 (0.115)	0.430** (0.137)	0.346** (0.128)	0.274* (0.130)
West Ada	0.0631 (0.0500)	-0.000141 (0.140)	-0.103 (0.148)	-0.107 (0.141)	-0.342* (0.147)	-0.363* (0.146)	-0.344* (0.151)	-0.227 (0.138)	-0.522** (0.164)	-0.0694 (0.153)	0.0329 (0.156)
White	-0.0170 (0.0265)	-0.169* (0.0741)	-0.154* (0.0784)	-0.146 (0.0747)	-0.186* (0.0780)	-0.201** (0.0774)	-0.195* (0.0799)	-0.116 (0.0729)	-0.260** (0.0869)	-0.269*** (0.0810)	-0.0860 (0.0825)
English at home	0.0407 (0.0330)	-0.00145 (0.0925)	-0.154 (0.0979)	-0.0727 (0.0932)	-0.140 (0.0973)	-0.133 (0.0965)	-0.198* (0.0997)	-0.0959 (0.0909)	-0.0121 (0.108)	-0.0547 (0.101)	-0.102 (0.103)
Report card grade	-0.0111* (0.00527)	-0.00216 (0.0147)	-0.0234 (0.0156)	-0.0442** (0.0149)	-0.0167 (0.0155)	-0.00309 (0.0154)	-0.0122 (0.0159)	-0.0190 (0.0145)	-0.00322 (0.0173)	-0.00498 (0.0161)	0.0289 (0.0164)
Outside sch. use	0.0961** (0.0295)	0.356*** (0.0826)	0.375*** (0.0874)	0.387*** (0.0832)	0.271** (0.0869)	0.181* (0.0862)	0.301*** (0.0890)	0.344*** (0.0812)	0.545*** (0.0968)	0.496*** (0.0903)	0.372*** (0.0919)
Technical challenges	-0.0691** (0.0219)	-0.116 (0.0614)	-0.181** (0.0650)	-0.122* (0.0619)	-0.0953 (0.0646)	-0.0352 (0.0641)	-0.0608 (0.0662)	-0.119* (0.0604)	-0.307*** (0.0720)	-0.278*** (0.0672)	-0.170* (0.0684)
Teacher prog. knowledge	0.0694*** (0.0117)	0.255*** (0.0329)	0.251*** (0.0348)	0.306*** (0.0331)	0.250*** (0.0346)	0.209*** (0.0343)	0.286*** (0.0354)	0.247*** (0.0323)	0.378*** (0.0385)	0.325*** (0.0359)	0.353*** (0.0366)
_cons	0.538*** (0.0645)	2.234*** (0.181)	2.448*** (0.191)	2.390*** (0.182)	2.539*** (0.190)	2.570*** (0.189)	2.814*** (0.195)	2.261*** (0.178)	1.534*** (0.212)	1.882*** (0.198)	1.698*** (0.201)
N	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251
R ²	0.060	0.085	0.093	0.112	0.100	0.051	0.086	0.078	0.191	0.161	0.121

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

SECTION VI—CONCLUSIONS

The analyses performed for this study suggest that districts do engage in a process for piloting, although there may not be a formal standardized pilot policy. When considering a district-supported product implementation, districts engage in extended planning before introducing (piloting) a product in classrooms. In some cases, products are piloted after they have been used in classrooms where “early-adopter” teachers have found success with the product. When this occurs, districts will pilot the product in other classrooms or schools to learn if the product demonstrates acceptable student improvement, engagement, and teacher buy-in. In other instances, products are piloted after a district has vetted the product with the vendor, peer districts, and/or a district-based committee. All districts are concerned with curricular alignment, data integration, and student improvement, although the definition of improvement varied across districts. In most districts, teachers and administrators were unable or unwilling to identify an expected degree or percentage of student improvement. The analysis also suggests that districts discover pedagogical shifts because of the inclusion of tech-learning tools, observe improved 21st-century learning skills among students²⁴, and recognize a need to establish a formal pilot process and a formal process for soliciting feedback from teachers and students about piloted products.

Three findings, we believe, are important bases for future study that are all associated with data: how districts collect and use data to make decisions, student perceptions about their learning and program ease of use, and feedback for developers. While most districts participating in the study had defined or consistent practices surrounding planning for and implementation of education technology products pilots, there were fewer standard practices in place surrounding the collection of data and feedback to be used in evaluating products, which directly affected how districts went about evaluating the success of the piloted product. As noted, districts collect data from multiple sources but repeatedly reported relying on standardized exam scores to determine whether the product is meeting students’ needs. However, our analysis indicates that districts often do not plan ahead to appropriately demonstrate the impact of a product on student test scores.

The student survey results demonstrate significant differences between White and non-White student perceptions about whether the product is easy to use and helps to improve their learning. This is an important finding that suggests that, when districts identify education technology products that they believe will meet the learning needs of students, they also pay attention to more than standardized test scores when making their selections. Furthermore, students indicate that, when they experience technical problems with products or have a teacher who is less knowledgeable in using a product, they also feel that the product is less effective. This highlights the need to plan ahead to minimize technical glitches and increase teacher comfort using products.

The study also demonstrated through both focus groups and the survey data that students can provide thoughtful, critical, and constructive feedback about education technology products that can be useful to both school officials when implementing products or deciding whether to purchase a product and to education technology developers trying to improve product ease of use and effectiveness. While we find student feedback quite insightful, in most districts, there was no formal process for collecting student feedback during the piloting of education technology products.

Data Limitations and Study Considerations

The analysis presented in this report combines data from varied sources, and as such, not all processes followed a standardized analytical approach. For example, as noted in the previous sections, not all districts participated in the Digital Promise survey, nor were student focus groups facilitated in every district. A site visit to Fulton could not be arranged. Other participating districts devoted more time to site visits, allowing more extensive data to be collected through interview and focus groups. Although there was an executed MOA on file with each district, three of the larger districts in the study required additional data and confidentiality agreements. The impact of executing the additional agreements delayed data collection processes for two of the three districts. DCPS was the only district that

24 Throughout the study, teachers reported many instances of student improvement in 21st-century learning skills (e.g., problem-solving, critical thinking, and teamwork), but this finding is omitted from the qualitative findings section because it was not a unique finding related to our research goals.

SECTION VI—CONCLUSIONS

required an additional MOA for data sharing and approval of the research project. Scheduling a site visit with DCPS proved difficult. Despite piloting Newsela PRO at nine school sites, a site visit could only be arranged at a single school for a one-hour period.

Working with fairly large economically and ethnically diverse districts in a short time frame was a formidable challenge for collecting data throughout the project. Fulton County teachers did not participate in the teacher survey, and students from Fulton and DCPS did not complete the student survey.

In addition to survey limitations, there are several other limitations of the data to consider. First, the participating districts were selected using convenience sampling. The six participating districts were chosen from a select group of districts, members of the League of Innovative Schools, that are committed to technology integration, are considered innovative forerunners in K-12 public education, and as a result, had existing relationships with Digital Promise, enabling Digital Promise to solicit their participation in the project. Because the participating districts are already committed to advancing the use of technology learning products in their districts, the recommendations presented in this report should be framed with the assumption that districts planning to pilot a program are committed to integrating education technology tools into the academic culture.

As noted, these six districts participated because of their experience with and interest in using education technology tools in classrooms. Being members of a peer community also provides them with an additional source of information for engaging in pilots. Our recommendations are useful to all districts, but because the studied districts emphasize a culture of innovation and technology integration, they are ahead of the curve when it comes to technology capacity. They also have staff and students who are accustomed to using technology as tools for teaching and learning; therefore, additional challenges that were not observed in the participating school districts are likely to arise for school districts that are piloting education technology products for the first time.

An additional consideration is the recognition that school districts knew that they were participating in a study of pilot processes and that data would be collected about their processes. The researchers' emphasis on the pilot process likely influenced districts' heightened attention to their pilot process during the project. Within the research context, this is known as the Hawthorne effect, where those being observed modify their behavior in response to observation²⁵. Therefore, the observed pilot process may not be the typical pilot process for these school districts. Furthermore, the districts received grants of \$35,000 for participating in the Pilot-to-Purchase study, enabling them to use funds on the pilot that they may not have been willing or able to use in the absence of the grant. While the observed pilot processes were potentially atypical of districts, the observation of well thought-out, intentional pilot processes likely benefitted our research because we saw best-case scenarios, highlighting aspects of pilots that the districts do well that can be used to inform other districts of potential best practices.

Future Research

The dichotomous perspectives of educators and education technology developers represents a future research opportunity that involves collaboration on developing a mutually accepted standard for student assessment that a) provides a robust reflection of student performance, learning needs, and growth; b) validates product efficacy; and c) can be easily aligned with Common Core standards.

Our conversations with districts about data and observations of how districts were using data to evaluate piloted products were insightful; districts collect an enormous amount of data to measure student performance. Our study shed light on the variety of sources from which districts can select to determine product efficacy. For example, both the Vista Unified and Fulton County Public School Districts surveyed parents, teachers, and school-based administrators about products throughout the pilot. In some cases, survey data are used to inform stakeholders about the product or curriculum

25 McCarney, R., Warner, J., Iliffe, S., van Haselen, R., Griffen, M., & Fisher, P. (2007). The Hawthorne effect: A randomized, controlled trial. *BMC Medical Research Methodology*, 7(30), 1-8.

SECTION VI—CONCLUSIONS

shift. In other cases, the surveys tell districts about perceived student needs. Data are also collected from teachers via informal conversations during PD and through email exchanges. These less formal sources are check-ins for administrators to learn about teacher and student perspectives. While administrators stated that they take these conversations into consideration as part of the education technology product evaluation, they also stated that these conversations are not formally compiled or weighted as heavily as student outcomes. For the most part, student feedback is conveyed to administrators via teachers. Unless the program clearly does not satisfy teacher and student needs—student and teachers do not like or the program, it does not align at all with classroom content, or it is technologically unsustainable—much of the data that districts collect are not used to make a decision about whether to continue use of a pilot product.

Districts also source data from the programs piloted. Usage rates (the frequency and/or amount of time students and teacher use a program) and progress rates (the advances that students make while using the program and identification of gaps in student content knowledge) are available and reviewed by districts for both entire classes and individual students. Despite developers' insistence on the reliability of internal assessments, many school district personnel do not consider internal program metrics reliable measures of student improvement.²⁶ A future research project for education technology pilots could involve working with districts to identify which combination of data collected is the best option to determine product efficacy for improving student learning, not just improving test scores.

Understandably, the national attention on assessment keeps districts focused on standardized test score improvement as the primary indicator of success. As schools grapple with how best to prepare students to thrive in a global, tech-informed society, at the K-12 level, there has not been a shift in the standard used to determine student preparedness beyond test scores. In contrast, higher education institutions have already begun relaxing reliance on and the requirement of standardized test scores from tests such as the SAT and ACT as the key metric for college admission²⁷.

While this study provides information about the importance of budgeting calendars for pilots and general purchasing timelines, there are fewer insights into how and what data are used to inform pilot purchasing decisions. Our ability to learn about the procurement process, specific to decisions made about education technology pilots, was limited by the project timeline. A future research project could contribute to what has been presented in this report by further investigation of the “to-purchase” segment of pilots.

Developers often collect data from students about their products during beta trials. They are also gather user analytics once the product is in schools. However, the current study demonstrated that students can provide thoughtful, critical, and constructive feedback about market-ready products. Student feedback is offered within the context of improving their learning, which could be very useful information for integration into product updates.

Epilogue

Many of the districts were unable to make accurate evaluations of the pilot products during the spring because of the short timeline. Districts' reliance on state standardized measures for student improvement meant that the receipt and analysis of student data would likely occur after the June 30 project deadline because districts frequently do not receive test results until later in the summer. In addition, standardized test data that would demonstrate a change in performance for students over a brief period are unlikely because existing research indicates that the learning of new technology resources requires a significant investment of time and energy^{28,29} that is more likely to occur with a

26 Morrison, J., Ross, Corcoran, R., & Reid, J. (2014). *Fostering market efficiency in K-12 ed-tech procurement*. Digital Promise.

27 Salganik, L. H. (1985). Why testing reforms are so popular and how they are changing education. *The Phi Delta Kappan*, 9, 607.

28 Liu, M., Navarrete, C., & Wivagg, J. (2014). Potentials for mobile technology for K-12 education: An investigation of iPod Touch use for English language learners in the United States. *Educational Technology & Society*, 17(2), 115-126.

29 Hew, K. & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Education Technology, Research, and Development*, 55, 223-252.

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longer implementation period. In some cases, performance may actually regress before improvements are demonstrated during initial program implementation. Therefore, several of the districts have plans to extend the pilot to make a more informed purchasing decision. Below are the next steps for each district.

DCPS. DCPS has extended their licenses for Newsela PRO through the summer and into the 2015-16 school year. Pilot implementation will continue through the fall, followed by a thorough evaluation of the product to inform a long-term purchasing decision.

Fulton. Because Fulton did not pilot a new product, they do not have to make a purchasing decision. Teachers in Fulton have full access to BrainPOP and IXL for as long as they want it. Fulton hopes to continue to improve their pilot evaluation processes and create effective data evaluation techniques. They plan to look at their list of “pre-approved” apps (programs that are already paid for and available to teachers) and determine whether they are all properly utilized and effective to avoid wasting any money. There is interest in developing an online marketplace with products to which teachers have access.

Piedmont. Piedmont felt confident that Achieve 3000 was effective and planned to make a purchase by August 1. The Achieve 3000 reports on Lexile scores were pulled mid-June to evaluate the pilot. Through a conversation with the district administrator at the end of July, he felt assured that the purchase would occur before the beginning of the upcoming school year.

South Fayette. South Fayette, with help from their university partners, will extend the use of Vex IQ robotics into next year. Because of South Fayette’s unique purchase of robotics equipment, they do not have to make a further purchase. There is no need to pay for licenses; they already have the equipment for as long as it can be maintained. Their strict purchasing policies made it difficult for them to acquire the robotics before the help of the Pilot-to-Purchase Project grant. South Fayette will work with CMU to make desired adjustments to the Vex IQ lessons to better fit with curriculum. After adjustments are made, South Fayette plans to continue the use of robotics in the STEAM classrooms to foster an environment of computational thinking. Additionally, South Fayette plans to work with Pitt LRDC to create pre- and post-tests with better language for students to understand.

Vista. Vista has worked with ST Math to extend use of ST Math through the 2015-16 school year. They hope to obtain more definitive quantitative data about the program’s effectiveness by the spring of 2016 to understand the true impact on student achievement in math. The school sites involved in the 2015-16 will modify their schedules to better accommodate the use of ST Math in the classrooms.

West Ada. West Ada plans to continue to evaluate ALEKS to determine best practices for the evaluation of products. The curriculum department will promote the use of “mastery” measures internal to the digital content to link programs to standardized test performance indicators. Through this analysis method, WASD hopes to identify effective tools and best-practice use.

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Appendix A—Fulton Sage Fox Report

Appendix B—South Fayette Expectations from CMU

Appendix C—Vista Flowchart

Appendix D—Piedmont Timeline

Appendix E—West Ada Process Diagram

Appendix F—Pilot Planning Checklist

Appendix G—Digital Promise Student Survey Questions

Appendix H—Digital Promise Teacher Survey Questions

Appendix I—District Budget Timelines

Appendix J—Ideal Pilot Timeline

Appendix K—Logic Model

APPENDIX A—FULTON SAGE FOX REPORT

Fulton County Schools Pilot-to-Purchase Evaluation

An independent study of the processes by which
Fulton County teachers discover and acquire
new digital resources

June 30, 2015

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APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

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APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Executive Summary

The purpose of this study is to contribute to the following evaluation aims set forth by Digital Promise and Fulton County: (1) Determine the most efficient and effective process by which schools can adopt digital resources. (2) Develop a process/rubric that teachers and others can use to make sound adoption decisions. (3) Contribute findings to the design of an interactive marketplace for digital resources.

Digital Promise will combine the data reported in this study with those of other participating school districts to gain a better understanding of pilot-to-purchasing processes.

SageFox Consulting Group was hired to conduct focus groups at eight elementary schools, two from each of Fulton County's four Learning Communities (Figure 1), to examine the processes by which teachers discover and acquire new digital learning resources. Schools were chosen based upon reported use of two math digital resources, BrainPOP® and/or IXL®. Curriculum Support Teachers (CSTs) within each school were asked to identify focus group participants, those teachers who frequently locate and implement new digital resources within their schools.

In total, fifty-five elementary teachers contributed to the following findings:

- To acquire new digital resources, Fulton employs both formal and informal processes for piloting and trying-out, respectively.
- Administrators, media specialists, and teachers have the authority to purchase new digital resources.
- Fulton County is financially stratified. In general, the Northeast and Northwest Learning Communities have more available funding and parental support than the South and Central Learning Communities.
- Teachers spend personal time searching the Internet and consulting colleagues for new and helpful digital resources.
- In particular, teachers seek digital resources that quickly engage students, have built-in assessments, and address learning standards.
- School budgets, earmarked reserves for media specialists, classroom monies, and parent support are common sources of funding for new digital resources.
- Teachers cite several barriers to efficient classroom use of digital resources: teachers hesitant to incorporate technology; not enough hardware (desktop computers, laptops, and tablets); complicated program login credentials and the time it takes to help students log in; lack of a computer lab teacher; and unreliable student home access to the Internet and computers
- If Fulton County would like to implement an online marketplace for new digital resources, teachers would like to read other teachers' comments/feedback about a product (including a star rating system) and see video demonstrations. The website should be easily searched with the capacity to filter by subject - grade level - standard, type of resource, and if the resource is free or requires payment.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

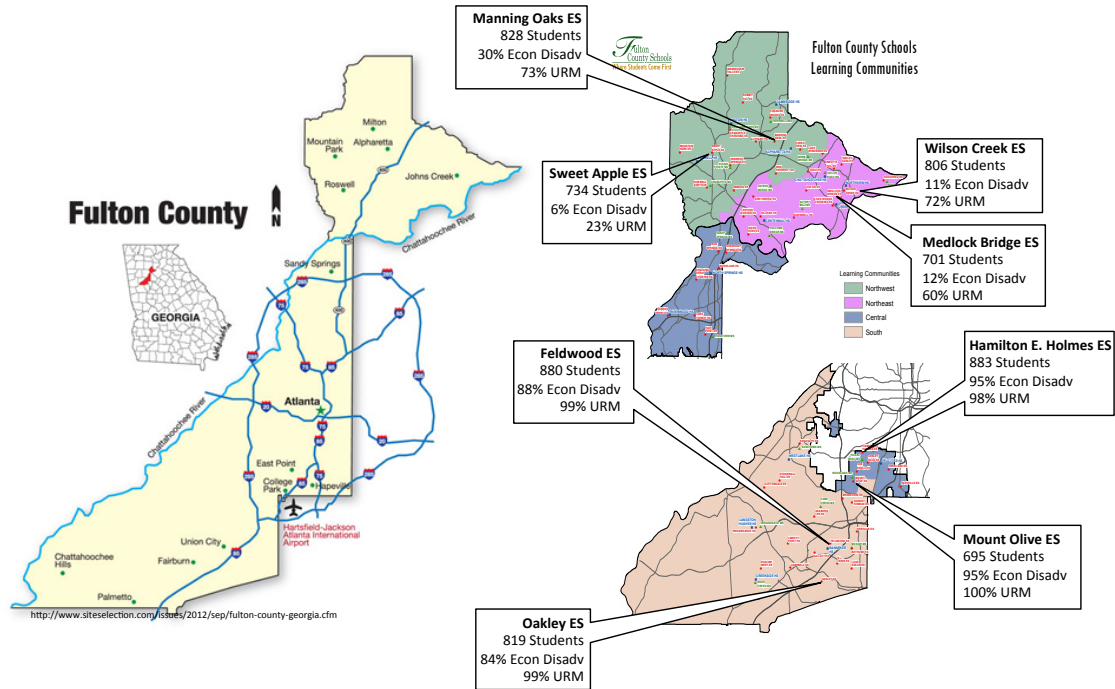


Figure 1: Eight Participating Elementary Schools within Fulton County's Four Learning Communities
 Economically Disadvantaged (Econ Disadv)= % students who qualify for free or reduced lunch
 Underrepresented Minority (URM) = % non-white students
 Data provided by Fulton County Board of Education upon request

Evaluation Methods

School Selection

Fulton County is stratified in that the Central and South Learning Communities serve higher percentages of economically disadvantaged students than the Northeast and Northwest Learning Communities (Figure 1). To understand these different perspectives, Fulton County and SageFox Consulting Group agreed to narrow the focus of the study to two elementary schools within each of Fulton County's four Learning Communities (eight schools total) that currently use BrainPOP® and/or IXL®.

Teacher Selection

Fulton County provided the contact information of Curriculum Support Teachers (CSTs) within each of the eight participating schools. These CSTs provided contact information of teachers within their schools who actively seek and implement new digital resources. These teachers were contacted via email and asked to participate in a one-hour, after-school focus group conducted between May 4 and May 14, 2015.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Focus Groups

Seventy elementary school teachers were contacted for participation in the Pilot-to-Purchase study. Of those solicited, fifty-five teachers agreed to take part in one of eight focus groups¹. Focus groups took place on-site after school for an average of one hour, and Fulton County compensated teachers for their time. The focus groups were recorded and transcribed.

Teacher Demographic Data

During each focus group, teachers were asked to anonymously provide demographic data regarding their career, age, ethnicity, and education (Table 1).

Table 1: Participating Teacher Demographic Data

	Learning Community			
	Northeast	Northwest	Central	South
Average % of career at current school²	55%	58%	62%	38%
Age	% Participating Teachers			
20-30	40%	7%	34%	24%
31-40	50%	23%	40%	28%
41-50	10%	15%	13%	42%
51-60	-	55%	13%	6%
Ethnicity				
Black or African American	10%	7%	87%	88%
White	90%	84%	13%	12%
Other	-	7%	-	-
Highest Degree Completed				
Bachelor's	50%	53%	20%	35%
Master's	50%	38%	53%	35%
Specialist	-	7%	27%	24%
EdD / PhD	-	-	-	6%

Of note, focus group participants from the Northeast and Northwest Learning Communities were predominantly white while those from the Central and South Learning Communities were mostly Black or African American. Teachers in the Central and South learning communities held Specialist and EdD/PhD degrees, unlike participants from the Northeast and Northwest Learning Communities. To add, although 42% of the participants from the South Learning Community are between 41 and 50 years of age, they reported spending only 38% of their education career at their current schools, well below averages of the other three Learning Communities, suggesting a higher degree of teacher-turnover in this region.

Study Limitations

This study is constrained by the perspectives of focus group participants. SageFox did not collect data from administrators, parents, or students, who all might have different opinions than those reported here. To add, focus groups are not designed to measure the extent to which themes exist across a population.

¹ Response rate = 79%

² Measured as number of years at current school/total number of years as an educator

APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Data Analysis

All interview transcripts were coded and analyzed for common and divergent themes in an iterative manner; as themes emerged, the analyst developed descriptions and selected anonymized quotes for illustration.³

Findings

The findings below originate from data reported by teachers in the eight focus groups. For ease of use, this information has been categorized into the three study aims.

AIM 1: Determine the most efficient and effective process by which schools can adopt digital resources.

Pilot-to-Purchase Processes

While BrainPOP® and IXL® were used to qualify schools for participation in the study, Fulton County has used these programs for a considerable amount of time. Most of the participants could not recall when these resources were unavailable. In fact, most teachers use BrainPOP® or IXL® daily. Because of this ongoing use, interview questions were generalized to also include both small- and large-scale pilots of all new digital resources.

Collectively, information derived from all four learning communities gave rise to a timeline to describe the general processes teachers use to discover a new digital resource that might ultimately lead to the purchase of a school license (Appendix 1). The data below further depicts this informal process from discovering to purchasing new digital resources.

Discovery

Websites

Using their own time, often at night, all teachers reported frequently consulting websites for new digital resources to incorporate into their classrooms. Most of these websites cater to teachers and are searchable by grade-level and/or activity.

Teachers reported consulting the following websites for information regarding new digital resources:

- Active School Apps
- Edmodo
- Instagram
- Kahoot!
- Pinterest
- Reading A to Z
- Symbaloo
- Teachers' Blogs (Kindergarten Smiles, Mrs. Jump's Class)
- Teachers Pay Teachers
- TenMarks

³ Miles, M. (1994). *Qualitative data analysis; an expanded sourcebook* (2nd Ed.). Oaks: Sage Publications.

APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Word of Mouth

Teachers from all eight focus groups identified their Media Specialist as a valuable source of information on new digital resources. Media Specialists are responsible for finding these resources and training teachers to use new technologies:

Our Media Specialist...She'll provide trainings for us on how to use things like the Promethean board, Kindle Fires, iPads, how to use them small-group/whole-group, independently with the students, as well as different either apps or websites, web resources. Sometimes she'll just shoot us an email saying, "Hey, here's a great activity or a great program."

Sometimes [our Media Specialist] will call our classes to the media center, and she'll conduct lessons using one of those [resources] and kind of gives us hands-on experience with it as well as the students.

Sometimes [our Media Specialist] will send out emails like, "Great new app," or, "Great new resource."

Participants also reported relying on more "tech savvy" teachers to mentor and inform them of new digital resources:

If I find one I like, I kind of stick to it...it's hard for me to kind of venture off unless somebody else introduces it because they've used it.

I kind of think that everyone has at least one tech savvy person on their team. So, they're the ones that come and find all the interesting or innovative websites.

I have a friend that that's all she does. So, if it's something that's a good site for students, she'll shoot it to me. Then I'll play with it at home to see if it's something that I definitely can use in the classroom.

[If] I find something that's really cool and I know it will help the teacher next door to me I will let them know. Or if I need something, I might go and ask, "Hey, I'm trying to do this. Do you know of anything I could use?"

Teachers also reported participating in more formal discussions around digital resources facilitated by their school, specifically during grade-level or faculty meetings:

Someone might do one thing and may say, "Okay. There are some cool activities here," and stuff like that. So, we'll share during grade-level discussions.

We always do it [share new digital resources] for our grade-level meetings.

It's often brought to us from our leaders. Oftentimes, we'll have a faculty meeting and they will introduce something new. They may actually bring in an on-site trainer to give



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

us a mini professional development on it. But it's kind of their initiative and, "This is great for our population," and we kind of go from there.

If funding allows, Media Specialists and other teacher leaders attend technology conferences and are responsible for disseminating information and training colleagues on new digital resources:

Then the people that go to the technology conferences at our school, they come back and they redeliver to the whole staff.

I know [the Media Specialist] attends conferences. I know the GaETC is a big one for her.

One teacher reported that the school CST provides information on new digital resources:

Our CST gives us resources. Also, different things if we're needing help in general to help with our reading and math scores for the kids to try.

One teacher reported that parents and students provide information of new digital resources:

Sometimes I get it from parents or kids. They're like, "They've been doing this 'whatever' at home."

Lastly, one teacher from the Central Learning Community reported occasionally discovering new digital resources from countywide emails, suggesting that mass-emails from the Central Office might not be the best way to disseminate such information:

Every once in a while, I'll find a jewel in the Fulton emails. They'll send so many emails about different websites. Every once in awhile, I'll just try it out and it might work.

Key Findings: Common Paths to Discovering New Digital Resources

- Websites
- Informal discussions with "tech savvy" teachers
- Formalized grade-level and faculty meetings
- Educational Technology conferences
- Media Specialists
- CSTs
- Parents and students
- Countywide emails

APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Desired Characteristics of New Digital Resources

As teachers peruse the Internet or speak with colleagues about new digital resources, they are looking for technologies that possess specific characteristics.

Promotes Engagement

Primarily, Fulton County teachers seek new digital resources that will engage their students. When asked to define “engagement,” one teacher expressed this common sentiment and also outlined how he conducts small-scale pilots of new digital resources:

[Students are engaged when] all students are actively involved, very much staying on-task and not requiring any redirection. Then based on your assessment thereafter, they acquire the knowledge that you expect them to acquire...I introduce a newer technology for a week. Then like the third day, I’m kind of assessing to see if it’s effective or ineffective.

Teachers expressed that digital resources should be user-friendly. Specifically, the login process should be easy to complete, and students should then be able to work independently without constant supervision:

I look at how easy it will be to implement in the classroom, if it’s easy for the students to login. There was one I was looking into where the students, like every child would have their own blog...but it was so involved that we just never did it.

Being able to access it, like if it has a really hard login. If something has an easy login, that’s always an easy start for me.

I think my first thing is user-friendly, like can the kids do it? Because some things are great resources, but with all of our kids, we can’t give it to them and have them do it. Like user-friendly is huge.

If they catch on easily, then we’ll keep implementing it in the classroom.

One other thing I look for is how independent can they be. I don’t want them jumping up every five minutes and coming asking me questions. Can they sit there? Can they understand what they’re doing? Can they work independently and complete that assignment? So, that’s very critical for me.

But if it’s something where I have to keep going when they’re at the computers to help them, then I’m probably not going to keep using it.

In addition to user-friendliness, teachers expressed that new digital resources should be fun to promote student engagement:

[Students] move quick now. I want it to be fun for them and when they don’t know that they’re learning.

It’s got to be something that will grab their attention.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

You don't want them, "Oh, God, I have to do this again."

Otherwise, if my kids don't want to do it, then that's just a waste of time.

Some teachers assign online homework through digital resource platforms and expressed that students should be engaged with the content, even at home:

It's also something that's fun and engaging, something that they'll want to use, and something that they can also use at home.

I know with us too, if we send it home as part of the homework, it lets us know who's actually working on it at home, who's actually using it.

Differentiated Instruction

In addition to promoting engagement, Fulton County educators look for digital resources that provide differentiated instruction:

I like to use something that I can individualize with the kids, differentiate with the kids if I can assign them specifically.

Even in centers, for each group that we have, if we're playing a game, we might put one group on level one, one group on level two.

And one thing that I like about the IXL is if you have a kid that needs the standard, but they need it on a first-grade standard, and some may need it on a second-grade standard, sometimes you may even extend that and do the third, fourth, and fifth.

In doing so, teachers can better reach all students without isolating those who are below or above grade level. As one teacher described, students know if their work is different from that of their peers:

I think it's a great thing, because a lot of times they'll want to be on a game. They're like, "Ooh!" But when it's something different, they zoom in more to what they're doing, because they realize, "My neighbor is not doing the same thing. We're doing different activities."

Some teachers specifically employ digital resources to help remediate students:

Because I'm a special education teacher, I look for just the different levels, the differentiated instruction. For example, I teach fourth grade, but we still use BrainPOP Jr. because it reaches some of my lower kids. We'll just use regular BrainPOP for the other kids that are on grade level. So, I look for just the different varieties of how they ask the question and the different activities that they have to do, and how it relates to those kids that I teach.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Well, not all of the kids in my class are on fourth grade level math. So, IXL or i-Ready kind of puts them where they're supposed to be, but it doesn't say, "Well, you're actually doing second-grade math," or, "You're doing third-grade math."

The kids that are a little behind, you're doing a skill that's not necessarily like your grade level, but that kid needs that foundation.

One teacher used differentiated instruction to help explain personalized learning to parents:

So, it helps, especially when you want to sit down and talk to a parent and say, "Okay. This is where your child is, and these are some of the things we're doing to target exactly what this child is performing," not necessarily on grade level, like standard activities.

Built-in Assessments

Fulton County educators also seek new digital resources with built-in assessments. These end-of-unit activities save time and allow teachers to tailor instructional strategies based on student performance.

Specifically, teachers are able to save time when they do not have to create/write and grade assessments that come with digital resources:

It needs to have an assessment to make your life easier.

It's not as time-consuming if you already have a built-in assessment that you won't have to create.

It's quick...just something where you can instantly get the feedback like, "Are they getting this?" Then too, it's just getting a grade. Sometimes it's hard to get a grade on things.

It's been a huge help for me, because they know I'm going to get on here. But, "My teacher's really going to put this in the grade book, so it matters," whereas before, they just wanted to play...it's just really helping you. But I love the assessment pieces or anything that I can put a grade to. I love that about it.

In addition to saving time, built-in assessments provide a real-time gauge of student learning. Teachers use this information to adapt lesson plans accordingly:

I think teachers are constantly assessing and we're looking for informal and formal ways...For us, it's a way to build the next day so that when we reflect on where they were or what they missed, that tells us and leads us to the next day. "Well, I'm going to hit this, because clearly they didn't get that," or, "Oh, I don't have to teach this, because they all got that. So, I can move on, or extend the lesson, or remediate," or whatever it is that you need to do.

You can see that five of the kids got this wrong, or seven of them. You can see as an educator, do I need to work on this some more or do I need to say, "Okay, they all have it." So, the assessment part is key.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

We often look at the data and compare, and look at what they need to make improvements, or some things they can go back and work on.

Then I go back and look and see what areas they might need more help in. So, it's just good on the fly data, too, to instruct your groups.

Then when the kids take it, it gives me a guide on how long it took them to complete it, if they did video hits to help them. So, I can see, "You did it in five minutes and you got 100%. It took you thirty minutes, and you watched a lot of hits, and you still didn't do well." So, that really helps me to know who I need to spend more time with and who already has it and can just go ahead and move onto the next thing.

Lastly, built-in assessments provide feedback directly to the students, reinforcing important concepts while promoting engagement and individualized learning:

I also like too, if there's other stuff besides just a video. Like if there's all kinds of things. Like, "Okay, what do I do after the video?" You know, like where there are connections if there's like an activity, or a quiz, or just connecting it.

BrainPOP has...quizzes that you can take whole-group, or the kids can take individually. So, that's always a plus because there's something attached to that and not just watching a video, but to see that they understood exactly what it was trying to convey to them.

It gives the explanation so they won't have to raise their hand, "I don't get it." If they get it right, they can move on. If they get it wrong, they can stick to the computer on how and why and go to the next question. So, I like that.

Standards-Based

Although it was not mentioned at every school, several Fulton County educators identified the need for standards-based learning tools:

But I think that it being standards-based is a higher priority of what I'm looking for.

When I'm looking for a program for them, I'm looking to make sure it's connected to the standard, standards-based.

I look for how does it address the standard and what I'm teaching. How in-depth does it go?

Something that aligns with what we're teaching... The standards.

Several teachers commented that a standards-based digital resource is more easily justified to school administration:

It's easier to justify to our admin if it's connected to a standard... They'll say, "Why are the kids playing this game?" "Well, it's standard 2.3."



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

I know we have to fill out a form, I mean, what we're going to use if for and why we're going to use it, the standards it's going to address, whether we want to purchase new technology or even if we want to purchase subscriptions. You have to turn that form in and submit, and get it approved.

If it's not free...we'd have to...take it to [administration] and explain how we would connect to the standards, what benefit would this be.

Key Findings: Desired Characteristics of New Digital Resources

- Promotes engagement through an easy login process, independent use, and fun, game-like activities that can also be completed at home
- Differentiated instruction to simultaneously serve students who are performing below, at, and above grade level
- Built-in assessments that save time and provide data to help teachers tailor upcoming lesson plans
- Standards-based tools can be easily justified for adoption and purchase

Acquisition

Once they have identified a new digital resource they would like to bring into their classrooms, teachers use a variety of means for acquisition. Because of the financial stratification in Fulton County, some teachers have an easier time acquiring new digital resources than others.

For example, one teacher in the Northwest learning community said:

Pretty much if there's something we want, we ask for it. If it's a reasonable thing that we're going to use, somebody funds it somehow.

In contrast, a teacher in the South Learning Community spoke about spending personal money on new digital resources:

If it's something that you see as a benefit for your students, then you just bite the bullet.

Recognizing these different vantage points is critical to understanding the processes by which teachers acquire new digital resources. In Fulton County, as in other districts, local school funding is directly proportional to property taxes. Furthermore, Learning Communities located within more economically developed areas benefit from more parental and community financial support than those in areas in need of rehabilitation.

It is important to note that the avenues outlined below are not available to each school in the County, and common funding sources are not necessarily equal.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

School Budgets

Teachers from all eight focus groups identified the annual school budget as a potential source of funding for new digital resources. Teachers have direct communication with school principals and assistant principals, both formally and informally, to request funding for new digital resources.

At a Title I School in the South Learning Community, teachers must submit school budget requests up to one year in advance:

A lot of times [the administration] start planning now [in May] for what they're going to purchase next year. It's not just, "Let me go and buy something today." So, you kind of have to start having those kinds of conversations with them prior so they can spend their money. They tend to write a proposal for what they'll use their monies for prior to the school year starting.

In the Northwest Learning Community, one teacher explained the relatively flexible school budget:

We used to have a form we had to submit, but we haven't had to use that in awhile. But it used to be like the name of the app, the price, and what the purpose was... The turnaround is pretty quick...two to five days.

Regardless of the time it takes to acquire the new digital resource using the school budget, teachers reported that principals and assistant principals often require justifications for their requests.

According to some teachers, Fulton County has a list of pre-approved digital resources. If an app or program is on this list, the administration is more likely to allocate funding:

Then you go to the school budget. You've got to go to the principal. If it's in the budget, then I guess it would be approved if it's a pre-approved app.

However, teachers from the Central Learning Community were unaware of the pre-approved list and even suggested that Fulton County incorporate such a system:

I feel like there should be a list of pre-approved apps...Just because like we said, if we find something like, "Oh, this could be cool," we'll run it by [our Media Specialist] and then they've got to see if it's approved. If it's appropriate. If Fulton County's already got that list, they can search it.

If teachers would like to purchase an app or program that is not on the Fulton pre-approved list, they must provide student performance data to support the purchase:

They're paying for it, so of course you have to come with some solid proof showing, "Okay, before my kids started, this is where they were. This is just the magnificent jump or gain that they've made." You definitely kind of have to sell it to get them to buy into it.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Because at the end of the day it's, "Okay, what's our cost-to-benefit ratio here if I'm about to spend this money on it?"

Teachers expressed that administration was more likely to support the purchase of a new digital resource that could be implemented across multiple grade levels:

The bigger bang for your buck, the more apt to say, "Sure," if [all teachers] could use it. If it's very specialized, they may say, "Let's see," or, "Wait."

To add, teachers reported that fidelity of implementation is key in helping administrators make budgetary decisions. New digital resources are easily rationalized if teachers are willing to regularly use them:

I think sometimes what they look for from us is just the commitment...Some teachers used it with fidelity, and some teachers didn't. But they were spending thousands of dollars on the program...I think that plays a factor in whether or not they're purchasing these programs.

Media Specialist Funds

Within a few schools, the Media Specialist receives earmarked funding for new digital resources. In these instances he/she has the autonomy to make purchasing decisions:

She [the Media Specialist] has a lump sum of money that she's allowed to purchase from.

Our Media Specialist is great about making it [a new digital resource] available to the school when she can.

SageFox interviewed one Media Specialist to gain a better understanding of her purchasing rationalization when allocating these funds:

I would look at how it's used. Is it going to be just substituting for a worksheet or is it going to go up in that upper range of getting high order thinking skills? So, to me, that's very important, because there's a lot of gratuitous use of technology. I really want it to be more authentic. So, I will go and see how it will be used and what the applications can be in the classroom, and if it will really benefit the students, and also ease of use. It has to be easy for the students. It has to be easy for the teacher. So, I'll look at those things. Whatever skill they're working on, I want to be able to see if that student had growth in that skill. So, from when they started using the resource to when they're done, I want to see improvement. So, there has to be a way to measure that. Show me when you started you were at two out of ten correct. When you are done, you're at eight out of ten correct. So, this is something that is really showing me the students are actually learning.

Annual Classroom Supply Funds

Traditionally used for construction paper and other classroom supplies, a few teachers reported using annual classroom funds to purchase new digital resources, but the amount of money allocated to each class varied depending on the school:



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Well, it was \$150. Then it went \$100. Then it was \$150.

What did we get? \$400 this year... Per class. And we have to use it by the beginning of March.

It was \$1,000...It was a grade-level pool

Last year, I used Spelling City for vocabulary. It wasn't free, but it was like \$30 for the whole year or something. So, I used my teacher money to sign up for that.

Parent Organizations

At schools with strong parental involvement and financial support, teachers described using PTA/PTO/Foundation/Donation funds for the purchase of new digital resources:

It's like you fill out a grant form. Then at their next meeting, they'll vote. They don't really ever say no.

So, PTA picked up the tab on the BrainPOP. Then the following year so many teachers used it that PTA just picked it up and they've picked it up ever since.

I've taken parent iTunes gift cards, and I've purchased apps that way.

We have reimbursements from PTA. They reimburse money that we can show that we have bought things. They'll reimburse us our own personal money.

The PTO gives you \$100 at the beginning of the year.

Personal Funds

As mentioned, some teachers “bite the bullet” and pay for digital resources using personal money. This expenditure usually occurs if there is no room in the school budget or if teachers do not want to use the formal process that might take up to one year:

I spend a lot of my own money on things, which is great at the end of the day, because I can take it home with me if I go somewhere. But again, I don't feel like I should be spending my own money.

I've done that a lot with different things. I've tried different things out. If I like it, I'll pay for it myself.

I feel like I fight for what I have. I'm investing my own money.

Education Grants

Teachers differed on the degree to which Fulton County schools employ grant writers to help fund new digital resources. One teacher from the South Learning Community believed that the Northeast and Northwest Learning Communities frequently use grant writers and receive subsequent funding:



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

The other thing is that a lot of the schools systems in the North end, they have people that write grants... So, those grants actually kind of fund all of the technology hardware that's in those buildings. So, I know there's been a whole lot of grant work that's been done as well on the North end from a lot of the schools there.

His counterpart in the Northeast Learning Community was not as confident in her ability to write grants and expressed the time required does not yield a high return on investment:

I know that [our Media Specialist] she used to [write grants]. She and I actually were going to work last year to do it. I had never written one before. Then I found out what's all involved in writing a grant, and holy-moly, it's a lot of work. So, I think there are so many teachers around with such great ideas and great resources. But again, it's the time of when are we going to do it. "Oh, never mind. I'll just use what I've got. I'll just keep using BrainPOP and IXL," which is great, but it's time and knowing somebody who really has an expertise in writing grants.

To promote equal access to grant-based funding, Fulton County should consider writing grants to support programs that will benefit all four Learning Communities. In doing so, these County-level efforts would have a greater reach than multiple schools writing separate grants. To add, teachers would not be burdened with the meticulous work that accompanies grant writing.

Crowdsourcing

One teacher creatively used Donors Choose, a national crowdsourcing campaign, to seek funding for new digital resources:

We do like a Donors Choose... Where teachers can apply for somewhat of a grant and donors can place money on it to pay for it for you. I...I did the application and wrote up a little snippet about my classroom and that they needed the resources. Some donors paid. It was almost \$600.

Pirating

Several teachers from multiple schools reported pirating new digital resources to avoid paying fees and to sidestep the red tape involved when requesting funding:

I do a lot of collaboration with different people. Like a lot of my friends happen to be educators. So, oftentimes we may swap passwords. They may tell me something that we're not even using in the county that I could use. So, that also helps.

We did that with [a digital resource] for a while. Every teacher would create a free trial. Then we would just share between us.

The first year we were here as a school, we didn't have it [a digital resource]. We were using someone else's login.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Unknown

Finally, it is important to report that one teacher from the Central Learning Community did not know of a process by which she could request funds for new digital resources:

I heard of teachers at the beginning of the year pushing for that [new digital resource]. We got it towards the end of the year. So, I don't know what the process was... Well, they paid for it at first together. Then the next thing you know, we all had accounts.

Key Findings: Sources of Funding for New Digital Resources

- School budgets - may require one week to one year advanced notice
 - Administrators look for increased student performance, ability to use across grade levels, and fidelity of implementation
- Media Specialists receive earmarked funds that can be used to purchase new digital resources
- Annual classroom allocations can range from \$100 - \$1,000
- Parent organizations/donations
- Teacher self-pay
- Crowdsourcing
- Illegal pirating
- One teacher did not know the process by which she could request funds for new digital resources

Barriers to Success

Technological Gap

When asked about obstacles to perpetuating use of a new digital resource, many teachers commented on the technological gap that exists between those who are quick to adopt and those who are not. While these, often older, teachers bring a wealth of experience to the classroom, their students do not get the same level of exposure to technology as those in more tech savvy classrooms:

Reluctance to change. They don't know about it. They don't feel comfortable with it. They don't want to take the time to learn it. It's a different way of teaching. It's a lot of change.

Because we have some teachers, like [another focus group participant] said, it's different generations. It's hard. I can imagine...they're afraid to use it, or they don't know how because no one's really showed them, or they don't pick it up as quickly. So, they get really kind of shy and frustrated.

They don't want to say anything, because technically it's kind of younger versus older...they don't really say or speak up a lot, because they don't want someone to, in a sense, judge them because of their lack of use for computers. So, then they don't say anything and feel kind of sometimes on an island because they don't know as much as another person does.



APPENDIX A—FULTON SAGE FOX REPORT (continued)

I think most people see the ability of technology, but we do have some people who shy away because they just are not necessarily comfortable. So, you may have to be patient to show them...I may just pull up something and show them just how to plug in to make it project. I mean, simple things that you take for granted that they might need assistance with.

We spend hours and hours, and literally four hours in one week on the same thing... On the exact same website after handling the situation earlier.

I'm the go-to when something goes wrong first. So, I'll hear [my name]. I'll run down the hall and try to troubleshoot first. Then if I can't figure out something, then I say, "You have to talk to the technology specialist," because it just seems like nothing works right on that particular person's laptop, ever.

Limited Hardware

Even tech savvy teachers encounter obstacles when implementing new digital resources in their classrooms. A commonly cited barrier to success was the lack of hardware including tablets, desktops, and laptops.

It's hard for us, because some teachers have one iPad. We have iPads for the school, but sometimes you have to kind of take them out per class. Like we've only had two computers that have worked all year. So, sometimes using the technology is a little bit hard.

Six computers. While that seems like a lot, I have thirty-four kids in my room.

I feel like even some of the technology that we would have, like our computers or when I have some laptops checked out, they're just outdated... I can't count on them working. So, I'll play with something and three aren't working...then I have to pick kids because I've planned it, and now I can't rely on it.

Teachers from the Central Learning Community expressed specific concern about the availability of hardware and technology at their schools compared to others in the County:

I think in this Learning Community, we're at an extreme deficit compared to other Learning Communities.

And it could be just a County initiative, since they're stressing 21st Century Classrooms, that it's not on the individual school's budget. But it is something that the County is pushing through. Every school is equitable whether you're north, south, east or west.

It should be synonymous. You shouldn't go to a workshop and be caught off-guard with someone that's teaching ten minutes from you and have technology or access to something that you've never heard of before... So, countywide, even if I decided I wouldn't use it, I should still be able to have access to it.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Some of these teachers further explained how limited hardware negatively impacts lessons:

You're planning a lesson around that, but you don't know whether or not you're going to be able to use that technology. It makes you not want to even go through it.

And it's hard to get started on something and complete it like if the duration is like a week. That's almost impossible with three computers and twenty-five kids. Even if we get the eight iPads, we'll have to put them in rotations, which are fifteen and twenty-minute rotations. It's hard to grasp something or even complete an activity in that amount of time. You're really just logging in. By the time they log in, it's time to rotate.

Complicated Logins

Across all eight focus groups, teachers identified the student login process to be unnecessarily cumbersome. Most teachers reported students using their nine-digit lunch number and birthday as a username and password, respectively, to gain access to digital resources. Although these credentials remain constant throughout their tenure in Fulton County, students struggle with the basics:

That's where we're saying the ease of access too for the students to log onto the computer, it's their lunch number, which is like nine digits long. Then their password is their birth date, which you think would be easy. But they have to know that May is 0-5. They have to type it in. I have third-graders that still struggle with that. So, I can only imagine what it looks like for kindergarten.

I know another thing we have a problem with, with the little kids is it takes us all day just to log in them, because they don't understand username and password in the beginning. Some of them pick it up as the year goes on, but you're logging in twenty kids' usernames and passwords, and waiting for it to come up.

It's the typing... They're not able to look at the small type and notice what they got wrong. They just see the big picture. Oh, it mostly looks right. So, they couldn't see the one letter that they got wrong.

In addition to using the standard Fulton County login, some programs allow students to create their own usernames and passwords. This freedom of choice creates an additional barrier to effective implementation of a digital resource:

I've got twenty-four kids in my classroom, but on my Edmodo, I've got thirty-two because they keep forgetting what their password is.

For me, what frustrates me is just remembering all the usernames and passwords. It would just be nice to just go into a portal or platform and just click on something and it comes up.

I spend more time trying to log everybody on. So, by the time everybody got on, we only had just a few minutes to just do the activity.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Lack of Dedicated Computer Lab Teacher

Teachers from seven of the eight participating schools expressed the desire for a dedicated computer lab teacher. In the current model, teachers rotate class time in the school's computer lab. Teachers are responsible for using that time to teach the basics of maneuvering a mouse and typing, in addition to using available digital resources for lessons. Their frustrations and pleas for support are highlighted by the quotes below:

My hugest frustration with technology... my kids can't type anything in to log in or a specific ID for themselves...having a technology teacher who would teach them how to click the mouse and how to type on the keyboard would be really helpful for them, especially because they're just learning their letters anyway. But at least to give some sort of experience that would help them to use technology when we are using it in the classroom.

But again, wouldn't you guys all agree, how much time would that save if we actually had a teacher that was teaching them? Maybe their lessons one and two at the beginning of the year was how to log in, and then really going into typing.

I think that could be something so much more that we could be doing with our kids is actually having a technology computer teacher that does lesson plans, that does typing, that does how to use the computer. Because if technology is such this big thing that they all need to know how to do, most of my kids don't know how to type.

The one reason why I think we need to have a teacher, not so much even a Para-Pro, or if it's a Para-Pro that has that technology background, is that they can do research for us in advance and present it to us at grade level and say, "These would be great activities for your standards." That would kind of help us, because we don't have a whole lot of time to sit down and look up all those things. So, we tend to go back to what we know. I find myself always going back to what I know.

Another thing that would be good is like a specials class in the computer lab where the computer lab teacher is teaching those skills and the apps so when they go back to class, they know how to type...So, they may get an introduction in a computer class. Then [the teacher] won't have to spend as much time trying to introduce it and get it to work. They'll get that foundation in the computer technology class, and then come back to the classroom ready to start. So, that eliminates a lot of wasted time.

Only one participating school, located in the Northwest Learning Community, funds a computer lab teacher. This person is responsible for collaborating with classroom teachers to outline goals and lessons for students that provide basic computer skills:

We have a plan of the beginning, to the middle, to the end what our goals are... We want the kids to know how to use the mouse. So, she teaches them how to go in, and that takes a long time. So, some of the very first lessons are just logging into the computer and then computer parts, using a mouse, clicking a mouse...that's an important skill that they need to know. They're going to be required to take tests on computers and they're used to an iPad.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

This particular school also successfully recruits parent volunteers to serve in the computer lab. This extra support is especially valuable to students in kindergarten and first grade:

We have parent volunteers, too, that come in on our computer lab days.... They come in, especially with the lower grades. I know K and 1 definitely have parent volunteers, because it does take them so long. If there's a project that we want to get done, they'll come in and help log the kids in... We have a room parent who sends out a sign-up sheet for the entire year and says, "These are computer lab dates." It's usually one to two parents per computer lab session that come in.

Home Access to the Internet and Computers

Teachers from schools that support a high percentage of underrepresented minority students (Figure 1) cited home access to the Internet and computers as a barrier to successful implementation of digital resources.

For mine, to break it down honestly, a lot of mine are Hispanic students and do not have Internet. The thing is, I like to use that for my homework because it's just easy. It's engaging for them. It's not just having to do a worksheet. So, a lot of them will have to come in early in the morning and do it.

Our social worker actually has like these great resources for parents that can't afford it... But I think sometimes the families maybe are too prideful to ask. Not too prideful, but maybe just too embarrassed to ask.

The kids that come to our school are not the most high economic-wise. We have a very low economic status here. So, that probably puts into effect why some kids don't have computers or Internet.

See, now, even with the kids not having computers in the home, most of the parents have Smartphones. So, they use their parent's Smartphones for IXL. They'll tell me, "I couldn't use my mom's phone," or, "My mom wasn't at home," or something like that.

You'll know if you give an assignment. We had to do a research project. The kids came back and said, "My momma said I've got to do it here, because we don't have a computer at home." So, I'm like, "Okay. Well, now I know I can't send these types of things home because it's not fair to the ones who don't have anything."

Key Findings: Barriers to Successful Implementation of New Digital Resources

- Older teachers are especially hesitant to learn and adopt new technologies
- Schools do not have enough hardware to support student learning
- Teachers spend considerable time helping students navigate complicated logins
- Seven of the eight schools do not have a dedicated computer lab teacher to help students learn the computer basics of typing and using a mouse.
- Student home access to the Internet and computers limits the application of new digital resources.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

AIM 2: Develop a process/rubric that teachers and others can use to make sound adoption decisions.

Data from the eight focus groups were combined to produce a Pilot-to-Purchase Rubric that can be used by teachers, Media Specialists, CSTs, and school- and County-level administrators as they make decisions to adopt digital resources (Appendix 2). This rubric describes the roles of each stakeholder during all phases of the pilot-to-purchase process.

Phase 1: Discover

Overall, discovery of new digital resources primarily happens at the classroom level. Principals and Assistant Principals rely on teachers, Media Specialists, and CSTs to search the Internet and consult colleagues to ascertain new digital resources.

Phase 2: Purchase

Once a teacher has identified a new digital resource to incorporate into their classroom, he/she will pursue different routes of funding depending on the cost. If a program is free, can be purchased with teacher-controlled funds, or offers a free trial period, the teacher has the authority to begin using it immediately. If the desired digital resource requires more funding than the teacher has immediate access to, he/she must request school-level funding. Depending on the school budget, this request occurs within one week to one-year prior to the desired start date. Most administrators want to be sure the program addresses state learning standards, and some require student performance data to justify the purchase. The latter is especially true if a teacher has conducted a classroom-level pilot (“try out”).⁴

Phase 3: Implement

Teachers specifically look for new digital resources that promote student engagement, have easy logins, allow students to work independently at multiple levels, and are game-like in nature. Teachers appreciate resources that have built-in assessments and those which can be accessed by students at home. The built-in assessments save teachers time from writing and grading exams and are used to develop appropriate lesson plans.

Phase 4: Perpetuate

Teachers participate in both informal and formal technology professional development activities. Usually, tech savvy educators mentor those who are less inclined to adopt new digital resources. Sharing occurs from classroom to classroom, and at grade-level or faculty meetings. Media Specialists also play a key role in perpetuating use by offering information and training on available digital resources. If funding allows, teachers attend technology conferences offered by the County or other organizations. Usually, attendees are responsible for disseminating learned information to other teachers at their school.

Ideal Pilot-to-Purchase Process

In a best-case scenario, teachers would have the authority to purchase software below a school-defined threshold amount. Any digital resource that requires more funding should require administrator approval through purchase justifications such as demonstrated increases in student engagement, time on task, and performance and the agreement to be implemented by multiple teachers across grade levels. Trial data from classroom pilots or large-scale pilots from

⁴ Based on information from administrator phone interview with Digital Promise on June 17, 2015.

APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

other similar schools could be used to support purchasing decisions. Such data could be incorporated into Fulton County’s online marketplace for digital resources (see Aim 3). Students should have direct access (1:1 or at most 1:2 device: student) to current, reliable hardware. Computer lab teachers should be available to support classroom teachers and help students learn computer basics. Lastly, to promote proper, legal acquisition of new digital resources, administrators should clearly communicate these informal and formal processes to all teachers.

AIM 3: Contribute findings to the design of an interactive marketplace for digital resources.

General Concerns

Teachers from the Northwest Learning Community felt that Fulton County should not waste resources creating a new marketplace for digital resources. Instead, these teachers expressed a need for more professional development:

I would love to see the County focus on something else because I feel like there are so many things like that. Maybe it’s just because we’re at a school where we have access to a lot of technology and a lot of ideas. There are so many other avenues for them to focus rather than the technology marketplace.

We have Safari Montage now, which has a ton of stuff on it that’s already free. They have all the databases with MackinVIA, which has been a wonderful addition. You can get your library books and other things on that. So, why do we have to buy stuff?

You can only implement and use so much from August to May. It takes time, especially for the lower grades, to teach something. It’s not necessary to have a multitude of apps and different technology pieces when you’re going to find ones that work for your aged children, and you’re going to find some that work for your teaching style. What I may do in my classroom, that may be something that just doesn’t work. It’s not that you’re opposed to it or don’t know how to do it. It just doesn’t blend with your teaching style. So, I think to make this [online marketplace], I just don’t know if it would be used.

[We need] professional development... Face-to-face [about] differentiation and rigor. Those are the words that just get thrown out there and everybody interprets them differently, even within different schools. We’re all like, “Yeah, we’ve got differentiation. Oh, wait. What? You think that? I think this.” So, just clear consistency among the county would be nice.

Several teachers reported that Fulton County has a history of rolling out new websites that are not user-friendly. Some voiced their initial concerns that although this online marketplace is a noble endeavor, the final product must be user-friendly to support teachers rather than add to their list of items to learn.

I think that sounds like a good idea, but just from my few years being in the County, a lot of the things that I see Fulton bring forward to us, they’re not always user-friendly. So, while we’re talking about this, I think everybody might have a picture in their head of what they think the website could look like. But realistically, is it going to be that user-friendly? I have no idea.



APPENDIX A—FULTON SAGE FOX REPORT (continued)

If we have a website that looks like Amazon or looks like a shopping website, you already know how to use it. I don't have to sit through an hour and a half introduction presentation to this website to use. If it's user-friendly, just use it.

Suggestions for Online Marketplace

Search with Relevant Filters

All teachers expressed that the new online marketplace should be easily searched. Specifically, teachers recommended that programs and resources should be searchable following the path of subject - grade level - standard:

By subject. By grade. Where I could just type in. Maybe I pick a grade. I pick either a standard or I type in fractions or something, and it just brings up anything that's specific. Because you know how sometimes you'll search it and it looks great, but then once you go through it, you're like, "Oh, that's only for like second grade."

I came from another district several years ago. That's how they had it set up for us. Once we logged into the portal, they had it broken down. It was so user-friendly. But if I wanted to go to reading/language arts K1, I just clicked on Reading/Language Arts K1. Then you could just type in whatever you're looking for, the standards or whatever. Then you had resources. They gave you books that you could use, online websites, just every single thing that you needed. It was just right there at your fingertips, which made life easy for us, because everything was just in a centralized location. We didn't have to spend hours just Googling or on Teachers Pay Teachers and all of that type of stuff. Everything was just right there at our fingertips.

If I teach fifth grade, at that point I'm going to be looking for fifth-grade stuff. So, I don't want to be searching all around. How about if I just say, "1-2-3-4-5 – 5, boom!" Five comes up. What standard do you want to do? "I want to do that standard – boom!" Coming down where are the resources for that standard. "There, I've got it!"

That's where I think on the website you are able to manipulate it by either grade level, subject, or even if you could put your standards. LearnZillion is a tool that was shared with me. I can go on there and type in the exact standard that we're working on. The lesson comes up. The video comes up.

Secondly, teachers would also like the website to be searched by desired activity. In this way, teachers can specifically look for an app or an assessment:

That's the cool thing with Symbaloo. You can organize it. There are tabs. So, it's a platform. So, you can have videos. You can have apps. You can have games. You can have assessment. It's just little icons. It kind of looks like our Fulton County page with the little squares with icons, but each icon is like relative to whatever that Symbaloo page is.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Finally, products on the marketplace should be categorized as either free or paid:

Also, too, I was thinking could it be searchable by free and then by paid. List all the ones that you could just get for free, and then all the ones that you have to pay for.

Or like Teachers Pay Teachers, we can hit a free button and it will only pull up free things.

There's one website I often go to if I want to just pull up a quick worksheet or two. All of the worksheets are optional. But next to the ones that are free, they actually have "Free."

Video Demonstrations

Most teachers would like to watch a product video or a recording of a demonstration. This information could be used to help make implementation and purchasing decisions and would also provide teachers with a sample lesson plan to incorporate in their classrooms:

I like to be able to go to the video. I'm a visual learner. So, I want you to show me. I don't want to hear about it. I want to see it. Then I will decide for myself...I want to actually see it working. Then I'll decide if I want to take it on.

I think that would help, not only for us to be able to use it, but sometimes you can just introduce it to the students that way. Some of them are able to just kind of adapt to it quickly and easily themselves without us having to spend the weeklong trying to tell you something.

Show me how it's working and how you're using it. Then I can implement it and put my own tweak on it for my classroom.

Teacher Comments

Also of importance, teachers would like to read feedback from their colleagues. This system could mimic the feedback provided on most consumer websites:

I would say teacher feedback would be huge.

At the end of the day, I think you want that to come from educators and people in your craft, as opposed to someone who just created it.

I would like to see teacher's feedback. Maybe they could express ideas that I didn't think of and new ways to use the technology piece. Like you said, the review with other teachers. Maybe one teacher would say, "I like it," or whatever in this way or that way... Because once another teacher says it, you probably didn't perceive it that way. Maybe you would generate an idea just from someone else's experience, or you could bypass and make some mistakes or errors just by reading someone else's what they did.



APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Rating System

To supplement the text reviews, teachers would also like to view product star ratings, as reported by other teachers:

When I buy things online, I look at the star ratings. So, that tells me if this is really useful or not. So, I wouldn't mind seeing the star rating on different programs or apps, because even on Teacher Pay Teachers, the thing that has the most stars, those are generally the most useful and best activities.

Student Performance Data

In an ideal situation, teachers would like to see student performance data from others who have successfully implemented a new digital resource. This information could also serve administrators when making piloting and/or purchasing decisions:

I would like to see not just the stars. I would like to see what has been generated with that technology. What have you done with that? What have your children produced? What has it opened up their understanding for? What assessments or what kind of data have you gotten from that technology? That's what I'd like to see...Yes, the hard facts. Not so much the tutorials. I'm not a tutorial person. So, I want to see the hard facts and I want to see what you've done. If it agrees with me, if it makes me passionate about it, I'm going to jump onboard.

Embedded within Fulton Connect

Finally, many teachers suggested incorporating the online marketplace within the pre-existing Fulton Connect portal. This integration would promote a streamlined process and would allow teachers to access the marketplace from an already known medium:

If they could make it through a portal that we already have so it's not like another thing that we have to log into. If it could be just on that home just like a little button.

I would rather see that kind of stuff imbedded within Fulton Connect, personally.

Key Findings: Suggestions for an Online Marketplace for Digital Resources

- Must be user-friendly
- Search filters should include: subject-grade level- standard; type of activity; free or paid
- Provide brief video demonstrations
- Should include teachers' comments and product star ratings
- Ideally would report achieved student outcomes

APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

Evaluation Summary

Fifty-five teachers representing eight elementary schools, two from each of Fulton County's four Learning Communities, participated in focus groups to discuss the processes by which educators pilot and purchase new digital resources. Participants also reported on means of discovering and barriers to implementing new digital resources.

Discovery

All focus group participants reported browsing the Internet for new digital resources. Some of the most commonly mentioned websites include: Active School Apps, Pinterest, Edmodo, Teachers Pay Teachers, Teachers' blogs, Reading A to Z, Instagram, Symbaloo, and Kahoot! On a day-to-day basis, teachers often share resource ideas with each other. Usually more tech savvy teachers help instruct and inform those who are more hesitant to adopt new technologies. To add, most schools have formalized discussions during grade-level and faculty meetings to discuss new digital resources. All participating schools have a Media Specialist who researches and shares new digital resources. He or she, along with other teacher leaders, also attends educational technology conferences to learn of available resources. Lastly, some teachers reported discovering new digital resources from their CSTs, parents and students, and through countywide emails.

Desired Characteristics

Primarily, Fulton County teachers seek new digital resources that will promote student engagement. Specifically the program must have an easy login, allow students to work independently, and entice students with games and activities that can also be completed at home. Resources that allow differentiated instruction are in high demand, as are those with built-in assessments. Lastly, teachers also look for standards-based resources that can be easily justified to their administration.

Acquisition

Fulton County educators reported several routes for funding new digital resources. Primarily, teachers seek money from the annual school budget, which might require up to one year advanced planning. Some school Media Specialists receive earmarked funds to purchase new digital resources they feel would benefit their students. Additionally, most class teachers receive an annual supply stipend, ranging from \$100 - \$1,000, to spend as they see fit. In well-supported schools, teachers reported using parent monies to purchase new digital resources, either through PTA/PTO funding and reimbursement or through iTunes gift card donations. Some teachers even reported spending their personal money to purchase resources for their classrooms. More creatively, one teacher used a national crowdsourcing campaign to fund a new digital resource. Some educators, unfortunately, resort to pirating digital resources by borrowing a colleague's login information.

Barriers to Success

Discussing implementation of new digital resources, teachers cited several common barriers to successfully employing technology within their classrooms. Participants described a technological generation gap that prevents older teachers from easily using digital resources and requires younger, more tech savvy teachers to mentor their colleagues. Of equal importance, many teachers reported that their schools simply do not have the hardware to support consistent integration of new digital resources. This shortage is compounded by difficult



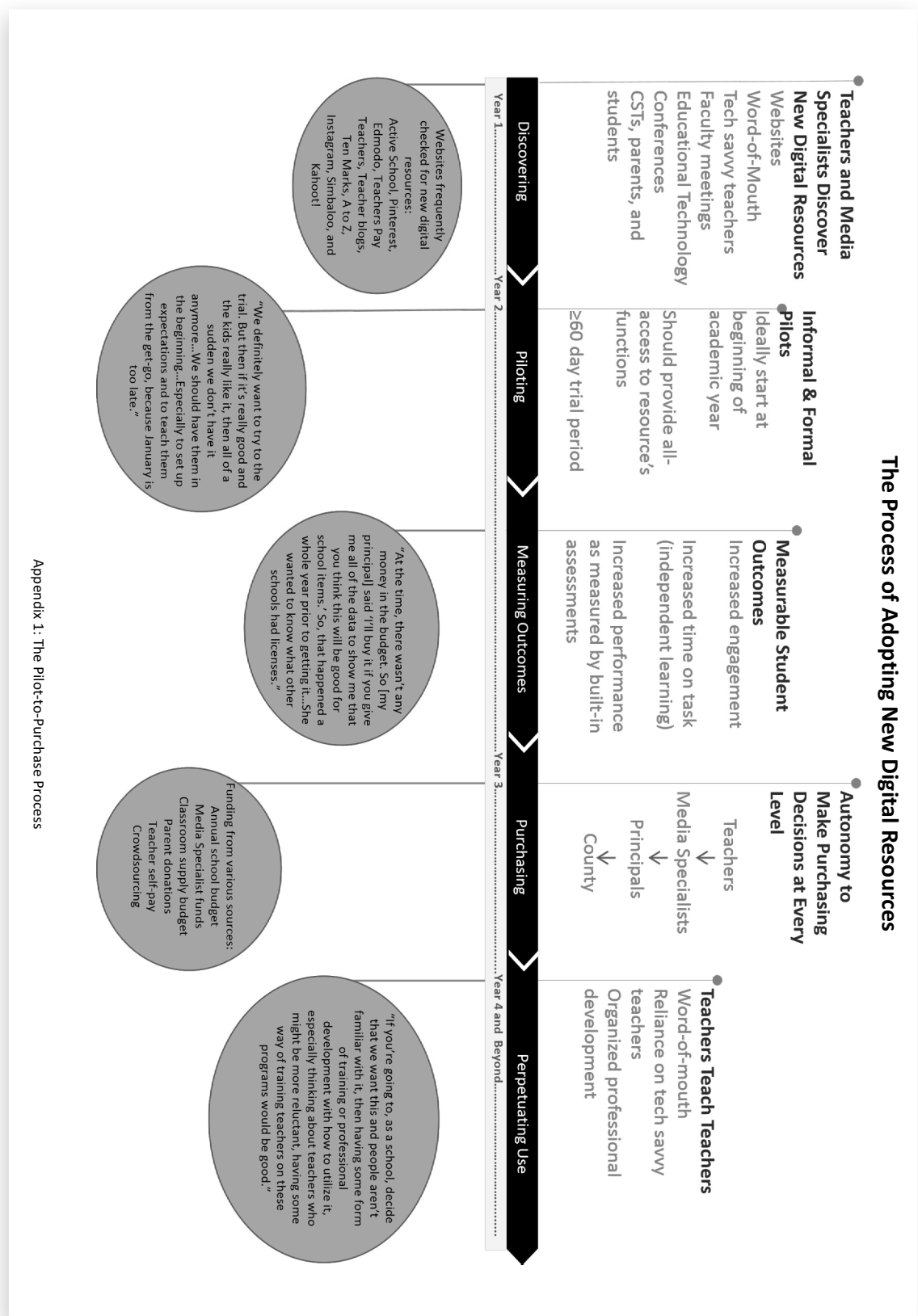
APPENDIX A—FULTON SAGE FOX REPORT *(continued)*

login procedures and the lack of a computer lab teacher. Participants from seven of the eight schools expressed the need for a dedicated computer instructor to help students learn the mechanics of operating a computer, including typing and maneuvering a mouse, which would cut down on the amount of classroom time wasted helping students log in. Lastly, teachers who primarily serve underrepresented minority students found that lack of home access to the Internet and computers limited their capacity to implement new digital resources.

Suggestions for Fulton County's Online Marketplace for Digital Resources

In addition to better understanding the processes by which teachers discover and acquire new digital resources, Fulton County requested information for an online marketplace for such technologies. When asked for suggestions, teachers expressed doubt that the County could effectively roll out a user-friendly portal that would not create more work for them. Teachers explained the website must be user-friendly and highly searchable. Specifically, teachers would like digital resources organized by subject – grade level – standard. They would also like to search for specific activities and know if resources are free or require payment. To help make purchasing decisions, the website should integrate video demonstrations and incorporate written feedback and star ratings from teachers who have used the resource. In a best-case scenario, the marketplace should also provide student performance data for digital resources.





Appendix 1: The Pilot-to-Purchase Process

APPENDIX A—FULTON SAGE FOX REPORT (continued)

Pilot-to-Purchase Rubric

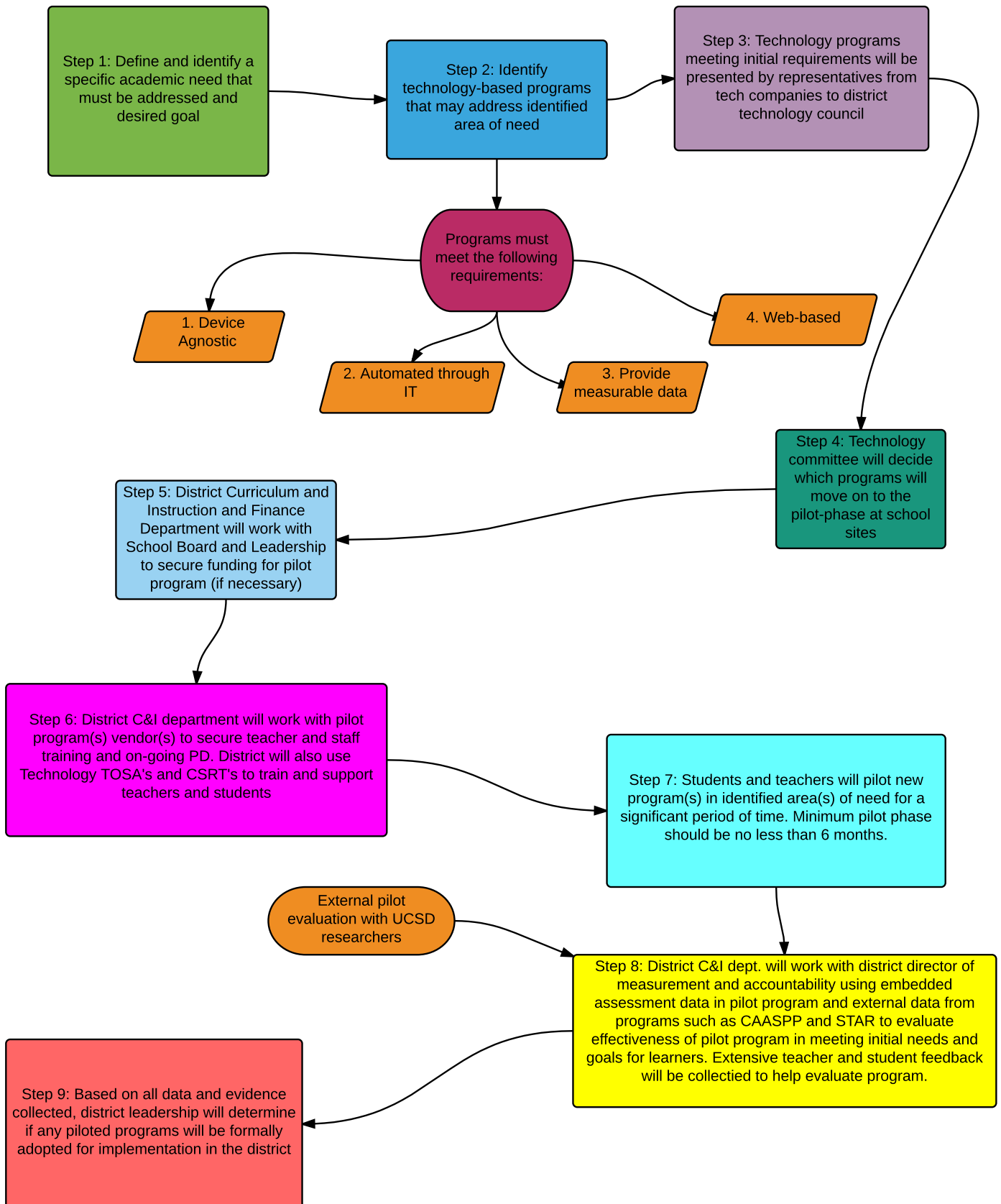
	Teachers	Media Specialists (METIs) & CSTs	School-level Administration	County-level Administration
Discover	Search websites Consult other teachers Participate in technology professional development Attend Ed-Tech conferences	Search websites Consult other METIs and CSTs Participate in technology professional development Attend Ed-Tech conferences	Support teachers, METIs, and CSTs Participate in technology professional development	Develop Online Marketplace Clearly communicate list of pre-approved apps Avoid mass-emails to teachers
Pilot	Investigate program, track student performance, seek input from other teachers Desired characteristics: promotes engagement, easy logins, differentiated instruction, built-in assessments, addresses state standards	Communicate piloting information to teachers, parents, and students Train teachers Provide classroom support as needed Collect student and teacher data Report program details to administration	Understand the program: costs, and expected student & teacher outcomes Connect with other schools currently using the resource (via Online Marketplace) Report student and teacher data to the County	Collect student and teacher data from schools and make available on Marketplace
Purchase	If available, use classroom funds Be aware of purchase request procedure Plan up to one year ahead	If available, use earmarked METI funds Train teachers on purchase request procedure	Provide clear purchase request procedure Make technology hardware a budget priority Clearly communicate budget with all staff	Consider writing grants on behalf of schools Make technology hardware a budget priority
Implement	Be aware of hardware request procedure Ensure technology is in usable condition Continue tracking performance data	Train teachers on hardware request procedure Ensure technology is in usable condition Continue collecting performance data	Consider implementing Bring Your Own Device (BYOD) Consider providing a computer lab instructor Continue reporting performance data	Continue collecting and reporting performance data on Online Marketplace
Perpetuate	Support less tech-savvy teachers Participate in technology professional development Attend Ed-Tech conferences	Train teachers on available resources Conduct ongoing hardware updates and maintenance Participate in technology professional development Attend Ed-Tech conferences	Organize school-level professional development activities (seek topic input from teachers) Make technology a budget priority	Continue to make technology a budget priority Seek user feedback for Online Marketplace

Appendix 2: Pilot-to-Purchase Rubric

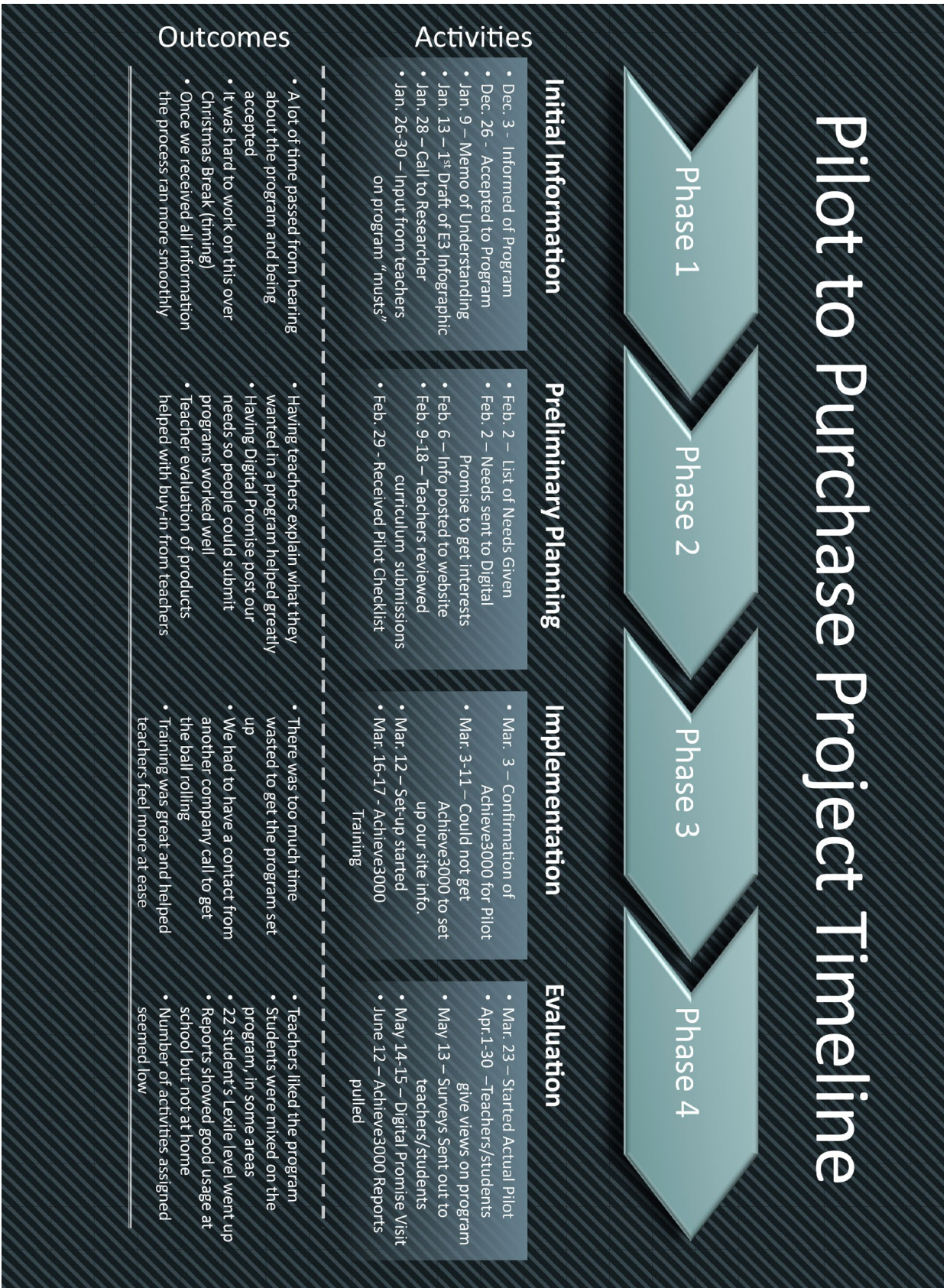
APPENDIX B—SOUTH FAYETTE EXPECTATIONS FROM CMU

<h1>STEM Robotics Organizational Expectations</h1> <p>for the program to be successful</p>		
Pre-requisites	During the Program	Intermediate Outcomes
<p>The host organization must...</p> <ol style="list-style-type: none"> 1) Have an adequate IT/computing environment (student computers and internet access) 2) Maintain these IT resources adequately 3) Have administrative support for a program that focuses on mathematics and computational thinking 4) Be willing to commit requisite inclass time to implement the mutually agreed curriculum over the life of the project <p>Students must...</p> <ol style="list-style-type: none"> 1) Be willing to work hard on mathematics and computational thinking 2) Have an openness to learning 3) Not already be "at ceiling" with mathematics, computational thinking, and robotics <p>Teachers must...</p> <ol style="list-style-type: none"> 1) Believe that mathematics and computational thinking are important to STEM careers 2) Have basic computer fluency 3) Be willing to work with students to help them to solve problems 4) Be willing to attend Professional Development sessions 5) Be willing to participate in paid workshops with CMU and Pitt to develop a plan to integrate a STEM Robotics Program into their school's curriculum <p>Researcher will...</p> <ol style="list-style-type: none"> 1) Provide PD sessions 2) Provide software 3) Provide hardware for initial implementation 4) Check IT infrastructure 	<p>Expect the Curriculum to focus on...</p> <ol style="list-style-type: none"> 1) STEM tasks with connections to mathematics and computational thinking (CT) that lead to student math and CT understanding 2) STEM tasks with high levels of cognitive demand 3) Tasks that build toward a generalized understanding of mathematics and CT <p>The host organization should expect...</p> <ol style="list-style-type: none"> 1) To continue providing active support involving both administrators and educators 2) To adapt to meet students' needs to ensure the maximum benefit from the curriculum 3) To have researchers observe teachers teaching and students learning <p>In Professional Development, educators should expect to learn...</p> <ol style="list-style-type: none"> 1) Strategies to generate cross-contextual examples that lead to learning transfer 2) How the curriculum supports the development of student understanding of mathematics and CT 3) How to recognize common student misunderstandings and how to correct them 4) How to present the curriculum in a way that scaffolds each lesson's instructional goals 5) How to implement a STEM Robotics Classroom 	<p>Students in the program should begin to...</p> <ol style="list-style-type: none"> 1) See math and programming as important to achieve the goals and activities in the curriculum 2) Develop improved communication skills, especially in technical writing 3) Feel an increased sense of competence in mathematics, programming, and/or STEM careers 4) Develop a belief that math is not a "subject" but a tool for other ends 5) Develop a believe that they can program <p>Teachers in the program should...</p> <ol style="list-style-type: none"> 1) Present lessons the same way that they are modeled in the PD sessions 2) Use questioning strategies the same way that they were modeled in the PD 3) Feel comfortable with the curriculum and confident that when it is implemented properly that students are learning <p>The host organization should expect ...</p> <ol style="list-style-type: none"> 1) To see the benefit of the program 2) Professional effort from CMU and PITT that lead to improved student learning 3) Timely reports from CMU and PITT that document all stakeholders progress on the project

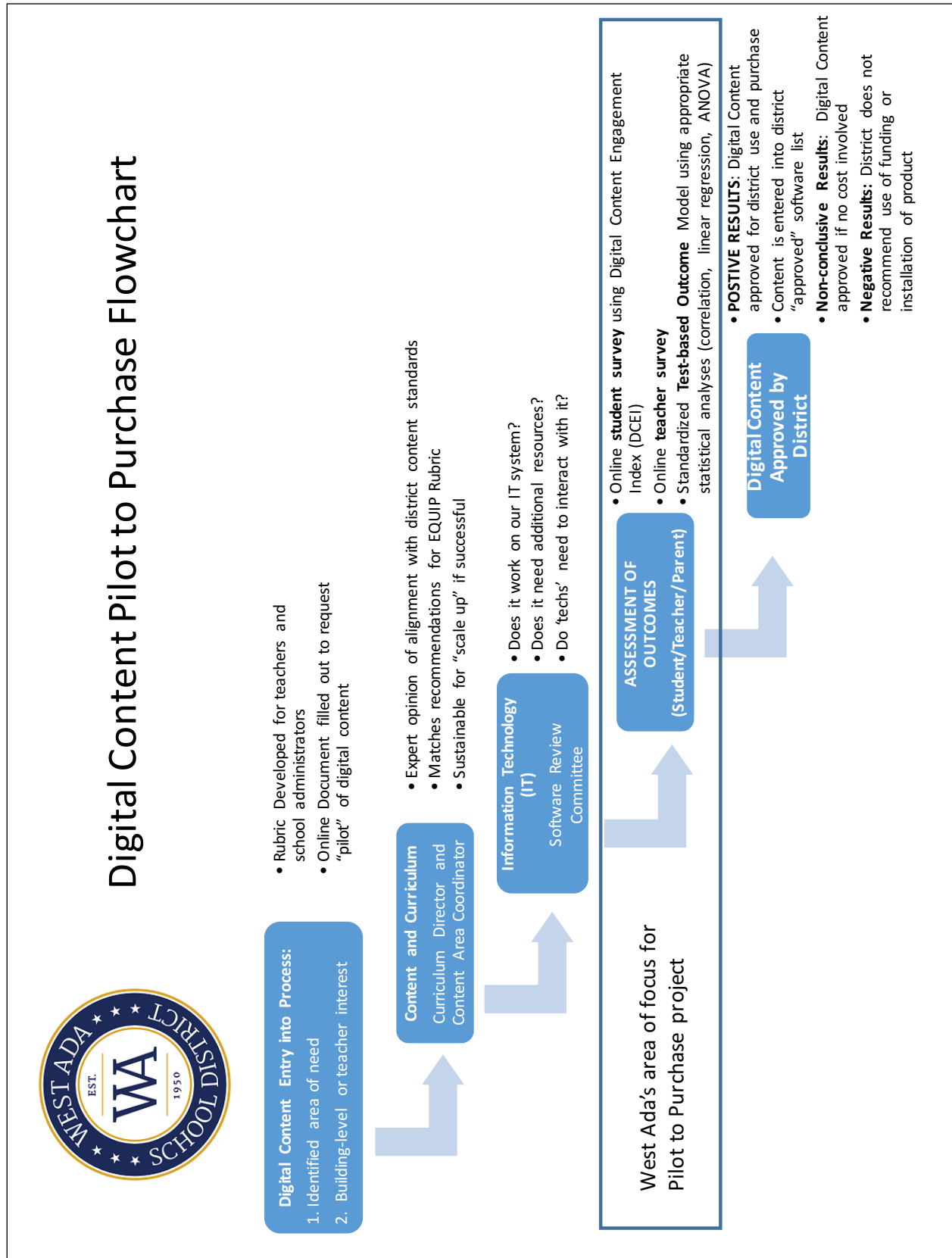
APPENDIX C—VISTA FLOWCHART



APPENDIX D—PIEDMONT TIMELINE



APPENDIX E—WEST ADA PROCESS DIAGRAM



APPENDIX F—PILOT PLANNING CHECKLIST

1. Planning for Getting Started

Needs and Goals

Conduct a needs assessment to determine areas where a technology-learning product might be most helpful.

Research products intended to address needs and goals.

Considerations include product cost (for piloting and full implementation), IT requirements (i.e., hardware, bandwidth, etc.), vendor support services, district goal or need alignment, district standards and curriculum alignment, ease of use, data privacy and security requirements, data sharing protocols, and others.

Establish student outcome goals for program success (ex. Lexile levels up by 20% among students in group X).

Relationship with vendor

Establish vendor agreement with pilot terms and expectations (product access, pricing and timelines for pricing, PD, timelines for implementation and evaluation, targets, evaluation plan and metrics, etc.).

Confirm agreement on the “if-this-works” plan; i.e., clarify what will happen if targets are met (e.g., contract, competitive RFP, etc.) and when.

Establish main points of contact between district (or school) and vendor.

Communicate relevant timelines and policies, including key budget dates, purchasing rules (e.g., purchase thresholds that trigger certain processes), school and testing calendar, and no-contact periods.

2. Planning for Running the Pilot

Professional Development

Plan professional development for teachers using the product.

Considerations include whether PD is provided by the vendor, cost of PD, whether PD is on-site, off-site, or online, whether PD will be one time in the beginning or are ongoing.

Create a training plan consisting of participants, dates, materials needs, real or virtual spaces, etc., with dates for startup and follow-up training.

Recruit early adopters to train with vendor-trainers to create sustainable in-house PD for successful pilot implementation.

IT and Logistics

Evaluate pilot compatibility with current infrastructure (i.e., device compatibility, bandwidth needs, etc.).

Assess on-site IT support needs.

Confirm product support available from vendor.

Determine how product use fits into daily/weekly schedule.

Communication within district

Establish main points of contact for communication with teachers about questions/concerns regarding pilot.

APPENDIX F—PILOT PLANNING CHECKLIST *(continued)*

Communicate clearly to stakeholders the pilot timeline, goals, expected outcomes, and decision-making process.

Set up touch points among leadership to ensure alignment across IT, instruction, and the business office.

3. Planning for Evaluation and Next Steps

Evaluation

Create an evaluation plan, including whether/how to use comparison groups.

Identify assessments and other measures that will be used to gather data.

Establish the baseline (i.e., pre-tests/existing data).

Determine internal evaluation capabilities, including data collection, sharing, monitoring, analysis, interpretation, and reporting.

Decide whether outside support is needed (consultant or research university).

Confirm data available from the vendor, including format and frequency.

Determine where the information from the evaluation will live and how relevant stakeholders can access it.

Plan to informally collect student and teacher feedback during the pilot.

Create a formal mechanism for collecting and reviewing student and teacher feedback (surveys, discussion panels, etc.)

Determine how to interpret findings and make decisions about next steps.

Sustainability

Identify going-forward IT requirements for sustaining the product if successful.

Assess the feasibility of paying for the program after the pilot.

Identify going-forward budget approach if the product is successful.

Determine going-forward purchasing process used if the product meets needs effectively (results permit direct purchase, results inform competitive RFP not limited to the piloted product, etc.) and identify any factors that affect which process is used (e.g., size of purchase, type of product).

Create a plan for long-term budgeting for product sustainability.

Align the pilot timeline with budget and purchasing timeline constraints, if any.

APPENDIX G—DIGITAL PROMISE STUDENT SURVEY QUESTIONS

Introduction

This spring, your district was involved with piloting (trying out) one of the following programs in your classrooms: ALEKS, IXL, BrainPOP, STMath, Achieve 3000, or VEX IQ/Atlantis. This survey asks you questions about your experience participating in the pilot of one of these programs. We would like to hear from you about your experience with the pilot. The questions you are about to be asked are related to the pilot in your district.

There are only twenty-three questions. We appreciate hearing from you. If at any time you do not want to continue this survey, you may stop at any time.

We really do want to hear from you, but if you decide not to complete the survey, there will be no impact on your involvement in piloting the program at your school or on your grades.

Thank you for letting us know about your experience!

- 1) If your teacher has provided you with a unique ID number for this survey, please type this number into the box below, and then click the “next page” button. If you do not have a unique ID number for this survey, skip this question and click the “next page” button.

Using Technology to Help You Learn

- 2) Which educational-technology or software program are you using or did you use this spring in your school? Please choose from the list below:
 - a. ALEKS
 - b. Achieve3000
 - c. BrainPOP
 - d. IXL
 - e. Newsela PRO
 - f. STMath
 - g. VexIQ/Atlantis Virtual World
- 3) Did you know you were piloting (trying out) this program in your school?
 - a. Yes
 - b. No
- 4) In which district are you a student?
 - a. D.C. Public School System (DCPS)
 - b. Fulton
 - c. Piedmont
 - d. South Fayette
 - e. Vista
 - f. West Ada

APPENDIX G—DIGITAL PROMISE STUDENT SURVEY QUESTIONS *(continued)*

- 5) In which grade are you? (Answer options 1-12.)
- 6) On my report card, I earn:
- a. All As
 - b. Mostly As and a few Bs
 - c. All Bs
 - d. Mostly Bs and a few As
 - e. Mostly Bs and a few Cs
 - f. All Cs
 - g. Mostly Cs and a few Bs
 - h. Mostly Cs and a few Ds
 - i. All Ds
 - j. Mostly Ds and a few Cs
 - k. Mostly Ds and a few Fs
 - l. Mostly Fs and a few Ds
- 7) Is English your primary language at home?
- a. Yes
 - b. No
- 8) Are you of Hispanic, Latino, or Spanish origin (please choose one answer)?
- a. No, I am not of Hispanic, Latino, or Spanish origin.
 - b. Yes, Mexican, Mexican American, or Chicano
 - c. Yes, Puerto Rican
 - d. Yes, Cuban
 - e. Yes, another Hispanic, Latino, or Spanish origin
- 9) I identify as (you may choose more than one answer):
- a. American Indian or Alaska Native
 - b. Asian Indian
 - c. Black or African American
 - d. Chinese
 - e. Filipino
 - f. Gaumanian or Chomoro
 - g. Japanese
 - h. Korean
 - i. Native Hawaiian
 - j. Non-Hispanic White alone
 - k. Other Pacific Islander
 - l. Other Asian
 - m. Samoan
 - n. Vietnamese
 - o. White American
 - p. Two or more races
 - q. Other (please specify)

APPENDIX G—DIGITAL PROMISE STUDENT SURVEY QUESTIONS *(continued)*

- 10) How many class periods per week did or do you use the program in class?
- 1 class period per week
 - 2 class periods per week
 - 3 class periods per week
 - 4 class periods per week
 - 5 class periods per week
 - 6 class periods per week
 - Other (please specify)
- 11) How much time did you spend in class using the program? Choose the option that is closest to the amount of time you spent in class using the program.
- 15 minutes
 - 20 minutes
 - 30 minutes
 - 45 minutes
 - 60 minutes
 - More than 60 minutes
- 12) Did you have technical challenges (problems with the program not working as it should) with the product or program in your class?
- Yes
 - No
- 13) If you answered yes to question 12, please check the problems you had or write in your answer next to "other." You may choose more than one option.
- Internet connection was slow
 - Something was wrong with my robot; it would not work
 - The program crashed or froze while I was using it
 - Saving my work
 - Log-in trouble
 - Internet connection failed
 - Other (please specify)
- 14) In which class(es) did you use this program? You may choose more than one option.
- Art
 - English/Language Arts
 - History
 - Math
 - Music
 - Reading
 - Science
 - Social Studies
 - Technology
 - Other (please specify)
- 15) Were you able to use this program outside of school?
- Yes
 - No

APPENDIX G—DIGITAL PROMISE STUDENT SURVEY QUESTIONS *(continued)*

16) Did you use this program outside of school?

- a. Yes
- b. No

17) If you did not use this program outside of school, why not? (open-ended)

18) If you used this program outside of school, was it assigned for homework?

- a. Yes
- b. No
- c. Other (please specify)

19) Was the program that was piloted in your school easy for you to use?

- a. Yes
- b. No

20) Tell us what you think about your own learning related to the program. (Answer choices: strongly disagree, disagree, not sure, agree, strongly agree)

- a. I participate in class more often
- b. I am more confident in class
- c. I have improved my teamwork skills
- d. I am a better problem solver
- e. I am better at communicating verbally
- f. I try harder to complete my work
- g. I am more motivated to learn
- h. I am excited about learning when we use this program
- i. I am more engaged when we use this program
- j. The program helped me to understand what we were being taught in class

21) Tell us what you think about your teacher(s) using the program in your class(es).

(Answer choices: strongly disagree, disagree, not sure, agree, strongly agree)

- a. The program is easy for my teacher(s) to use
- b. The program improved how my teacher(s) taught class
- c. My teacher(s) were excited to use this program in class
- d. My teacher(s) understood how to use the program

22) Do you like the program that was piloted in your school?

- a. Yes
- b. No

23) Please tell us:

- a. What you like about the program
- b.

What you do not like about the program _____

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS

Introduction

This spring, your district was involved in piloting one of the following programs in your classrooms: ALEKS, Achieve 3000, IXL & BrainPOP, Newsela PRO, STMath, or VEX IQ/Atlantis. This survey asks you questions about your experience participating in the pilot of one of these programs. We would like to hear from you about your experience with the pilot. The questions you are about to be asked are related to the pilot in your district.

Other than anonymous demographic information, no sensitive items are included in the study, so the survey poses no foreseeable risk. Any potentially identifying information will be removed, thus ensuring that the final data set is completely anonymous. Upon publication of the results of the study, the dataset may be made publicly available through a research data repository.

You must be 18 years of age or older to participate. The survey should take no longer than 25-30 minutes to complete. All responses will be anonymous, but if you choose to be contacted for follow-up questions about the study, you will be asked to provide your email address. This identifying information will be stored separately from responses, thereby ensuring anonymity.

Your participation in this research is voluntary, and you may decline to participate without risk. While it is useful to be complete in your responses, you may skip any questions, and you are free to withdraw from the study at any time. We appreciate hearing from you.

If you have any questions about the study or procedures, please contact Dr. Valerie Adams-Bass (vnadamsbass@ucdavis.edu) at the University of California Davis School of Education.

Background

- 1) Which grades do you teach? Please select all. (Options 1-12)
- 2) What is your average class size?
 - a. Less than 15 students
 - b. 15-19 students
 - c. 20-25 students
 - d. 26-30 students
 - e. More than 30 students
- 3) How long have you been a teacher?
 - a. Less than 1 year
 - b. 1-2 years
 - c. 3-5 years
 - d. 6-10 years
 - e. More than 10 years

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- 4) How many years have you taught in this district?
 - a. Less than 1 year
 - b. 1-2 years
 - c. 3-5 years
 - d. 6-10 years
 - e. More than 10 years

- 5) What subject(s) do you teach?
 - a. English/Language Arts
 - b. History
 - c. Math
 - d. Music
 - e. Social Studies
 - f. Technology
 - g. Other (please specify)

- 6) In which age group do you fall?
 - a. Less than 20 years
 - b. 20 to 24 years
 - c. 25 to 29 years
 - d. 30 to 34 years
 - e. 35 to 39 years
 - f. 40 to 44 years
 - g. 45 to 49 years
 - h. 50 to 54 years
 - i. 55 to 59 years
 - j. 60 to 64 years
 - k. 65+ years

- 7) Are you of Hispanic, Latino, or Spanish origin (please choose one answer)?
 - a. No, I am not of Hispanic, Latino, or Spanish origin.
 - b. Yes, Mexican, Mexican American, or Chicano
 - c. Yes, Puerto Rican
 - d. Yes, Cuban
 - e. Yes, another Hispanic, Latino, or Spanish origin

- 8) What is your ethnicity/race? (You may choose more than one answer)
 - a. American Indian or Alaska Native
 - b. Asian Indian
 - c. Black or African American
 - d. Chinese
 - e. Filipino
 - f. Gaumanian or Chomoro
 - g. Japanese
 - h. Korean
 - i. Native Hawaiian
 - j. Non-Hispanic White
 - k. Other Pacific Islander

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- l. Other Asian
- m. Samoan
- n. Vietnamese
- o. Two or more races
- p. Other (please specify)

Pilot Information

- 9) How did you get involved with the pilot of [product X]?
- a. It was my idea
 - b. I was invited by a school or central office administrator; participation was optional and I said yes
 - c. I'm not; I was invited by a school or central office administrator; participation was optional and I said no
 - d. I was told by a school or central office administrator that we would do a pilot (it was required)
- 10) If you were not involved in the pilot, please indicate why not (open ended):
- 11) When did you start using [product x]?
- a. More than 1 year ago
 - b. Last school year
 - c. This past fall
 - d. This spring
 - e. I received it but have not started using it yet
 - f. I never received [product x]
- 12) Were you involved in selecting [product X]?
- a. Yes
 - b. No
- 13) If yes, how did you find/select [product X]?
- a. Product marketing materials
 - b. Other teachers
 - c. Literature review
 - d. School or district administrators
 - e. Other (please specify)
- 14) Do you provide feedback about the [product X] being piloted to your school administrators?
- a. Yes
 - b. No
- 15) If yes, please check the box(es) next to the ways that you provide feedback:
- a. Informal conversations
 - b. Surveys
 - c. Other (please specify)

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- 16) Are you using the software in your classroom?
- Yes
 - No
- 17) If yes, how often?
- Only 1-2 times a week
 - Only 3-4 times a week
 - Once a day
 - Multiple times every day
- 18) How many weeks did you use [product X] with students during the spring semester 2015? (Open ended)
- 19) On average, how many hours per week did students use the program outside of school?
- 0 hours
 - Less than 1 hour
 - 1-2 hours
 - 3-4 hours
 - 5-6 hours
 - 7-8 hours
 - More than 8 hours
- 20) On average, how many hours per week did students use the program during school?
- 0 hours
 - Less than 1 hour
 - 1-2 hours
 - 3-4 hours
 - 5-6 hours
 - 7-8 hours
 - More than 8 hours
- 21) Are you using the software to teach a single subject, i.e., Math, Language Arts, Social Studies?
- Yes, I use [product X] to teach one subject
 - No, I use [product X] to teach multiple subjects
- 22) Regarding your answer to question 21: If yes, in which class are you using this program?
- English/Language Arts
 - Math
 - History
 - Music
 - Social Studies
 - Technology
 - Other (please specify)

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- 23) Regarding your answer to question 21: If no, in which class(es) are you using this program?
- English/Language Arts
 - Math
 - History
 - Music
 - Social Studies
 - Technology
 - Other (please specify)
- 24) In which grades did you use [product X] this spring? Please select all. (Options 1-12)
- 25) Did you attend a PD training for the product?
- 26) If so, how long was the training?
- Less than 1 hour
 - 1 hour
 - 1.5 hours
 - 2 hours
 - 2.5 hours
 - 3 hours
 - Longer than 3 hours
- 27) Was professional development offered by district staff or the company?
- District staff
 - Company
 - Both
- 28) Was professional development provided online or in person?
- Online
 - In person
 - Both
- 29) When did you attend a training?
- During the fall of this school year
 - During the winter of this school year
 - During the spring of this school year
 - More than a year ago
- 30) Was the professional development you received sufficient to prepare you for piloting the product this spring?
- Yes
 - No

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

Use of product

- 31) Did you have technical difficulties with using the product in your class?
- Yes
 - No
- 32) If yes, please check the problems you had or write in your answer next to "other."
- Internet connection was slow
 - Internet connection failed
 - Program was not compatible with the current hardware in my classroom/school
 - Program crashed or froze during use
 - Other (please specify)
- 33) Check the statements that apply to how you utilized [product x]:
- As a core learning tool
 - To supplement your teaching
 - To replace direct instruction time
 - To enhance specific topics covered in your lesson plans
 - To review previously covered material
 - Other (please specify)
- 34) Did using the product in your class:
- Increase your lesson planning time?
 - Decrease your lesson planning time?
 - Made no difference in your lesson planning time?
 - Not sure if there were changes in lesson planning time?
- 35) How many digital tools do you use with students?
- None
 - Only 1
 - 3-4
 - 4-5
 - More than 5
- 36) How many of these did you choose?
- None
 - Only 1
 - 3-4
 - 4-5
 - More than 5
 - All of them
- 37) Please select the appropriate phrase that describes your attitude towards the following statements (answer choices: strongly disagree, disagree, not sure, agree, strongly agree):
- This program aligns with our state curriculum standards
 - The program/product I piloted at my school aligns with our district curriculum
 - I feel very competent using the program I piloted in my classroom

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- d. The program I piloted is easy for me to use
 - e. The program I piloted is easy for my students to use
 - f. My competence using tech products in my classroom has grown because of my participation in this pilot
- 38) Check the observations you made about your students using the product (answer choices: strongly disagree, disagree, not sure, agree, strongly agree):
- a. My students demonstrated improvements in problem solving
 - b. My students demonstrated improvements in verbal communication
 - c. My students demonstrated improved confidence in class
 - d. My students participated in class more often
 - e. My students demonstrated improved teamwork
 - f. My students are excited about learning when we use this program
 - g. My students are more engaged when we use this program
- 39) What did you notice about the improvement in your students' grades?
- a. Most of my students' grades improved
 - b. Some of my students' grades improved
 - c. Few of my students' grades improved
 - d. None of my students' grades improved

Opinions

- 40) Did you like the program?
- a. Yes
 - b. No
- 41) Would you recommend the continued use of this program?
- a. Yes
 - b. No
- 42) Are you aware of your district's budgeting and procurement process and calendar as they relate to educational technology decisions?
- a. Yes
 - b. No
- 43) Rank the following statements in order of importance, regarding what you believe should be used to evaluate a product during a pilot (instructions: drag and drop the answer choices, placing what you feel is most important at the top of the list and least important at the bottom. Please make sure to select "finished sorting" when complete).
- a. Student test score data
 - b. Student feedback
 - c. Teacher feedback
 - d. Student grades
 - e. Student attendance
 - f. Student behavior

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- 44) Whose conclusion will most likely be used to make product procurement decisions?
- Teachers' conclusions matter most in our district
 - Administrators' conclusions matter most in our district
- 45) Which of the following were significant challenges for you in participating in the pilot?
Please check all that apply.
- Not enough preparation time before students started using the product
 - Duration of pilot insufficient to evaluate the product
 - Insufficient training or support during the pilot
 - Conducting the pilot in the spring semester was a problem; fall would have been better
 - State testing got in the way, took time away from the pilot
 - Students experienced problems with devices or Internet access in school
 - Other (please specify)
- 46) If the results of the pilot are positive and the school or district wants to purchase continued access to [product X] for teachers and students, will the district have the authority to do so?
- Yes
 - No
 - I don't know
- 47) If the results of the pilot are positive and the school or district wants to purchase continued access to [product X] for teachers and students, will the district have the money to do so?
- Yes
 - No
 - I don't know

Product Functioning

- 48) I think that [Product X] provides enough content:
- Strongly disagree
 - Disagree
 - Not sure
 - Agree
 - Strongly agree
- 49) When determining which product to pilot, how important are the following product features? (Answer choices: very unimportant, unimportant, not sure, important, very important)
- Product provides a pre-assessment
 - Product provides a post-assessment
 - Content can be accessed when offline
 - Bug free: program loads and runs without error
 - Data can be easily collected/compiled to be analyzed
 - Teacher guides includes suggestions for classroom use, lesson plans, and related activities

APPENDIX H—DIGITAL PROMISE TEACHER SURVEY QUESTIONS *(continued)*

- g. Technical support is available online
- h. Technical support is available by phone

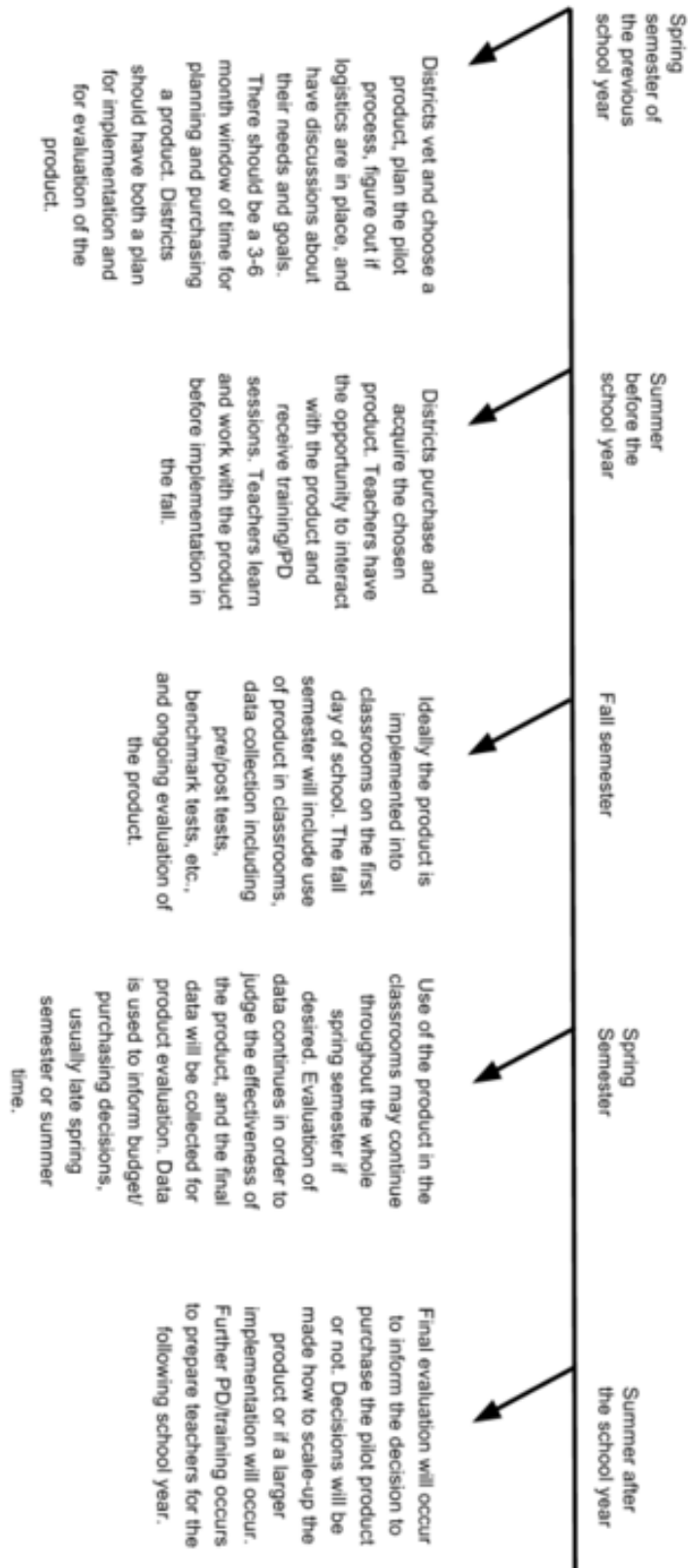
Closing

- 50) How important is it to you that educational technology products are aligned with your teaching instruction and preferences?
- a. Very unimportant
 - b. Unimportant
 - c. Not sure
 - d. Important
 - e. Very important
- 51) How often do you ask students for feedback about their learning experiences with digital technologies?
- a. Every day
 - b. One or two times a week
 - c. Once a month
 - d. Only at the end of the semester
 - e. Never
 - f. Other (please specify)
- 52) How long should companies expect their products to be piloted before districts determine how useful it is to teachers and how effective it is for students?
- a. Less than one month
 - b. 1 month
 - c. 2-3 months
 - d. 4-5 months
 - e. 6 months-1 year
 - f. More than 1 year
- 53) During what part of the school year should a product be piloted? (Open ended)
- 54) What has been your overall experience with this pilot? (Open ended)
- 55) Would you be willing to participate in a follow-up conversation? If so, please enter your name and email address. (Open ended)

APPENDIX I—DISTRICT BUDGET TIMELINES

	Aug '14	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July '15
South Fayette	Budget process starts	Mid-Sept: budget guidance is sent out	Preliminary budget developed Oct-Jan	Budget planning	Budget planning	Budget planning; preliminary budget approved in Jan	Budget adjustments made through May	Budget adjustments	Budget adjustments	Proposed final budget approved in May	Final budget approved	By July 1, there will be a strategy for purchasing for the upcoming school year
West Ada							Feb-March: departments put together budget presentations	Departments put together budget presentations		Budget approval meetings in the spring: May or early June	Ideally end of May for budget approval but was June 23 in 2015	July 1 starts new fiscal year
Vista	School year begins; pilot process begins with classroom implementation	Pilot process (classroom use)	Pilot process (classroom use)	Pilot process (classroom use)	Pilot process (classroom use)	Negotiations with company	Negotiations with company	Need to have items in mind for budget	Community forums for budget	Community forums for budget	Board approval: first read and then approval	Product is ready for implementation next school year: fiscal year begins July 1
Piedmont												For Achieve 3000, decision to purchase will be made by August 1, 2015
Fulton	Need to spend all allotted school money by August	Grant funding available at end of Sept to make decisions					Budget planning begins	Budget planning			Teachers evaluate tools during the summer months	District funds are available July 1 to make decisions; ideally, purchases are made in July
DCPS	Purchasing occurs in the summer		Oct 1: start of new fiscal year			Budget developed in the winter	Budget is developed in the winter		City council reviews budget			Purchasing occurs in the summer

APPENDIX J—IDEAL PILOT TIMELINE



APPENDIX K—LOGIC MODEL

Pilot-to-Purchase RQ: What is the process that school districts employ when piloting a tech-based learning platform/software?					
Objective: to define a pilot process that school districts can use to evaluate tech learning to tools to make purchasing decisions.					
Inputs/ Resources	Target Population	Activities/ Services/ What's Happening in Schools	Outputs (Services) In What Ways Will We learn from What's Happening?	Outcomes	
				Short-Term (Satisfaction)	Mid-Term (Benchmarks)
Funding "Wired" schools Students	League of Innovative Schools district-level administrators who make decisions about learning software investments Teachers Students Software suppliers	Teacher PD for software/learning programs Students' engagement in learning platforms Needs assessment Product discovery Implementation Evaluation Procurement	Focus groups; students, administrators, teachers Surveys; teachers & students Interviews; teachers, administrators Technical support to schools Classroom observation Provide community space for learning across districts	Defined process for piloting tech- learning software; rubric for districts Definition of a successful pilot for districts Learn what variables districts consider when selecting software to purchase. Student improvement Teacher improvement Research briefs for DP community Research briefs for K-12 community Research articles for academic research community Improved communication between schools and tech supplies Inclusion of teachers and students in tech selection process? Improved procurement process	Learn about improvement in student outcomes Help school districts make better purchasing decisions

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