PACIFIC
Research & Evaluation, LLC

TechSmart Initiative for Student Success

SY 18-19 Evaluation Report

PREPARED FOR

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Introduction

The Mt. Hood Cable Regulatory Commission (MHCRC) launched the TechSmart Initiative for Student Success in fall 2014, with plans to strategically invest a total of about $19 million through 2021 in local public schools to positively impact academic outcomes for all students in Multnomah County. The TechSmart Initiative provides grants and evaluation resources for Multnomah County school districts to identify effective classroom instruction that uses technology to foster improvement in academic outcomes for all students and to share the successful strategies across the school districts. The TechSmart Initiative is aligned with the collective effort of the broader community engaged in the All Hands Raised Partnership. The MHCRC invests in District efforts to close the achievement gap and make progress on the following academic outcomes key to student success:

Kindergarten Readiness ▮ 3rd Grade Reading ▮ 8th Grade Math ▮ 9th Grade Credit Attainment ▮ High School Graduation ▮ English Language Learners' Annual Progress

The MHCRC worked closely with each school district as a planning and funding partner to develop a grant project plan tailored to each individual district's priorities. The MHCRC has two overarching goals for the TechSmart Initiative:

Goal 1: School districts funded by MHCRC grant investments will understand and implement effective instructional strategies and practices that use technology to foster improvement in academic outcomes for all students.

Goal 2: The MHCRC and school districts will validate and disseminate effective instructional strategies and practices that use technology to foster improvement in academic outcomes for all students.

The MHCRC developed a Framework for Successful Technology Implementation, which drew upon research and evidence-based practice for successful implementation of technology integration in education. Pacific Research and Evaluation (PRE), as the leader of an evaluation for the TechSmart Initiative, worked with MHCRC and its staff to design an evaluation around the Framework and create a logic model with outcomes for each of the seven factors described below. A copy of this logic model is included in the evaluation planning tool in Appendix A.

The MHCRC framework encompasses seven factors identified as essential for schools to effectively transform into technology-rich teaching and learning environments. The factors are not isolated from each other; many are linked and substantially overlap.

- **Teaching Effectiveness:** District supports regular, inclusive and shared professional development among teachers.
- **Digital Age Learning Culture:** District embraces cultural shift and views technology as positive.
- **Visible Leadership:** District leaders are actively involved and working with key communities to accomplish change.
- **Data-Driven Improvement:** Current, relevant and high-quality data from multiple sources are used to improve schools, instruction, professional development and other systems.

- **Funding & Budget:** District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.
- **Strategic Planning:** District's strategic plan reflects shared commitment to improving outcomes for students.
- **Engaged Communities & Partners:** Parents, stakeholders, community groups and others are actively and systemically involved in helping students develop, learn and achieve.

The TechSmart logic model includes short-term, intermediate, and long-term outcomes within each of these elements. This evaluation report assesses the short-term outcomes associated with each element of the framework. To assess these outcomes within each district, PRE and the MHCRC program manager worked with each district to develop an evaluation planning tool (see Appendix A). Table 1 shows when each district received its TechSmart grant funding and the project's area of focus.

Table 1. Grantee Funding Date and Focus Area

District	Year Funded	Grade	Focus Area
David Douglas	2014; 2018	K-3	Kindergarten Readiness (first grant); 3rd Grade Reading (first grant); 8th Grade Math (second grant); ELL (both grants)
Parkrose	2014	9-12	9th Grade Credit Attainment; High School Graduation; ELL
Reynolds	2015 2020	7-9 9-12	8th Grade Math; ELL (first grant) 9th grade credit attainment; Attendance High School Graduation; ELL (second grant)
Portland Public Schools	2015	K-3	3rd Grade Reading; ELL
Gresham-Barlow	2016	K-3	3rd Grade Reading; ELL (first grant) 8th Grade Math; ELL (second grant)
Centennial	2018	7-9	7th-9th Grade Math and Science; ELL

Table 2 is a timeline for the TechSmart grant investments for each district. David Douglas and Parkrose were the first grantees in 2014-15 (SY 14-15). David Douglas wrapped up its initial grant in the 2016-17 school year (SY 16-17), and received a second grant and began implementing again in the 2018-19 school year (SY 18-19). Parkrose finished grant implementation in the 2017-18 school year (SY 17-18) so is not included in this report. Reynolds School District received its grant in SY 15-16 and began implementation immediately. Reynolds received its second grant and began implementation in 19-20. Portland Public Schools received a five-year grant in 2015 and used the SY 15-16 as a planning year, with implementation starting in SY 16-17. In 19-20, PPS received a grant extension through SY 21-22. Gresham-Barlow School District began implementation of it's first grant in SY 16-17 and it's second in SY 19-20. Centennial School District began implementation in SY 18-19.

Table 2. Grant Timelines

District	SY 14-15	SY 15-16	SY 16-17	SY 17-18	SY 18-19	SY 19-20	SY 20-21	SY 21- 22
DDSD								
Parkrose								
Reynolds								
PPS		Planning						
GBSD						Overlap		
Centennial								

This report describes evaluation results for the six districts who were within their grant implementation period during SY 18-19 (i.e., all districts listed in Table 2 except for Parkrose). Project descriptions for each of these school districts are included below, followed by the data collection methods used for evaluation in each district during SY 18-19, results specific to each district, and a summary of results across all grants. Each district's section of this report is organized by the Framework factors with corresponding evaluation questions and outcomes. Each section also includes a project summary as an introduction to the evaluation results.

Project Descriptions

David Douglas School District

David Douglas School District (DDSD) began implementation of its first MHCRC TechSmart grant during SY 14-15 through SY 17-18 with PreK-3rd grade classes at Earl Boyles Elementary School. The grant allowed for the purchase of equipment such as iPads, Chromebooks and Smart Boards and also funded extensive professional development (PD) to support teachers and staff members in transitioning to and understanding effective uses of online digital content and resources that utilize technology to create engaging and supportive learning environments for all students. DDSD's goal for these efforts was to improve Kindergarten readiness, 3rd grade reading outcomes, and English language learners progress.

DDSD received another grant with implementation beginning in SY 18-19 with both Mill Park Elementary School and Menlo Park Elementary School. The second grant allows for hardware and software purchases, such as the Imagine Learning curriculum to target needs of ELL students, Smartboards, RedCat audio systems, Chromebooks, and tablets. Additionally, the second grant includes a technology integration coach to share between the two schools. Goals include increased student achievement in mathematics and closing the achievement gap of historically underserved populations.

Parkrose School District

Parkrose School District's (PSD) MHCRC TechSmart grant began implementation of its TechSmart grant in SY 14-15 and was funded through SY 17-18. This grant provided technology infrastructure and teacher PD to support one-to-one student devices at Parkrose High School and also funded PD to support high school teachers in transitioning to the use of online digital content and resources that take advantage of technology to create effective learning environments for students. PSD's goal for these efforts was to

improve the district's performance on the student success indicators of 9th grade credit attainment, English language learners progress, and high school graduation.

Reynolds School District

Reynolds School District's (RSD) MHCRC 4-year TechSmart grant was funded in SY 15-16 and focuses on improving student achievement in 8th grade math, 9th grade credit attainment, and English learners' progress. Through the grant, cohorts of middle and high school math teachers receive teacher and student technology devices including Microsoft Surface Pros (teachers), short throw projectors, Dell Venues (students), and 3D printers. In addition to receiving the devices, the math teacher cohorts participate in PD sessions in the summer prior to the school year and throughout the year that focused on using technology to support math education and English language development. SY 18-19 represented RSD's final year of grant implementation.

RSD's second TechSmart grant was funded in SY 19-20 and focused on expanding the work of the first TechSmart grant to the High School. The purpose of the Expansion of Constructivist Classrooms Across Reynolds High Schools (High School Expansion) project is to assimilate the use of instructional technology throughout the student and teacher instructional experience at the high school level. SY 20-21 will be RSD's first full year of implementation for this grant.

Portland Public Schools

Portland Public School District (PPS) received their five year TechSmart grant in SY 15-16 and after one year of planning began implementation in SY 16-17. The TechSmart grant is supporting the K-5 Equity-Based Balanced Literacy (EBBL) framework adoption at PPS. By the end of the grant, 20 schools across the district will have the opportunity to receive professional development and pilot the technological infrastructure provided by the funding. PPS's goal for these efforts is to improve 3rd grade reading outcomes and English language learners progress. PPS received an extension for this TechSmart grant that will provide funding through SY 21-22 and allow the district to extend TechSmart services to the district's remaining Title I schools.

Gresham-Barlow School District

Gresham-Barlow School District (GBSD) began implementation of its 4-year MHCRC TechSmart grant during SY 16-17 with Kindergarten through third grade classes at North Gresham Grade School and Kelly Creek Elementary School. The grant allows for the purchase of iPad devices for Kindergarten students and Chromebook devices for students in grade 1-3 and provides professional development (PD) to support teachers and staff members through the implementation of the grant. GBSD's goal for these efforts is to improve 3rd grade reading outcomes and English language learners progress.

GBSD's second TechSmart grant was funded in SY 19-20 and focused on Middle School Math. The purpose of the Embedding Technology in Middle School Math project is to provide intensive and targeted support for increasing student achievement in mathematics. The project will specifically target the achievement of 8th grade students and math credit attainment of students in 9th grade the following year.

Centennial School District

Centennial School District (CSD) began implementation of its 4-year MHCRC TechSmart grant during SY 18-19 with math and science students in grades 7 to 9. The primary focus of the grant is an integrated, hands-on, student-centered approach referred to as Project-Based Learning (PBL). The grant allows for purchase of Chromebooks for students and staff, projectors and document cameras for classrooms, digital microscopes and other experiential science technology, and Hapara licensing. The grant also includes a full-time STEM coach for the first three years, half-time STEM coach for the final year, and PBL-specific PD for teachers. CSD's goals include teachers' knowledge, implementation, and use of PBL strategies and improvement in student achievement outcomes, including closing achievement gaps for historically underserved populations.

Methods

Teacher Technology Surveys

Each district completed a teacher survey at one or two time points during SY 18-19, depending on the district's preexisting teacher surveys. The teacher survey asked questions about PD activities, technology skill level, frequency and level of technology integration, most commonly used digital resources, and the culture of support for technology integration in the district. For DDSD teachers, questions were added to the survey regarding the sustainability of the technology integration post-grant (see Appendix B).

Teacher Interviews

PRE conducted teacher interviews with a sample of teachers from each district during SY 18-19. Teacher interview questions focused on examples of enhanced instructional strategies, the usefulness of the PD activities, the culture of support for technology integration, the impact of the grant on student subgroups, and effects on student engagement and academic outcomes. For DDSD teachers, questions were added to the interview protocol regarding the sustainability of the technology integration post-grant. See Appendix C for the complete interview protocol.

District Leader Interviews

PRE facilitated district leader interviews or focus groups in spring 2019 with school principals, administrators, and technology coaches in each TechSmart district. Leaders discussed perceptions of teacher progress and student achievement outcomes related to the project, the district's strategic plan for technology including funding decisions, and how they were working to engage communities in their efforts. For DDSD leaders, questions were added to the interview protocol regarding the sustainability of the technology integration post-grant. See Appendix D for the complete interview protocol.

Student Surveys

For TechSmart projects targeting middle and high school students, a student survey was administered to answer questions on how technology in the classroom has affected student engagement and learning, and whether student opinions about the use of technology have changed as a result of the enhanced integration. Students provided examples of technologies that they would like to see more of in the classroom. See Appendix E for a copy of the survey.

Observation Tools

Leadership Observations

One of the elements of the TechSmart grant is to examine how technology is supporting effective instructional practices across the TechSmart grantees. In order to learn about this key outcome, PRE partnered with the TechSmart grantees and the MHCRC to develop a rubric that can be used to rate the use of technology to support instruction. The items were created using elements of the Danielson Framework[1] as described below. Teachers were asked to self-assess using the form on the year-end

[1] The Danielson Group (2013). The Framework for Teaching Evaluation Instrument. Retrieved from http://www.danielsongroup.org/framework/

survey and an online leadership observation form was used in SY 18-19 to gather observations of individual TechSmart classes. The form asked leaders to rate each observed teacher's use of technology and provide examples of how each teacher used technology to support instruction for at-risk subgroups. Each element of the form is described below. Raters were asked to evaluate the extent to which technology supports each aspect of instruction (See Appendix F).

- **Planning and Preparation**: Includes knowledge of content and pedagogy, knowledge of students, setting instructional outcomes, knowledge of and access to resources, designing coherent instruction, and designing student assessments.
- **Managing Classroom Procedures**: Includes instructional groups, transitions, materials and supplies, non-instructional duties, and efficient classroom procedures.
- **Organizing Physical Space**: Includes safety and accessibility, and arrangement of furniture and resources.
- **Communicating with Students**: Includes expectations for learning, directions and procedures, explanations of content, use of oral and written language.
- **Using Questioning and Discussion Techniques**: Includes quality of questions, discussion techniques, and student participation.
- **Engaging Students in Learning**: Includes activities and assignments, student groups, instructional materials and resources, and structure and pacing.
- **Using Assessment in Instruction**: Includes assessment criteria, monitoring of student learning, feedback to students, and student self-assessment and monitoring.
- **Demonstrating Flexibility and Responsiveness**: Includes lesson adjustment, response to students, and persistence.

Leaders from all districts completed observations, with a total of 42 observations at PPS, two observations at DDSD, five observations at GBSD, and four observations at CSD. RSD completed observations using their own walk through tool described below.

Leadership Rubric

In addition to the observations described above, those leaders who did not conduct individual observations were asked to complete the rubric "thinking about TechSmart teachers as a whole" following their leadership interview in the spring. Table 5 below details the leaders in each district who completed the leadership rubric.

Table 5. Leadership Rubric Participants

District	n	Role within District
David Douglas School District	2	One Principal; One Coach
Reynolds School District	1	One Principal
Gresham-Barlow School District	1	One Principal
Portland Public School District	5	Four Principals; One Coach
Centennial School District	2	One Assistant Principal; One Coach

Reynolds Walk Through Tool

RSD developed a district specific walk-through tool for the evaluation of their TechSmart grant and shared this data with PRE for inclusion in the Year 4 evaluation report. District administrators completed 13 observations for Cohort 1 teachers, 14 observations for Cohort 2 teachers, and 12 observations for Cohort 3 teachers. A copy of this tool can be found in Appendix G.

Project Status Reports

Each district submits grant project status reports twice yearly through the MHCRC grants management system. PRE and MHCRC staff developed the report requirements to provide updates from each district on various elements of the logic model. Information from the status reports relevant to the TechSmart logic model is used by PRE in the evaluation of a district's progress on TechSmart goals.

Student Achievement Data

PRE receives student-level data from the Oregon Department of Education (ODE) and directly from school districts to analyze the relationship between TechSmart investments and key student outcomes. The key outcomes examined for students are included in Table 1. Outcomes regarding 3rd grade reading and 8th grade math will be evaluated using data from the Smarter Balanced assessment, described below. There is a one-year time lag in the data PRE receives from ODE. As a result of this one-year time lag, the data presented in this report comes from SY 15-16, SY 16-17, and SY 17-18. Student achievement data for SY 18-19 are included in this report only in those instances that districts were able to provide PRE with student achievement data directly.

Smarter Balanced Assessment

Oregon is part of a team of states working together voluntarily to develop K-12 assessments in English language arts/literacy and mathematics aligned to Oregon's Common Core State Standards. These tests are called Smarter Balanced assessments. Delivered online, these tests include questions that adapt to each individual's performance and feature new "Performance Tasks" that mimic real-world application of students' knowledge and skills.

ELPA Assessment

The English Language Proficiency Assessment, or ELPA, is one of the required Oregon state assessments. The No Child Left Behind Act (NCLB) mandates that English learners in kindergarten through 12th grade are assessed annually to measure their level of English proficiency. The Oregon Department of Education developed the ELPA to meet this federal requirement and to provide a common assessment for all English learners in the state of Oregon.

Beginning in 2015-16, the state of Oregon began implementation of the ELPA21 assessment. The goal of ELPA21 is to provide online assessments that are aligned with the ELP standards adopted by the Oregon State Board of Education in 2013 and that best measure English Learner's mastery of the communication demands of the Common Core State Standards and the Next Generation Science Standards. As required by federal law, ELPA21 will continue to measure English proficiency in the four language domains of reading, writing, speaking, and listening. Additionally, ELPA21 consist of more interactive item types, especially for speaking and listening, compared with Oregon's former ELPA. ELPA21 scoring is quite different from Oregon's previous ELPA. There is not a single, more traditional composite score provided for ELPA21 results. Students receive an "Overall Proficiency Determination" which is a label and not a

numerical score. Students are labeled as “Emerging,” “Progressing,” or “Proficient.” Students receive four domain-level results that are on different scales. Domain results include both a numeric score and a proficiency label. The overall proficiency descriptors for ELPA21 are included in Table 6 below. Starting with data from SY 15-16, test scores for the ELPA21 assessment are included in this report. Because ELPA21 is scored differently, we will not be able to make comparisons to historical Cohorts.

Table 6. Official ELPA21 Proficiency Descriptions

	Proficiency Level Description
Emerging	Students are Emerging when they have not yet attained a level of English language skill necessary to produce, interpret, and collaborate on grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile of Levels 1 and 2 in all four domains. Students scoring Emerging on ELPA21 are eligible for ongoing program support.
Progressing	Students are Progressing when, with support, they approach a level of English language skill necessary to produce, interpret, and collaborate, on grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile with one or more domain scores above Level 2 that does not meet the requirements to be Proficient. Students scoring Progressing on ELPA21 are eligible for ongoing program support.
Proficient	Students are Proficient when they attain a level of English language skill necessary to independently produce, interpret, collaborate on, and succeed in grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile of Level 4 or higher in all domains. Once Proficient on ELPA21, students can be considered for reclassification.

Project Summary

David Douglas School District's (DDSD) MHCRC TechSmart grant focuses on math proficiency in grades 3-5, which the district determined to a primary barrier preventing students from graduating high school. To support the ultimate goal of improving student graduation rates and math proficiency, DDSD chose to implement several interventions throughout students' school careers. In part, DDSD's TechSmart goals work toward improving elementary math curriculum and instruction, especially for historically underserved populations, which are particularly prevalent in DDSD.

The three goals of DDSD's participation in TechSmart include: (1) to increase student achievement in the area of mathematics in grades 3-5. A technology integration coach was hired to work with the two TechSmart schools (Mill Park and Menlo Park). The coach worked half-time at each school during SY 18-19. Additionally, TechSmart funds were used to support professional development opportunities and purchase hardware and software to support student achievement, including the Imagine Learning curriculum to target needs of ELL students, Smartboards, RedCat audio systems, Chromebooks, and tablets.

A technology integration coach was hired to work with the two TechSmart schools (Mill Park and Menlo Park). The coach worked half-time at each school during SY 18-19. Additionally, TechSmart funds were used to support professional development opportunities and purchase hardware and software to support student achievement, including the Imagine Learning curriculum to target needs of ELL students, Smartboards, RedCat audio systems, Chromebooks, and tablets.

SY 18-19 represents the first year of TechSmart implementation at DDSD. As such, no student achievement data are presented in the following report, but these data will be incorporated in future reports as data become available and applicable.

Methods

A general description of the methods included in the TechSmart evaluation are included in the introduction to the full report. Data collection efforts for the SY 18-19 evaluation in DDSD are summarized below. Student outcomes (e.g., math achievement data) will be included in next year's report but are excluded from the current report, as student achievement data are not yet available over a period of time long enough to warrant conclusions.

Teacher Survey

A teacher survey was administered online to teachers in both August of 2018 and June of 2019. A total of 22 teachers completed the baseline survey in fall of 2018, with 11 from Menlo Park and 11 from Mill Park. A total of 20 teachers completed the year-end spring 2019 survey, with 11 from Menlo Park and 9 from Mill Park.

Teacher Interviews

PRE conducted phone interviews[1] with three teachers involved in the TechSmart grant. Two of the participating teachers worked at Mill Park, and one participating teacher worked at Menlo Park.

District Leader Interviews

PRE conducted three interviews[2] with leaders from DDSD, including the district's technology integration coach, who splits work time between Mill Park and Menlo Park, as well as one principal from Menlo Park and one student achievement specialist (SAS) from Mill Park.

Leadership Rubric

The leadership rubric was completed by the principal at Menlo Park and the district's technology integration coach.

[1] Quotations from interviews have been edited for brevity and readability.

Findings

The evaluation findings from the SY 18-19 evaluation at David Douglas School District are presented below and organized by the seven factors identified as essential for schools to effectively transform into technology-rich teaching and learning environments.

Teaching Effectiveness

Districts support regular, inclusive and shared professional development among teachers.

According to DDSD's project plan, the district planned to administer training on the LearnZillion math curriculum, Imagine Learning, and online tools during summer 2018. During SY 18-19, the district focused on ongoing coaching and training using their Professional Learning Team (PLT) structure. Much of the PD was performed by the district's technology integration coach, shared between both participating schools. At the end of SY 18-19, in June of 2019, PD focused on the augmentation and modification levels of SAMR was set to take place. The coach, who was previously employed at Earl Boyles and is thus familiar with many of the TechSmart goals, was frequently emphasized as an essential component of TechSmart work throughout the SY 18-19 evaluation. Both teachers and leaders described his success as a coach and his importance to the perceived success of TechSmart implementation so far within the district. When one teacher was asked whether they had suggestions for improving the PD model, they said:

> *I don't really have suggestions for improvement, which is interesting. I usually would have suggestions. But our coach, I can text him if I have a question. I could e-mail him and he'll be in the building, coming around to help me figure that out. So I haven't really needed any improvement on it. He's got a ton of energy. He's super excited to help people. And he teaches me through having me run through it rather than just showing me something. I'm not a tech-savvy person, and he's super patient with that.*

The value of the technology integration coach was reiterated among leaders, and among all teachers who were interviewed. One teacher said, "Our technology coach is a really amazing teacher. He has set up a spreadsheet where we can sign up for tech time with him. Almost any time of the week he'll be up at school to help with administering or using the technology in the classrooms. He'll come in and really have his expertise to aid the class in understanding something new. He has been the main person, I guess, that has given me any professional development so far this school year. He's done a few afterschool meetings to explain how things work, and he's always there to coach me and answer any questions that I have in using this technology. I haven't had to wonder or have questions that go unanswered for even a moment."

Generally speaking, teachers and leaders both expressed excitement and satisfaction with the PD model and the PD received. One leader shared, "It's going well. Time is always an issue, just with competing tasks. We're trying to get everything in one year, with the new math adoption and then having a lot of new technology. Our coach works half-time here and half-time at Mill. And he's been great. He's very responsive. He's proactive and he has great ideas. He does whole-group training with the teachers. He does small groups. He does individual coaching one-on-one. He does modeling in the classroom. That's

been really valuable, having that coach to brainstorm. He'll collaborate with our other coaches as well, with our student achievement specialists on how to best use the technology for math or whatever it is that we're working on in our PD and how we can model that using the Smartboards a little. We'll wheel a Smartboard into the library and use that during our PD for other things just so the teachers can see other ways to use it too."

Table 1 and Table 2 summarize the amount of group and individual PD that teachers received by the end of SY 18-19. The year-end survey data show that over half of teachers received between 1 and 8 hours of group PD, 30% received 9 to 16 hours of group PD, and 15% received 17 or more hours of group PD.

Table 1. David Douglas School District Hours of Group PD

Hours of Group PD	End of Year Survey (n = 20)
0 hours	0.0%
1-8 hours	55.0%
9-16 hours	30.0%
17-32 hours	10.0%
33+ hours	5.0%

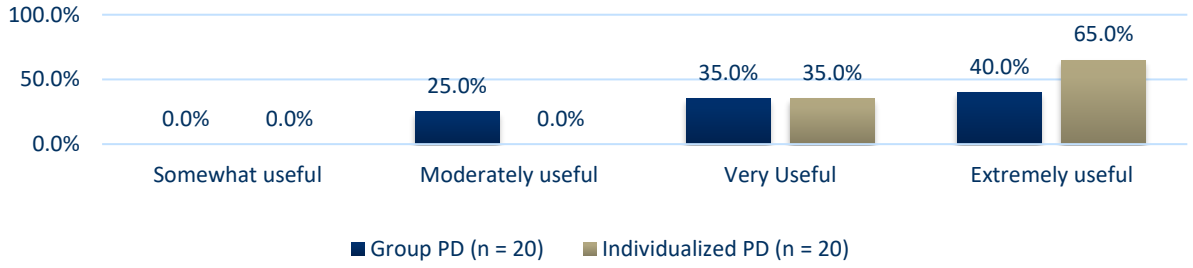
Table 2 shows that the majority (75%) of teachers received between one and eight hours of individual PD during SY 18-19. An additional 20% received 9 to 16 hours of individualized PD, and 5% received 17 or more hours of individualized PD.

Table 2. David Douglas School District Hours of Individualized PD

Hours of Individualized PD	End of Year Survey (n = 20)
0 hours	0.0%
1-8 hours	75.0%
9-16 hours	20.0%
17-32 hours	5.0%
33+ hours	0.0%

Teachers rated the usefulness of the group and individual PD at DDSD. Results are illustrated in Figure 1. Regarding group PD, the largest proportion of teachers (40%) rated group PD as "extremely useful." The same was true for individual PD, with 65% of teachers selecting "extremely useful" when rating individual PD. It is particularly noteworthy that all teachers selected "very" or "extremely" useful when rating individualized PD, as these ratings are consistently very positive. Ratings of group PD were also positive, but were more spread across the spectrum.

Figure 1. David Douglas End of Year Teacher Ratings of PD Usefulness



How is professional development impacting teacher instruction?

Section Highlights:

This evaluation question includes the following outcomes: 1) PD has helped teachers increase the use of technology for evidence-based instructional practices, 2) PD has helped teachers use technology to analyze and use data about student learning, and 3) PD has helped teachers use technology to differentiate instruction. During SY 18-19, both qualitative and quantitative data provided evidence that PD is positively impacting teacher instruction, both in teacher skill with integrating technology and teacher comfort level. Qualitative data showed that teachers are particularly satisfied with and benefitting from coaching and individualized PD, while quantitative data showed that average teacher skill level and comfort level increased from beginning to end of the school year.

On the year-end survey, a total of 16 teachers provided qualitative input when asked, "How effective has your TechSmart grant's professional development model been in terms of helping you change your instruction? Do you have suggestions for improvement?" Select results from these data are included as examples in Table 3. All teachers who provided responses expressed positive opinions of SY 18-19 PD, with many teachers emphasizing the value of coaching and individualized PD opportunities. Many teachers emphasized that PD has changed their instruction. Suggestions from teachers included different formats of accessing coaching time and additional lessons the coach could provide.

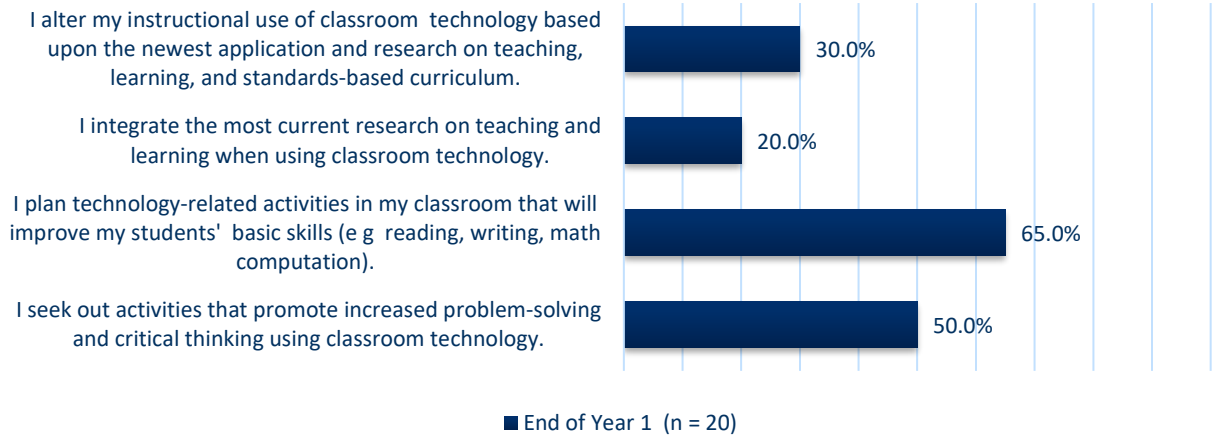
Table 3. Effectiveness of the PD Model at David Douglas

"The TechSmart Grant professional development was a perfect model for me! It allowed me all year, to sign up for time to have the coach, teach myself, or my class (modeling lessons)!"
"Amazing. The quality of presentations, the accessibility of materials, our math adoption scores, were all impacted by our TechSmart grant. Thank you."
"Great. The most effective thing is to be able to sign up for personalized help."
"It was helpful because I was able to upload assignments for a student who has an IEP. One suggestion is for the Instructional Technology Coach to help set-up whole classroom lists into websites etc. at the beginning of the year."

"I have been more reliant on technology in my classroom this year for instruction. One suggestion I have is for the tech coach to be in classrooms on a more regular schedule rather than individual sign up. I rarely signed up due to not knowing what I wanted him to demonstrate."
"It has completely changed my instruction and I can't imagine teaching without it now."
"The professional development was essential in implementing the tools and changes that I wanted to make in my instruction. Being able to have someone there to teach with me and help me when I wanted to take risks was very important. This is an important piece when asking teachers to use new tools, such as Smartboards and using various interactive tools with lessons."
"The coach piece has been the most effective. Having someone to ask questions, do research, help you figure out what tech is available and how to use it, has been by far the most effective when it comes to my instruction."

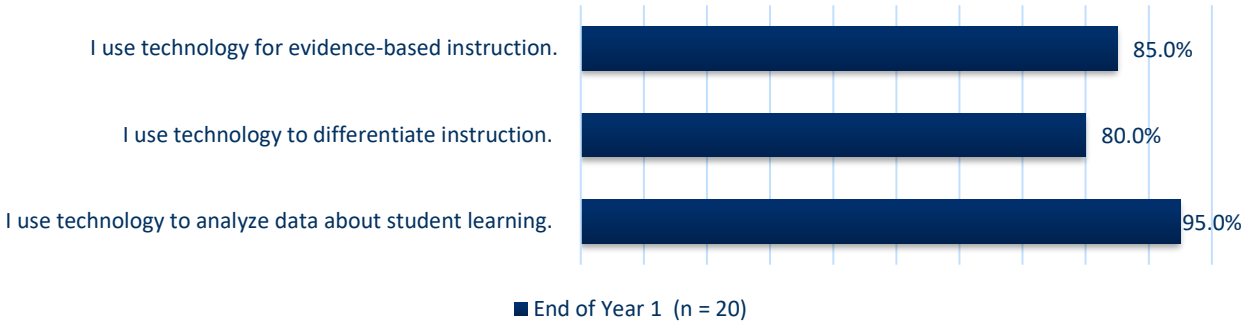
Teacher surveys at the end of SY 18-19 asked teachers to rate the degree to which several statements about instructional strategies were true of them. Responses are displayed in Figure 2. The majority of teachers (65%) indicated they plan technology-related activities to improve students' basic skills, while half of teachers (50%) indicated they seek out activities that promote problem-solving and critical thinking using technology. These results show, generally, that teachers seem to be planning and seeking out activities that promote student skills, but could be relying upon and utilizing research and best practices more often.

Figure 2. David Douglas Instructional Strategies
(% True of Me/Very True of Me)



The survey also asked teachers to describe the extent to which the PD increased their use of technology in various ways. Results from end-of-year surveys given to teachers are presented in Figure 3. The vast majority of teachers indicated that they use technology for evidence-based instruction (85%), differentiating instruction (80%), and analyzing and using data about student learning (95%) either "a moderate amount" or "a great deal."

Figure 3. David Douglas Instructional Technology Use
(% A Moderate Amount/A Great Deal)



Teachers reported their technology skill level on the beginning-of-year and end-of-year surveys by rating themselves at one of the following five levels:

Level 1: I get someone else to do technology-based tasks for me.

Level 2: I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job.

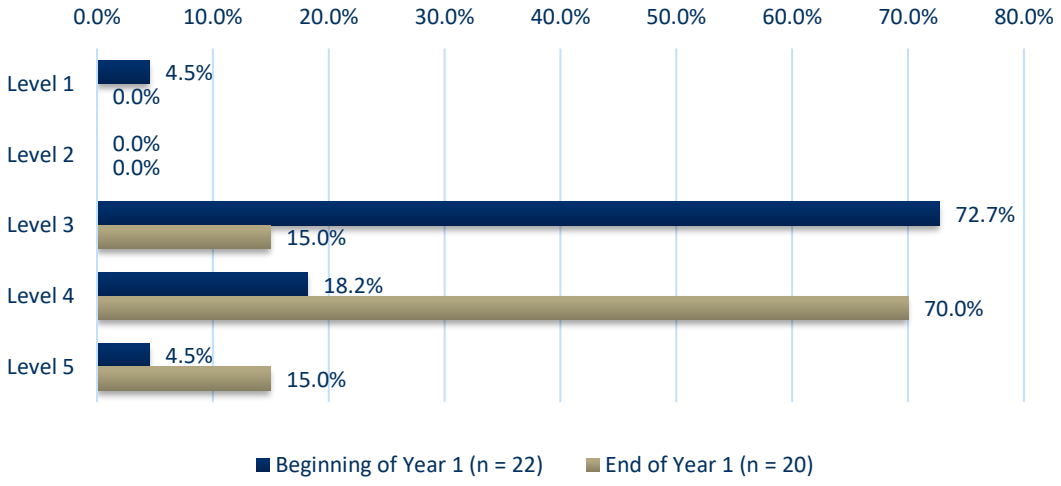
Level 3: I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose.

Level 4: I use a variety of technology tools and I use them efficiently for all aspects of my job.

Level 5: I use technology efficiently, effectively, and in creative ways to accomplish my job.

As illustrated in Figure 4, at the beginning of SY 18-19, the majority of teachers (72.7%) indicated their skill level at Level 3 of 5. An additional 18.2% of teachers indicated their skill as Level 4, and less than 5% of teachers indicated Level 1 and Level 5. By the end of SY 18-19, no teachers indicated their skill as Level 1 or 2, and the majority of teachers selected Level 4 (70%). An additional 15% of teachers selected

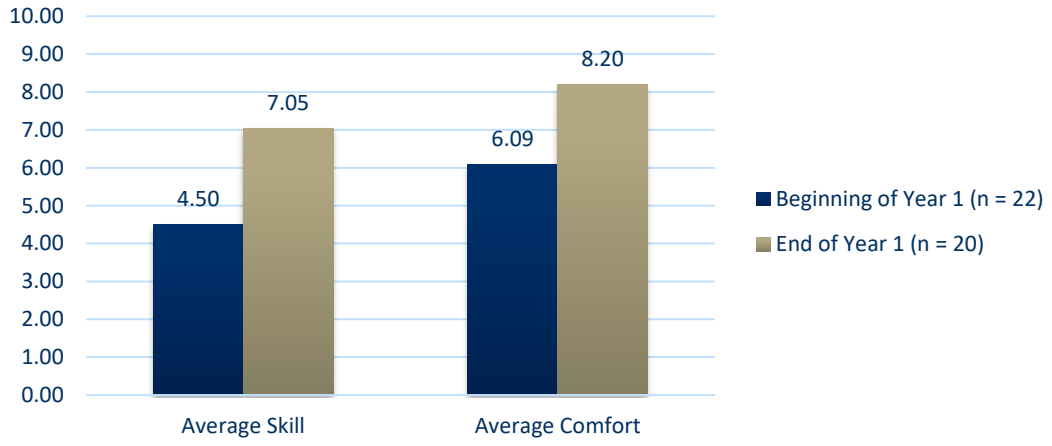
Figure 4. David Douglas Teachers' Technology Skill Level



Level 3 and Level 5. These results indicate that the overall perceived skill level generally increased substantially from the beginning to end of SY 18-19.

Teachers were also asked to choose a number on a scale from 0 to 10 that represents their overall skill at integrating technology into the classroom, and another number on the same scale that represents their overall comfort in using and integrating technology in the classroom. Results are displayed in Figure 5, which shows average self-reported skill and comfort levels with technology at both the beginning and end of SY 18-19. For self-reported skill level with integrating technology, the average report during the baseline survey was 4.50, while the average report during the end-of-year survey was 7.05. This represents a substantial increase in average self-reported skill. For self-reported comfort level, results were similar. Average comfort level increased from 6.09 at the beginning of the year to 8.02 at the end of the year.

Figure 5. David Douglas Teachers' Self-Reported Average Skill and Comfort with Technology



What new instructional strategies are teachers reporting?

Section Highlights:

Across surveys and interviews, teachers described the impact of technology on instruction. Some of the most frequently used tools include the Smartboard, RedCat, and Google programs like Google Classroom and Google Slides. Both teachers and leaders rated use of technology for planning and preparation and for engaging students in learning as particularly effective. Teachers shared numerous examples of how their instruction has shifted since TechSmart implementation began.

Teachers were asked to provide examples of instructional strategies that they believed had been effective in their classroom instruction and rate the strategies on a scale of one to five, with five being the most effective. Teachers answered this question by reporting instructional supports rather than strategies which is common in the early years of technology integration. Table 4 shows the ways in which teachers described use of technology, along with average effectiveness ratings. The most frequently mentioned instructional support was the Smartboard, with 10 teachers reporting this as an effective tool and an average effectiveness rating of 4.70. The next most frequently mentioned tool was Google Classroom, Google Slides, and/or Google Forms, with 7 teachers providing an average effectiveness rating of 4.57.

Epic! and Flipgrid were also mentioned by multiple teachers and both received effectiveness ratings of 4.50.

Table 4. How New Technology is Being Used for Instruction

Instructional Supports	Effectiveness Rating End of Year
Smartboard	**4.70** (n = 10)
Google Classroom, Google Slides, and Google Forms	**4.57** (n = 7)
Epic! Books	**4.50** (n = 4)
Flipgrid	**4.50** (n = 2)
Imagine Learning	**4.00** (n = 1)
Kahoots	**4.00** (n = 1)
Quizizz	**4.00** (n = 1)
LearnZillion	**5.00** (n = 1)
GoNoodle	**5.00** (n = 1)

Teachers were asked to self-assess their use of technology to support instruction using a rubric on the year-end survey. Leaders were also asked to complete the same rubric "thinking about their TechSmart teachers as a whole" following their leadership interview in the spring. The technology integration coach and one principal completed the rubric.

Table 5 presents results from leader rubric ratings and teacher self-ratings of teachers' use of technology to support instruction. Teacher survey data (i.e., first column of data) reflect self-ratings of technology use in teachers' own classrooms. Leadership rubric survey data (i.e., second column of data) reflect two DDSD leaders who provided ratings thinking about "TechSmart teachers as a whole." Teachers rated themselves highest in use of technology for engaging students in learning, as well as for planning and preparation. Leaders rated teachers highly in planning and preparation, organizing physical space, engaging students in learning, and using assessment in instruction.

Table 5. Technology Used for Supporting Instructional Practices
(1 = Not At All, 2 = Very Little, 3 = Somewhat, 4 = To a Great Extent)

	Teacher Survey (n = 20)	Leadership Rubric Survey (n = 2)
Planning and Preparation	3.60	4.00
Managing Classroom Procedures	3.15	3.50
Organizing Physical Space	2.65	4.00
Communicating with Students	2.95	3.50
Using Questioning and Discussion Techniques	3.05	3.00
Engaging Students in Learning	3.75	4.00
Using Assessment in Instruction	3.20	4.00
Demonstrating Flexibility and Responsiveness	3.05	3.50

In the rubric, leaders provided specific examples of how teachers use technology to support new instructional practices. One leader said, "I see some teachers using classroom apps to help manage student

behavior such as Class Dojo. Many teachers are able to have students show assessments in a quick and efficient manner with simple computer-generated exit tickets. The modeling and sharing of math thinking are enhanced with the technology. The class can save a discussion on the Smartboards from the day before and continue the 'math talk.'"

Leadership also commented on how teachers have used technology to support instruction for at-risk subgroups (i.e., students of color, ELL, SPED, and low SES). One leader provided several examples of ways technology has helped, including: "use of voice typing has helped students move along with their assignments; reads highlighted text from assigned PDF's from our digital curriculum; Special Ed teachers use a created Calendar from Smart Notebook to interact with students; Recorded buttons in Vietnamese helped a student follow directions in native language." Another leader shared:

I feel it has helped teachers to provide modifications, differentiation, and designing instruction that meets individual needs. I think it is empowering for students with writing challenges to be able to use co-writer and other resources. It is wonderful for students that may be reading below grade level to access books on Epic books so they can hear and begin reading books all of the classmates may be excited about. The technology really helps level the playing field.

In our interviews, teachers shared the ways they are integrating new strategies into their classroom using technology. Within DDSD, teachers seemed to perceive that their instruction has been transformed since beginning TechSmart and adding more technology integration. One aspect of TechSmart that was described and seemed particularly impactful is the physical technology resources provided, like the RedCat audio systems. One teacher said, "I use it all day," referencing the RedCat. Another teacher said, "Having the Smartboard just is a game changer. It makes it totally different. I love it." The same teacher later went on to say:

I think it's allowed me to try new things definitely like using FlipGrid for fluency and kids hearing themselves read. Having the Chromebook for every child that they consistently use is the main thing. There's a lot more that I want and I'm hoping to get an iPad at some point so I can be able to use that and be able to walk around the room. It opens up a whole new way to teach. It helps us go paperless and be able to organize our classrooms differently. I think the transition that our whole district needs to make is to teach teachers how to teach so that we are using the resources of technology and so it's not that kids are just sitting on the computer.

During the technology integration coach's interview, he shared information about the changes he has seen in teachers' instruction throughout SY 18-19. He said, "Their instruction with technology, it's changing, and the biggest change is in efficiency. With all the data that they have, with all the digital curriculum, and with the students doing the practice on the Chromebooks, it's really opened up teacher time. It makes teaching time way more efficient because they don't have to grade everything and even the lessons, they come alive because there's so much more interactive media that the kids are working with instead of just

watching a teacher up there just writing something. The teachers do these slide shows where they can manipulate objects and move things, and it just makes the lessons more alive."

How are the new instructional strategies impacting student engagement?

Section Highlights:

Interviews with teachers indicated that student engagement and excitement about learning has increased with more frequent and more intentional or strategic use of technology in the classroom. Teachers provided several examples of times when students showed engagement and enthusiasm.

In interviews, all three teachers provided feedback that indicated that student engagement has increased with more frequent technology integration and new instructional strategies. One teacher shared that they feel students' engagement increases as soon as students find out technology is part of a lesson. They said, "Kids are really excited to learn about computers and use them. That's first and foremost. They get excited when we are doing something with our Chromebooks, so the engagement is there before I've even shown them what the task might be." The same teacher went on to say how their instruction has changed as they have adapted to the students' enthusiasm about technology and learned more about how to leverage it to impact student learning:

> *When I first got Chromebooks, I was wary of what the kids were actually doing, but over the course of a couple years I've really learned how to pinpoint their specific needs using these programs that we have. I have the confidence now that when I say, "Hey, okay, go onto your Chromebooks," that it's not just this like free-for-all time. Even better than that, if you have kids who are able to do math or kids who are struggling with it, now I'm able to just completely change the activities to make sure kids are learning at their need, which increases engagement. They're engaged in what they're doing, as it's right at their specific level. I'm able to pull small groups, and that's really important.*

Another teacher talked about how technology helps them celebrate students' work, sharing, "I can project their essays and then have them edit. We can edit as a small group so they can share their essays and I'll read it and celebrate it. It's nicer to see it so easily, and knowing how to edit and revise them is really great." When asked a follow-up question of whether that has impacted student engagement for the better, the participating teacher said, "Yeah, definitely. I think the visual piece, having work displayed and celebrated has increased engagement."

A third teacher described efforts to integrate data into lessons so that students can see their achievement and progress. The teacher said, "The students know their scores from the tools we use. They're vested. They are ready to roll, and they know exactly what they need to get to be fluent. Our tech coach had done a little bit of that type of data use last year, so I just adjusted it to work for me. The kids were so proud of themselves and so excited. And I was so proud of them."

Are the new instructional strategies showing promise for improving academic outcomes?

Section Highlights:

While student achievement data were not yet available, both teacher and leader interviews indicated promise for improving student achievement outcomes. One teacher described improvements in test scores based on ability to practice the testing environment. Leaders described hope for the future and indicators of existing successes.

While student achievement data are not yet available for a long enough period of time to warrant inclusion in the current report, subjective data regarding the impact of technology on learning gathered from leader and teacher interviews are presented below. During interviews, one teacher described the critical role that technology has played in helping students prepare for testing.

Third grade is the first year that they take their standardized test. That's kind of a big part of our school year. And we absolutely need the technology for them in order for them to be able to pass that test. If they didn't have Chromebooks, they would not be able to be exposed to the format of the standardized test and learn how to do all the little different tricks and highlighting things and having something read to you, as well as just being able to navigate back and forth between a source and their answer.

Before we had Chromebooks, it was a little ridiculous. We would practice on paper and then they would go into this testing situation that was completely foreign to them. We've seen our test scores go up pretty dramatically from being able to show them practice tests and expose them to it.

Leaders indicated that they felt it was too early to tell whether there is a substantial difference in student achievement. One leader said, when asked whether technology use shows promise for improving student academic outcomes, “That’s my hope. I think it takes a couple years to really show.” Another participating leader agreed that they saw initial indicators of improvement, saying, “I would say yes. We've been using a MAP inventory, which is our MAP screener to gather data. We do it two times a year, up to three times. After the initial inventory, our student achievement specialist has really done a good job with the team to guide them through the data and adjust instruction using the data. There was a particular grade level team that really jumped up in scores. In fact, a lot of them did. They really used the questions from the MAP inventory and geared their instructions to that. And when we did the test again, their scores really went up. It was great.”

Do instructional practices show promise for improving student academic outcomes with at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards)?

Section Highlights:

While student achievement data will be incorporated in future DDSD reports, qualitative data from interviews with teachers and leaders, as well as from teacher surveys, described the promise that the use of technology is showing for students from at-risk subgroups. Participants emphasized the benefits of technology for facilitating teachers' abilities to meet individual student needs.

Teacher survey data and interviews with teachers and leaders indicated potential for instructional practice changes. Student achievement data will be available for future reports to determine whether measurable change is taking place. Across DDSD, leaders commented on efforts to support students from at-risk subgroups, who make up a large portion of students in the district. The district's technology integration coach described efforts surrounding Imagine Learning with ELL students and efforts specific to other at-risk subgroups, saying:

> *One of the things with this grant is Imagine Learning. We're doing that basically school-wide, and it's really geared towards English language learners. With Special Ed, being able to engage the kids more with a Smartboard and doing more practice on the Chromebooks. It's definitely engaged them. The achievement, it's still kind of early to tell there because we don't have the scores back yet.*

One portion of DDSD's TechSmart funding went to purchasing RedCat audio systems, which were mentioned often during interviews. One leader said, "We were able to purchase RedCat systems. The systems help for many reasons. Kids aren't able to hear or process information as well without the systems. It also helps because teachers don't have to impact their own health by constantly raising their voices just to be heard if classrooms are louder. It allows for kids to be heard as well." The leader went on to describe how the audio systems have not only impacted students' abilities to learn and teachers' abilities to teach, but also administrators' abilities to assess what is happening in classrooms. They said, "When I'm in a classroom assessing, now I hear everybody, not just the teacher and not just the kids who have louder voices. It helps me to assess their learning a lot better. It's kind of an equity issue. It empowers students to speak up who otherwise might not have."

During the year-end survey and interviews, teachers commented on the strategies they have used with at-risk subgroups. Table 6 lists teachers' comments from the year-end survey.

Table 6. Teachers' Use of Technology-Supported Instruction with At-Risk Subgroups

"Imagine Learning is used independently and at each learner's level. I pull groups based on need for small group instruction. Math talks and student strategies are discussed and demonstrated using the smartboard. Every child has an access point to these practices. LearnZillion, MobyMax, all writing assignments through Google Classroom (some ERC students have write assist technology). Research and slideshows are shared and worked on as groups electronically."
"Typing, speech to text, videos, audio books"
"Students used Imagine Learning, Moby Max in multiple subjects and Epic books."
"Using the smartboard has helped my class learn how to present to other students in a way that they have not been able to master before. My entire class receives special ed services, and all of them have communication goals, so being able to independently present information is a big deal!"
"I was able to get a RAZ kids subscription and level each student so they could go onto their account and immediately be reading books at their level on their individual Chromebooks."
"Have used Assistive Technology tools and referrals to bring additional tools into my classroom. I have a student that needed an iPad instead of a Chromebook. Using specific programs with the iPad, this student was able to communicate their learning needs and complete work in class."
"Assigning them reading activities at their level. Using it to show pictures and videos of things or concepts that ELL learners don't understand."
"Flipgrid to have students listen to themselves."
"Google Classroom to differentiate lessons and projects, videos and images for comprehensible input, language games that reiterate vocabulary and grammar, google docs, forms, and tables as templates for student output."

In interviews, teachers described the advantages they have seen so far to using technology with students from at-risk subgroups. One teacher said, "There are kids in the class who aren't up to speed with their writing or their reading, and the technology can help them in many ways. In reading programs, they can click on words to have them read and learn how to pronounce them. They can have books read to them. With writing, they can go into a Google Doc, and if they're really struggling with typing or writing in general, they can speak to have the text come out. I have a couple of students who have physical impairments, and this has been a total game changer, life changer for them. They absolutely hated writing, but now they can get their ideas out, and it's written down, and we can just jump over that hurdle very quickly and easily. It's kind of like magic sometimes to watch that happen."

The same teacher later said, "I teach to all the students, but when different things might come up due to factors at home, like if the parent at home doesn't read or speaks a completely different language at home, then the technology that we use can help them just adjust more quickly, working on their spelling and grammar and making games to make it more interesting."

Other teachers also referenced the differentiation that is made possible by technology. One teacher said, “Those students who, especially on IEP or with achievement needs have been able to access things from home. If they cannot do learning at the same level, I can assign specific lessons with content we have and they can go on the devices and do that work. It allows them something to be successful with. It's helped with especially one student that I've gotten recently that has some severe anger issues. It’s keeping him from escalating.”

Digital Age Learning Culture

Districts embrace a cultural shift and view technology as positive.

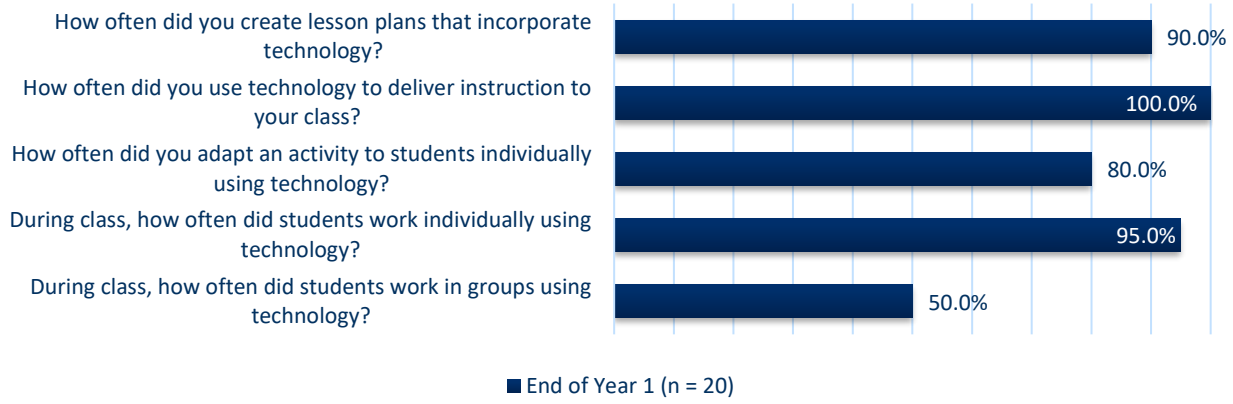
Has the use of technology to support instructional practices increased?

Section Highlights:

Teacher survey results showed that by the end of SY 18-19, 80-100% of teachers were moderately or frequently using technology in lesson plans, to deliver instruction, to adapt activities to students individually, and to conduct individual work. Half of teachers used technology moderately or frequently to conduct group work. The year-end status report emphasized several programs of particular success, including Flocabulary, Kami, and LearnZillion.

Figure 6 illustrates the frequency with which DDSD teachers integrated technology in five different ways at the end of SY 18-19. A total of 80 to 100 percent of teachers indicated they do each of the following "a moderate amount" or "a great deal": create lesson plans incorporating technology; use technology to deliver instruction; adapt activities to students individually using technology; and have students work individually using technology. One behavior occurred less frequently, as only half of teachers indicated they have students work in groups using technology "a moderate amount" or "a great deal."

Figure 6. David Douglas Frequency of Technology Integration
(% A Moderate Amount/A Great Deal)



The year-end status report also indicated several ways in which technology use to support instructional practices has increased. According to the report, two teachers piloted use of Flocabulary, prompting several other teachers to use a trial of the program. A program called Kami was used so successfully to push digital assignments to students that leaders enabled the program throughout the district. According to the report, over 2,500 teachers and students used Kami in SY 18-19. LearnZillion was also used as part of math adoptions, giving teachers the ability to push videos, assessments, and "exit tickets" to their students.

Is the learning management system useful for identifying effective instructional practices (more efficient, easier, data driven)?

Section Highlights:

While there is no formal learning management system in place for the district, DDSD uses data from several different tools and assessments to inform data-driven instruction, understand progress, and differentiate among students' needs.

Although DDSD has not implemented a learning management system (LMS), the district is utilizing several tools to collect data and inform data-driven instruction. The year-end status report lists the following tools and resources in use within the district: Math inventory as a math data collection tool; DIBELS assessment as a reading data collection tool; Smarter Balanced assessment data to guide instruction; and Imagine Learning data to differentiate instruction.

Do teachers have increased access to and use of digital content and resources?

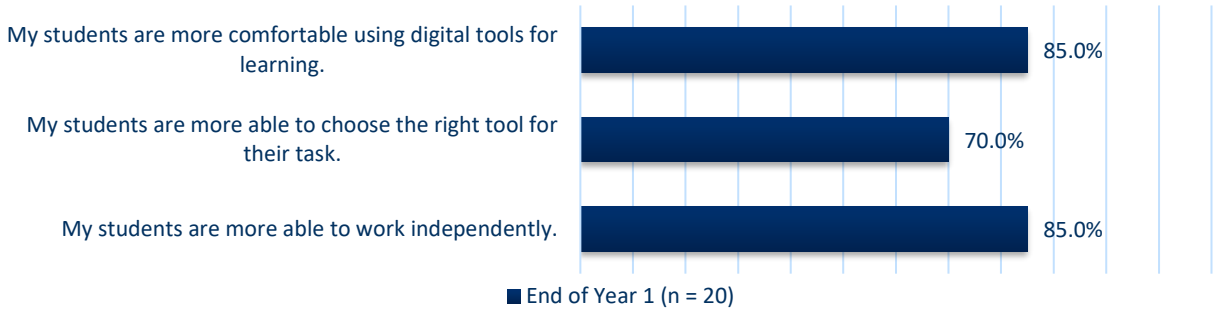
Section Highlights:

By the end of SY 18-19, 95% of teachers indicated that they use digital content and resources in instruction. A large portion of teachers (70 to 85%) also indicated that students have adequate access to technology in class, and that students are more comfortable and skilled with technology. Teachers also self-reported their skill levels with technology, and average ratings of skill level increased dramatically from fall 2018 to spring 2019.

David Douglas teachers provided reports of how often they use digital content and resources during instruction and the adequacy of students' access to technology resources in their classrooms. Data were provided during the spring teacher surveys. A total of 95% of teachers indicated they use digital content and resources in their instruction either "a moderate amount" or "a great deal," while 85% of teachers indicated that it is "true" or "very true" that students have adequate access to technology resources in their classrooms.

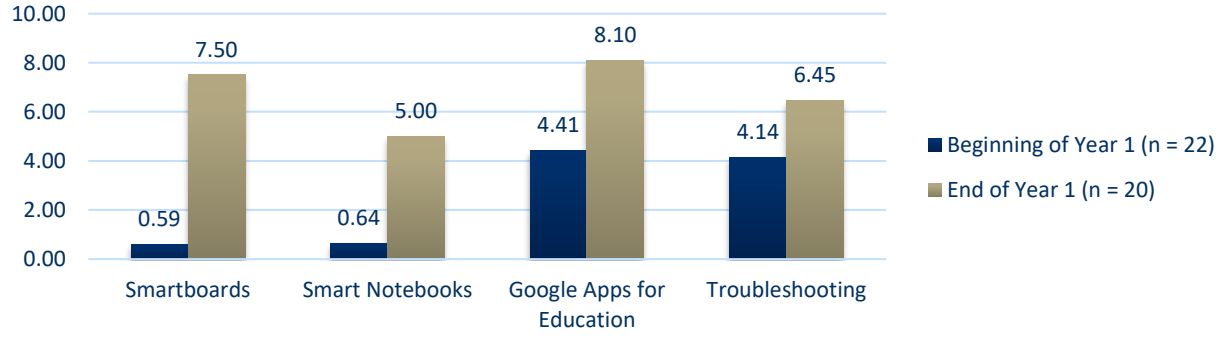
Additionally, teachers were asked to rate a series of statements comparing their current students to students from their previous year of teaching. As shown in Figure 7 below, 85% of teachers agreed or strongly agree that their students were more comfortable using digital tools for learning and more able to work independently at the end of SY 18-19 than previous years. Additionally, 70% of teachers agreed or strongly agreed that their students were more able to choose the right tool for their task.

Figure 7. David Douglas Year-End Student Technology
(% Agree/Strongly Agree)



Finally, teachers were asked to rate their skill level on a scale from 0 to 10 with a variety of forms of technology used in classrooms at DDSD: Smartboards, Smart Notebooks, Google Apps for Education, and troubleshooting technology. Responses were collected at the beginning and end of SY 18-19, and results are displayed in Figure 8. There were substantial increases in the average skill levels teachers self-reported from fall to spring in all four areas. The average skill level for Smartboards increased from 0.59 on a scale from 0 to 10 during the fall survey to 7.50 during the spring survey, representing the largest shift in average skill rating of any of the skills asked about. There was also a particularly large shift in reported skill level with Smart Notebooks, from 0.64 in fall to 5.00 in spring, and in reported skill level with Google Apps for Education, from 4.41 in fall to 8.10 in spring. The smallest change was in troubleshooting technology, which moved from an average reported skill level of 4.14 in fall to 6.45 in spring

Figure 8. David Douglas Teachers' Self-Reported Technology Skills



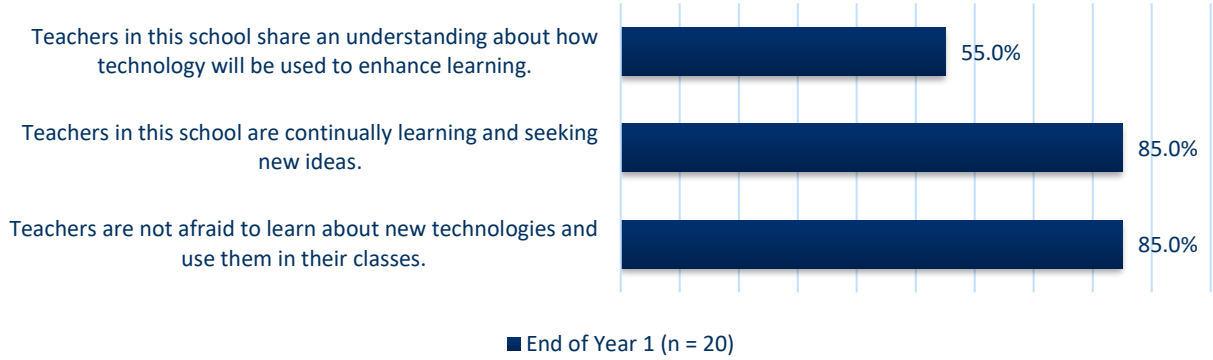
Is there evidence of district-wide support for technology integration?

Section Highlights:

At the end of SY 18-19, the majority of teachers agreed or strongly agreed with all statements regarding teacher culture of support for technology integration. Interview data also supported the finding that there is a culture of support for technology integration building at DDSD.

During the teacher survey, teachers were asked to rate their agreement with several statements regarding school culture of support for technology integration. Figure 9 displays results of teacher ratings from spring 2019. Over half of teachers agreed or strongly agreed (55%) that teachers share understanding about how technology will be used to enhance learning. A total of 85% of teachers agreed or strongly agreed that teachers are both continually learning and seeking new ideas, and not afraid to learn about new technologies and use them in class.

Figure 9. David Douglas Teacher Perceptions of a Culture of Support for Technology Integration
(% Agree/Strongly Agree)



In line with results of the teacher surveys, qualitative interview data supported the idea that DDSD is building a strong culture of support for technology. Interview participants emphasized the value of the technology integration coach for providing direct support and building culture within the participating schools. When asked if there is a culture of support around technology at their school, one teacher said:

I feel completely supported with any questions that I have. Our coach doesn't just answer questions, but he will send out an e-mail every month and say, "Here are some new ideas that you might want to try out in your classroom." If the programs that I'm using are getting a little tired or stagnant, I can look to that as an example and say, "Oh, we're going to try this new program out." I've tried several this year and worked my way into some level of mastery with those. The support is high, mainly because of our tech support person.

Leaders also emphasized the culture of support. One leader said, “Yes, there is a lot of support. As we've been able to get more technology into our school, teachers are taking more risks while embracing it.” Another leader said, “I feel like teachers are more and more trying to figure out how to embed technology purposefully, not just as another thing that kids can do while they work with a small group. We’re having a lot more conversations about how we can do that, and teachers are reaching out for suggestions from the technology coach. So I do feel like we’re really building a culture that is embracing that.”

Do parents have an increased understanding and utilization of districts' technology assets?

Section Highlights:

Parents and families are being engaged through some events (i.e., family night with a Smartboard activity; conferences with Smartboard focus). However, teachers described both successes and challenges with involving parents, particularly due to the diversity of families and of parents' abilities and limited access to resources.

Perhaps in part because increasing engagement with parents and families is one of DDSD's primary goals in TechSmart implementation, teachers frequently discussed how they are integrating more communication and involvement with parents and families. Several teachers mentioned incorporating technology into conferences between teachers and parents/families. One teacher described how use of technology transformed their conferences, saying:

> *I started with their math goals and recorded their fluency, and then I set up a Google slide with all of their data. At conferences, the kids shared their information on the Google slide on the Smartboard and they did their presentations for the parents. Any parents who had not been understanding what we've been doing with the grant were so impressed. They were like, "Wow! What is this? Are you kidding me? And you know how to run this? And you know how to do this?" It was a great way to publicize our work with technology. I had 99% attendance at conferences. It took a little more work to prep, but then during the conferences I wasn't doing the talking, the kids were doing it.*

Interview participants also discussed how increased technology integration seems to be impacting parents' choices outside of school. One teacher said, "Kids who weren't done with work, they could access it at home. It led to really good discussions with parents, like maybe instead of gaming you need to be working with a particular website or app. Kids are wanting to play games about math instead of just playing video games. It's created some amazing transitions for kids."

One teacher described how challenging parent involvement can be in their school, due to the diversity of families and their differing abilities and needs. They said, "You know, this is a hard one for Mill Park specifically. Our parent involvement is difficult due to the fact that we have so many immigrant families and low economic standing families, people without e-mails, people who do not speak a word of English. Parent contact and parent support is just something that this particular school has struggled with and will continue to struggle with. I have used Google Translate and stuff, but that can be pretty iffy, so that's not really up to speed yet. When I was student teaching at a school that was predominantly high economic standing, a predominantly white school, you have parents who are super involved and you create Google groups, and the parents can be involved with Google Classroom and all of that. We just don't really have that here."

Despite challenges, the district reported two parent events that integrated technology. At Menlo Park, the Smartboard was used for an activity at a family night event. Approximately 500 parents were estimated to attend this event, or to participate in conferences with teachers who used the Smartboard to conduct conferences, as described by one teacher above.

Visible Leadership

District leadership is actively involved and working with key communities to accomplish change.

Are districts identifying effective instructional practices and disseminating information and results to other districts?

Section Highlights:

The DDSD year-end status report and interviews with district leaders indicated that there are some limited efforts to interact with other districts, but it may be too early for widespread information sharing to have fully caught on. The district participated in the East County Technology Consortium and partnered with Imagine Learning to share their implementation with other districts.

The year-end status report indicated that DDSD participated in the East County Technology Consortium meetings, which occur monthly and cover implementation, coaching tips, reporting tips, and other related topics. The district also shared on the year-end status report that the Consortium was building a website that lists best practice strategies, questions, and a discussion board, which was anticipated to be complete by the end of SY 18-19.

In interviews, one leader mentioned an opportunity related to Imagine Learning, which was implemented in the participating schools. They said, "We actually have some people from Imagine Learning bringing a bunch of people from some different schools to see how we've implemented."

In another interview, a district student achievement specialist said, "We have an instructional coach meeting once per month, where I get together with the other people who have my same job at the other schools. I'll often be talking about things we're doing or able to do because of our technology, and I'll say, 'Oh that's right, you don't have that, but here's what it could help to do.' So I know there's a lot of interest elsewhere to get the same type of technology that we're using."

Do teachers feel increased support from district leaders regarding technology integration?

Section Highlights:

All teachers agreed or strongly agreed that administrators at their school are generally supportive of technology integration efforts, but interviews showed more complex perspectives. Teachers reported feeling very supported by the technology integration coach but hinted there was opportunity for other district leaders to provide additional support.

By the end of the first year of implementation, all 20 teachers who participated in the year-end survey agreed or strongly agreed that administrators at DDSD are generally supportive of technology integration efforts. During interviews, teachers and leaders were particularly vocal about the value of the technology integration coach, as emphasized in other sections above. When asked about support received from the district, one teacher said, "Our coach is amazing. We could not ask for a more knowledgeable person.

He's incredible at helping us with whatever we need, so that's been great. I think we would like to have more coaching time, only having one coach. If he was here full time, we'd use him full time."

Another teacher indicated that support could be increased from other sources outside of the technology integration coach, but that they feel supported in making their own choices about integration. When asked what support they receive from the district level, the teacher said, "Outside of our tech coach, I don't see a whole lot of support from the district level. It's a commonsense idea that the world is moving toward more and more technology, so it's important that kids learn at an earlier age how to use all of this stuff. It's not like people from the district have come and said, 'You need to be using more technology in the classroom.' That's kind of understood. There are times when I don't want to use technology, where it's like, 'Hey, there's too much screen time going on in our classroom. Let's close everything up for a little while.' And that's up to my discretion to decide."

Data-Driven Improvement

Current, relevant, and high-quality data from multiple sources are used to improve schools, instruction, professional development, and other systems.

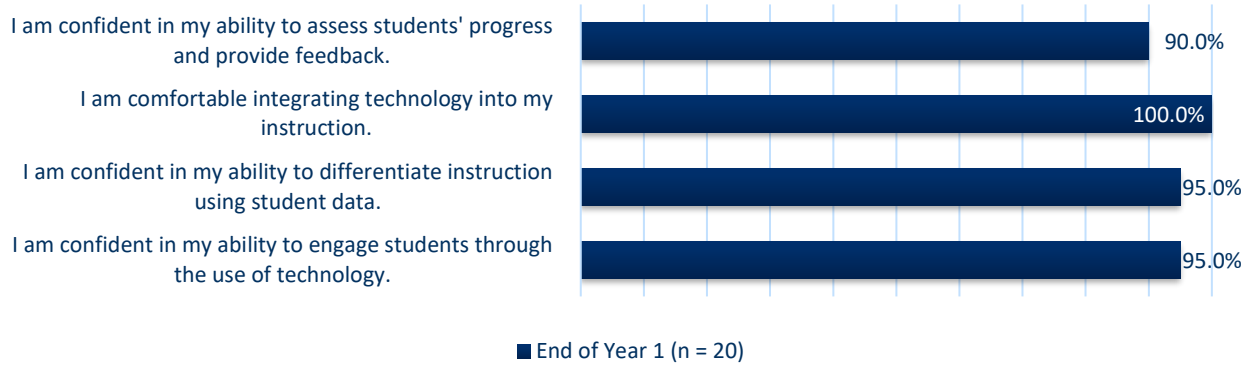
How are schools using data to improve instruction, professional development, and student performance?

Section Highlights:

Both surveys and interviews from SY 18-19 indicated that teachers are confident and comfortable using data to improve instruction. The majority of teachers agreed or strongly agreed with survey statements about their integration of data-driven instruction, and all interviewed teachers provided examples of use of formative assessments.

During the end-of-year survey, teachers provided agreement ratings for several statements about data-driven improvement. Results are shown in Figure 10. A total of 90% of teachers agreed or strongly agreed that they were confident in their ability to assess students' progress and provide feedback. All teachers (100%) agreed or strongly agreed that they were comfortable integrating technology into instruction. A total of 95% agreed or strongly agreed that they were confident in their abilities to both differentiate instruction using student data and engage students through use of technology.

Figure 10. David Douglas Data-Driven Improvement
(% Agree/Strongly Agree)



An additional survey question asked teachers to report the extent to which they are using formative assessments. A total of 90% of teachers indicated they use formative assessments to identify effective instructional practices "a moderate amount" or "a great deal." These results were echoed in interviews, as all three participating teachers provided examples of use of formative assessments in the classroom. One teacher said, "We do a math program called Zearn, which is standards-based and allows me to change lessons to fit the kid specifically and fit their needs. A formative assessment would go something like I would start the whole class on a specific lesson with Zearn, and either through walking around the class – or now the kids know they can just come to me and say, this is too easy or too hard – I can alter that really quickly. So it's not like taking summative assessments. It's like me walking around the class and saying, 'Oh, this book is not at their level. I'm going to change the reading level on the program.' Or they're not

really doing math at their level. I can go in and make it something they're able to do or that is challenging for them. That's pretty easy to do. It does take a little while for a school that had none of this stuff, but now I feel like I'm really good at it."

During one leader interview, a participant shared additional information about use of data to drive instruction, saying, "Both Zearn and Imagine Learning give them formative data back that they can then use to guide instruction. With Imagine Learning, they'll pull their data pretty much daily to decide who they need to pull into a small group to work on instruction and to see what they can do to get students who are struggling and give them the support they need."

Funding & Budget

District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.

Have districts identified at least one opportunity for repurposing resources to support technology integration?

Section Highlights:

DDSD leaders and the year-end status report described efforts to repurpose resources, such as purchasing additional equipment outside of the grant funding to scale benefits up to other schools and classrooms, but the extent to which these efforts involved true repurposing of resources was not yet clear.

Both the year-end status report and leader interviews provided evidence of resources that have been repurposed to support technology integration. In the year-end status report, several purchases were highlighted, though it was not clear whether funding was repurposed or came from existing technology budgets. These purchases included: new Chromebooks to replace those that did not support Imagine Learning in the three schools that were licensed Imagine Learning programs; ten touchscreen Chromebooks for every elementary school in the district to be used for ESL screeners; and iPad Pros for all district mentors. These purchases were cited as decisions made based on the success of technology use within Mill Park and Menlo Park schools.

In interviews, one leader shared additional examples of repurposed resources, saying:

I think we are looking at our staff differently, like looking at the people that have the strengths within our staff and using them to help, because one can't do everything. We have a couple of people who are pretty tech savvy. Then kind of using that passion for modeling or sharing. Also, we got so many devices per classroom. They're not all being used, so we're looking at using some of those touchscreen devices for some of our kids that maybe aren't in the special class but have some pretty significant needs. So just really looking at what do we have and how can we make that meet the needs of every child the best that we can, in the fairest and most equitable way. And the same with the RedCats. They aren't just good for third through fifth graders, they are really good for little kids too. All kids need to be able to have the equal access for speaking and hearing and processing.

Strategic Planning

District strategic plan reflects shared commitment to improving outcomes for students.

Does the district's strategic plan reflect shared commitment to improving outcomes for students?

Section Highlights:

District leaders described their own efforts to incorporate technology into their thinking and planning efforts and expressed hope that technology will be incorporated into strategic planning efforts at the district level.

District leaders described how they are working to incorporate technology into strategic plans. One principal said, "I would say we're all in a year of creating our continuing improvement plans and our school improvement plan. I'm sure that as we get a little more direction, technology is going to be a huge part in both plans, including the district guidance plan for overall and then our plans at each individual school level. We have to compete in the global society and that's the way of the future, so I know it will be in our school's plan, and I'm pretty positive that, as we create it, it will be in everybody's plan."

The district's technology integration coach described a hope for strategic planning that incorporates more widespread technology coaching within the district. They shared, "Teachers just don't have the training and they need it. Someone at the event a couple of weeks ago said that having a technology coach is not icing on the cake or a bonus or an extra. It's just pretty foundational."

Engaged Communities & Partners

Parents, stakeholders, community groups and others are actively and systemically involved in helping students develop, learn, and achieve.

Do district leaders demonstrate increased communication with and among outside stakeholders regarding technology integration?

Section Highlights:

Beyond efforts to involve parents, families, and technology coaches from other districts, no communication with other stakeholders was described in the year-end status report or interviews.

Throughout interviews and the year-end status report, it did not yet seem that DDSD has successfully integrated communication with and among stakeholders, with the exception of the efforts to communicate with parents, families, and other districts that are described in other sections of this report.

Evaluation Insights

The SY 18-19 evaluation at DDSD produced the following insights:

- The district's technology integration coach was consistently emphasized as a critical—perhaps even the most critical—contributor to DDSD's success thus far in implementing TechSmart within Mill Park and Menlo Park schools. Teachers explained the coach's valuable role in their PD and their ability to support their students. Leaders mentioned the coach's importance to the success of the program thus far. Qualitative findings about the coach's importance were supported by quantitative data from teacher surveys. All teachers rated individualized PD as "very" or "extremely" useful.
- Teachers seem engaged in transforming their instruction using the technology involved with implementing TechSmart. Many interview participants referenced how teachers are not only replacing activities or adding activities that involve technology, but using the technology to drive instruction through the ability to differentiate among students' needs and support student achievement. On the teacher survey and leadership rubric, teachers and leaders agreed that the most frequently uses of technology in classrooms were to help with planning and preparation and engage students in learning.
- Teachers reported substantially higher average skill levels with technology broadly, as well as with specific tools (e.g., Smartboards, Google Apps for Education) from the beginning to end of SY 18-19. Teachers also reported substantially higher comfort levels with technology.
- While many teachers and leaders felt it was too early to tell whether student achievement outcomes have been impacted, they all indicated that they see promise and potential for improvement based on those indicators that are already present in the classroom. Student achievement data were not available to a sufficient extent to warrant inclusion in the current report, but future reports will include the data as grant implementation and evaluation progress.
- DDSD teachers seemed particularly engaged in providing instruction that benefits and targets to those students from at-risk subgroups. Many participants described use of the RedCat audio systems to support equity in access to learning, and even described unexpected benefits, such as administrators' improved ability to assess classroom activities based on better ability to hear and understand what is taking place in classrooms that use the RedCat systems. Other participants discussed how Chromebooks, Smartboards, and other devices have increased their ability to differentiate learning and provide activities that satisfy and challenge a wide variety of levels of student ability.
- Culture seems to be generally positive regarding support for instructional practices that integrate technology. The majority of teachers indicated that they share understanding about how to use technology, seek out new ideas, and are not afraid to learn about and use new technologies. The technology integration coach was emphasized as important to building the culture of support.
- Involvement of and communication with stakeholders, including parents, remains an opportunity for continued growth and development within DDSD. Teachers described difficulties connecting with and involving parents and families, in part due to the diversity of students' families (e.g., low economic resources, non-English speakers).

Project Summary

Reynolds School District's (RSD) MHCRC TechSmart grant focuses on improving student achievement in 8th grade math, 9th grade credit attainment, and English learners' progress. RSD chose to focus on these outcomes because in the 2013–14 school year 44% of its students were English language learners, less than half of students completing their first year of high school were on track to graduate (earning six or more credits), and math was the course most frequently failed. RSD is using the TechSmart grant for middle and high school math classroom technology and related teacher professional development (PD).

District administrators implemented a staggered-rollout strategy where they onboarded a cohort of math teachers every school year for the first three years of the grant, so that by Year 4 (SY 18-19) the district had full implementation of technology-rich math curriculum across all middle schools and 9th grade students at the high school. In addition, RSD's grant helps fund technology for the Project Lead the Way curriculum, a STEM-based, nationwide education program being offered to 7th through 9th grade students as an elective course to increase student engagement in math and science.

RSD completed its fourth year of project implementation in School Year 18-19 (SY 18-19). No new cohorts were added during the fourth year, as focus shifted to sustainability efforts and continuing to build on previous successes. However, due to availability of longitudinal Cohort 3 data, this report is the first to fully include all three cohorts from RSD, breaking down reporting for Cohort 1, Cohort 2, and Cohort 3 teachers where relevant. Math teachers received teacher and student technology devices including Microsoft Surface Pros (teachers), short throw projectors, Dell Venues (students), and 3D printers. PD efforts focus on "lab cycles" and access to coaches, including an IT coach and a secondary math coach.

Methods

A general description of the methods included in the TechSmart evaluation are included in the introduction to the full report. Data collection efforts for the SY 17-18 evaluation in RSD are summarized below.

Teacher Survey

PRE designed a survey that was administered online to teachers twice during SY 18-19, in September of 2018 and May of 2019. The IT TOSA administered the surveys. A total of 31 teachers (10 Cohort 1, 13 Cohort 2, and 8 Cohort 3) completed the baseline survey, while 25 teachers (10 Cohort 1, 9 Cohort 2, and 6 Cohort 3) completed the year-end survey.

Teacher Interviews

PRE conducted phone interviews with six teachers involved in the TechSmart grant in Reynolds School District. Three of these teachers were part of Cohort 1 and in their fourth year of implementation, one was part of Cohort 2 and in their third year of implementation, and two were in Cohort 3 and in their second year of implementation.

District Leader Interviews

PRE conducted interviews in spring 2019 with four leaders including the Director of Secondary Education, the Project Lead, the IT TOSA, and the Reynolds Middle School Principal.

Student Surveys

Staff members administered the student survey online in May 2019. The survey was distributed to students who were participating in classes taught by one of the teachers in the TechSmart math cohorts, and 968 students completed it. Table 1 shows the grade levels of students who completed the survey. Three students completed the survey but chose not to indicate which grade level they belong to and are thus missing from the table below.

Table 1. Reynolds Student Survey Responses

Grade	n	% of total responses
6th	104	10.8%
7th	310	32.1%
8th	217	22.5%
9th	156	16.2%
10th	55	5.7%
11th	82	8.5%
12th	41	4.2%

Leadership Rubric

The leadership rubric was completed by one principal in Reynolds School District.

Reynolds Walk-Through Tool

RSD developed a district specific walk-through tool for the evaluation of their TechSmart grant and shared this data with PRE for inclusion in the SY 18-19 report. District administrators completed 13 observations for Cohort 1 teachers, 14 observations for Cohort 2 teachers, and 12 observations for Cohort 3 teachers. A copy of this tool can be found in Appendix G.

Student Achievement Data

In order to examine the impact of the TechSmart grant investment in Reynolds School District, comparative analyses were conducted using a historical comparison group. A concurrent comparison group was not created for Reynolds because over the course of the grant, students may move in and out of TechSmart teacher classrooms. The treatment cohorts are made up 6th grade student cohorts who had TechSmart math teachers during SY 15-16 (Cohort 1), SY 16-17 (Cohort 2), and SY 17-18 (Cohort 3). The historical Comparison Group is made up of those students who were RSD 6th graders during the 2012-13 school year and was selected because the student information system at RSD changed for 2012-13. Data are not available for the 2011-12 school year, as 2012-13 was the earliest available group; the result is thus that the Comparison Group overlapped by one year with grant implementation. The table below presents the number of students in the treatment groups (Cohort 1, Cohort 2, and Cohort 3) and the historical Comparison Group by year. Data were available for Cohort 1 students for their 6th, 7th, 8th, and 9th grade years. Data were available for Cohort 2 students for their 6th, 7th, and 8th grade years. Data were available for Cohort 3 students for the 6th and 7th grade years.

Table 2. Treatment and Historical Comparison Group Sample Size

Cohort 1		Cohort 2		Cohort 3		Historical Comparison Group	
Year	N	Year	N	Year	N	Year	N
2015-16 (6th)	163	2016-17 (6th)	628	2017-18 (6th)	554	2012-13 (6th)	754
2016-17 (7th)	149	2017-18 (7th)	552	2018-19 (7th)	521	2013-14 (7th)	754
2017-18 (8th)	125	2018-19 (8th)	481	--	--	2014-15 (8th)	666
2018-19 (9th)	104	--	--	--	--	2015-16 (9th)	465

Figure 1 below presents the at-risk indicators for the Treatment and historical Comparison Groups of students at RSD. The majority of all students in each cohort and the Comparison Group are students of color. Nearly half of students from Cohort 3 (48.7%) have limited English proficiency (LEP); other cohorts also have substantial LEP populations ranging from 20.6% to 37.8%. Cohort 1 has the lowest proportion of Special Education students (8.4%), while the Comparison Group has the highest proportion (18.4%).

Figure 1. Reynolds At-Risk Indicators

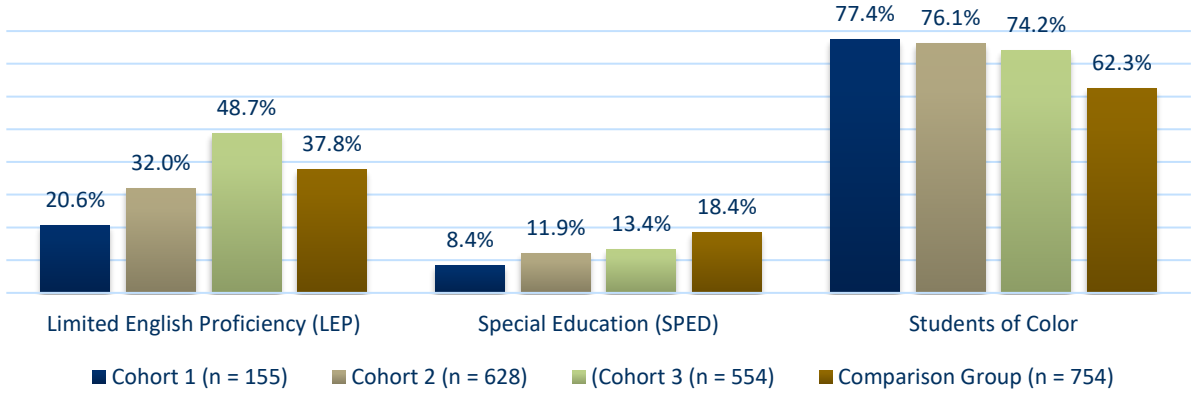
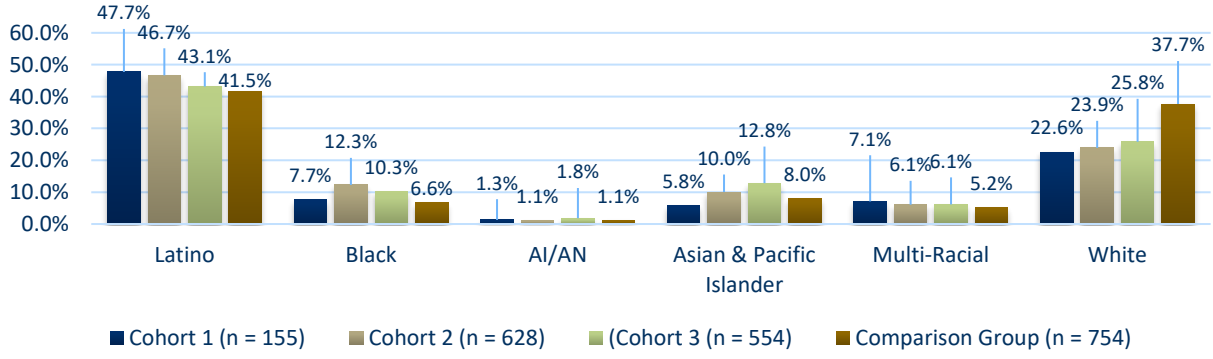


Figure 2 below provides a summary of the breakdown of student race/ethnicity in all three treatment groups (Cohort 1, Cohort 2, and Cohort 3) and the historical Comparison Group. The largest proportion of students in each group is Latino.

Figure 2. Reynolds School District Race/Ethnicity



Findings

The evaluation findings from the SY 18-19 evaluation at Reynolds School District are presented below and organized by the seven factors identified as essential for schools to effectively transform into technology-rich teaching and learning environments.

Teaching Effectiveness

Districts support regular, inclusive and shared professional development among teachers.

During SY 18-19, which represents RSD's fourth year of TechSmart implementation, the district continued with offering both group and individualized PD opportunities, centered on lab cycles and one-on-one meetings with the district's IT TOSA. Because no new cohorts were added during SY 18-19, some changes to the PD structure took place. The primary change reported in the district's year-end status report was the discontinuation of monthly late start meetings, which were previously conducted to lend support to new participants.

Lab cycles, which have been the primary form of group PD for RSD's TechSmart project, were continued during SY 18-19 but changed in composition. Because no new participants were added in SY 18-19, the year-end status report indicates that teachers chose to organize lab cycle groups according to grade level instead of according to cohort. Groups included: 6th grade teachers from all three participating middle schools; 7th and 8th grade teachers from all three participating middle schools; and high school teachers. All lab cycle groups launched in December 2018 for SY 18-19 and are facilitated by instructional coaches assigned to each middle school, as well as teacher leaders who serve the high school teacher group, according to the year-end status report. During the classroom portion of lab cycles, teachers led instruction for students who are not their own while observing teachers completed an analysis that focused on type, frequency, and depth of student dialogue. Following the lesson, the lab cycle groups reconvened to compare analyses and plan lessons together that take advantage of students' strengths and help fill gaps. During interviews, one leader described the PD that has taken place during TechSmart, saying:

With our grant, we've had two different forms of professional development we've offered and supported teachers with. One is just around the tech itself and how to use the tech and different tools and being efficient with it. I think that has been very important for staff to be comfortable with the devices and knowing how to use the devices to interact with students.

The other piece that we implemented was what we call lab cycles which are opportunities for staff to come together and collaborate around lesson planning and then go and coteach that lesson while other staff members are observing students. Teachers then come back and debrief the lesson itself, the strategies that were put in

place to help support students, and the effectiveness of the lesson, and that's been very, very beneficial.

In interviews, teachers cited lab cycles as the only group PD received during SY 18-19, and several teachers indicated it was the only PD of any kind received during SY 18-19. One teacher said, "We've done two lab cycles and that's pretty much it." The same teacher indicated they enjoyed the teacher-led approach to the lab cycles and described the benefit of having other teachers lead, saying, "They understand the value of our time and they understand what is useful because they're part of it as well. They're not just saying what they think we should feel is useful."

Teachers also indicated during interviews that lab cycles allowed each group of teachers to decide how much technology was used in lessons. One teacher said, "Our first lesson didn't incorporate the technology, but the second lesson did. And it was really appropriate, and it was great. Being able to be with teachers and spend a full day collaborating and looking and partaking in the lesson was really great. They're focused on our mathematics teaching using technology when it's appropriate. We think of mathematics and we think of incorporating technology into the mathematics. We use the technology as we planned, but the kids didn't use technology every time." Another teacher said:

Basically, the lab cycle is we would all get together from three different schools, so maybe a dozen of us at most. We would plan one lesson for one day, and it's up to the teachers in the group as to how much technology we would use. Sometimes the facilitators would provide some samples or some examples of how we could use technology during a lesson and would frontload that at the beginning. Then, during the planning stage it's really up to the teachers to decide how much technology we wanted to use. And so sometimes we would use technology during that lesson, but other times the majority of the teachers said, "No, we don't want to use technology today."

Individualized PD for SY 18-19 focused on opportunities for one-on-one meetings with the IT TOSA, who publishes a regular calendar for when he will be at each school building weekly. According to the year-end report, teachers are able to schedule sessions with the IT TOSA on the calendar. Meetings are thus scheduled according to teachers' needs. When asked during interviews if teachers engaged in individualized PD this year, several teachers indicated they have not received any individualized PD. Other teachers indicated some use of individualized PD opportunities, but use seemed limited, at least for those teachers who participated in interviews. When asked if they had met with the IT TOSA, one teacher said, "Yeah. Mostly just to troubleshoot any problems that I have, like any physical or software issues. He's an expert at Schoology. I have his contact on my phone. I don't really talk to him about instructional stuff. It's for the stuff I do behind the scenes—things I do to make sure things are running."

Table 3 and Table 4 summarize the amount of group and individual PD that teachers in each cohort received by the end of the school year. Table 3 shows that only one teacher (Cohort 1) reported receiving

0 hours of group PD during SY 18-19. All other teachers reported receiving 1-8 hours of group PD, and at least half of all teachers across all three cohorts received 17 or more hours of group PD.

Table 3. Reynolds School District Hours of Group PD

Hours of Group PD	Cohort 1 (n = 10) End of Year Survey	Cohort 2 (n = 9) End of Year Survey	Cohort 3 (n = 6) End of Year Survey
0 hours	10.0%	0.0%	0.0%
1-8 hours	10.0%	11.1%	16.7%
9-16 hours	20.0%	11.1%	33.3%
17-32 hours	50.0%	55.6%	50.0%
33+ hours	10.0%	22.2%	0.0%

Table 4 shows that the majority of teachers across all three cohorts received at least 1-8 hours of individualized PD in SY 18-19. No teachers received more than 16 hours of individualized PD. A total of 40.0% of Cohort 1, 11.1% of Cohort 2, and 16.7% of Cohort 3 received 0 hours of individualized PD.

Table 4. Reynolds School District Hours of Individualized PD

Hours of Individualized PD	Cohort 1 (n = 10) End of Year Survey	Cohort 2 (n = 9) End of Year Survey	Cohort 3 (n = 6) End of Year Survey
0 hours	40.0%	11.1%	16.7%
1-8 hours	50.0%	55.6%	83.3%
9-16 hours	10.0%	22.2%	0.0%
17-32 hours	0.0%	0.0%	0.0%
33+ hours	0.0%	0.0%	0.0%

Teachers rated the usefulness of the group and individual PD at RSD, as illustrated by Figure 3 (Cohort 1), Figure 4 (Cohort 2), and Figure 5 (Cohort 3). Across all groups, individualized PD was generally rated higher than group PD. More specifically, Figure 3 shows that the majority of teachers in Cohort 1 (55.6%) rated group PD as "slightly useful." The majority of teachers in Cohort 1 rated individualized PD as "moderately useful" (33.3%) or "very useful" (33.3%). No teachers rated either type of PD as "not at all useful."

Figure 3. Reynolds Teachers' Ratings of PD Usefulness - Cohort 1

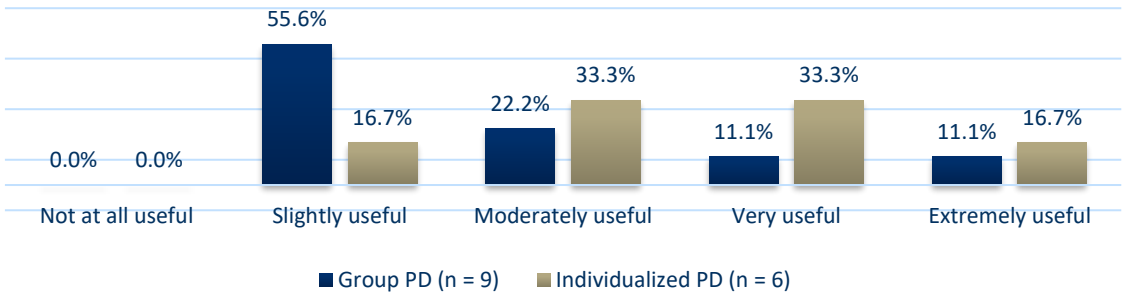


Figure 4 shows that the majority of Cohort 2 teachers rated group PD as "very useful" (37.5%) or "extremely useful" (37.5%). For individualized PD, the largest proportion of teachers (42.9%) selected "extremely useful." No teachers rated either type of PD as "not at all useful."

Figure 4. Reynolds Teachers' Ratings of PD Usefulness - Cohort 2

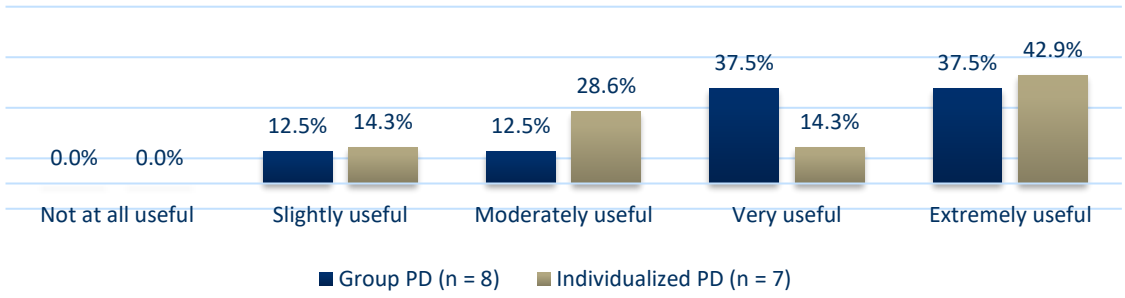
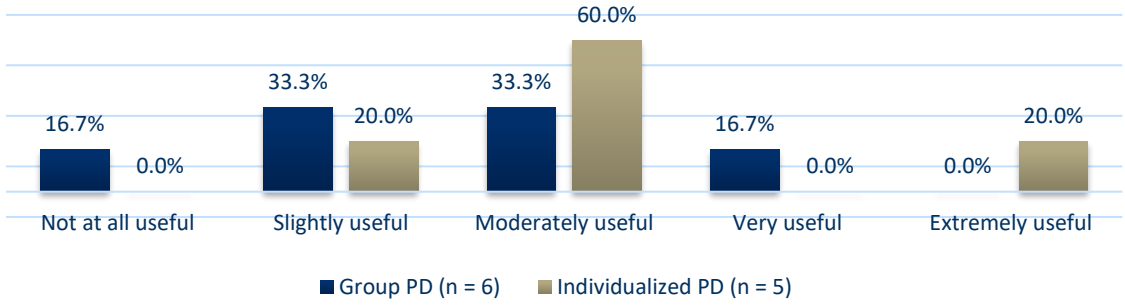


Figure 5 shows that the majority of Cohort 3 teachers rated group PD as "slightly useful" (33.3%) or "moderately useful" (33.3%). No teachers rated group PD as "extremely useful," and one teacher rated group PD as "not at all useful," which differed from both of the other cohorts. When Cohort 3 teachers rated individualized PD, on the other hand, results mirrored other cohorts somewhat more closely, with 60.0% of teachers selecting "moderately useful," 20.0% of teachers selecting "extremely useful," and no teachers selecting "not at all useful."

Figure 5. Reynolds Teachers' Ratings of PD Usefulness - Cohort 3



How is the professional development impacting teacher instruction?

Section Highlights:

This evaluation question includes the following outcomes: 1) PD has helped teachers increase the use of technology for evidence-based instructional practices, 2) PD has helped teachers use technology to analyze and use data about student learning, and 3) PD has helped teachers use technology to differentiate instruction. Qualitative responses indicated mixed effectiveness of PD, with Cohort 2 teachers showing the most substantial evidence of satisfaction with PD and its effectiveness. Quantitative results from teacher surveys showed that the majority of teachers from Cohort 1 and Cohort 2 are using technology for evidence-based instruction and differentiation. The majority of teachers from all three cohorts are using technology to analyze data about student learning. All teachers from all cohorts rated their technology skill levels as Level 3 or higher on a scale ranging from Level 1 to Level 5.

The teacher survey asked how effective the PD model has been in impacting teacher instruction. Table 5 displays a range of example responses from Cohort 1 teachers. In general, responses to PD were mixed,

with many teachers suggesting ideas for improvement. Some other teachers were satisfied with PD and its effectiveness.

Table 5. Effectiveness of the PD Model at Reynolds - Cohort 1

"I have tried many of the strategies that we learned/practiced during lab cycles. I suggest that professional development have more options for people to choose the PD that suits their needs. Many participants were turned off by the lab cycle format in general."
"It was good overall, and showed how to integrate instead of focus on the technology."
"We did not follow the grant. It has been disappointing. Our professional development via this grant rarely used tech."
"This professional development has been by far the most helpful in my 27 year experience as a teacher. Indeed, my teaching has been revitalized with innovation in order to meet the needs of the 21st century learner."
"More time devoted to teaching teams regarding a specific class."

A range of sample responses from Cohort 2 teachers is displayed in Table 6. Responses were generally positive, with several teachers indicating that working with other teachers in groups was particularly helpful.

Table 6. Effectiveness of the PD Model at Reynolds - Cohort 2

"It has been beneficial for the students to have easy access to the technology available. I wish that each year had a focus for a specific use so that it wasn't all so overwhelming."
"I have used more tech resources this year than any year prior, and by extension so have my students. I would say it has been very useful having a sharing community of teachers."
"It has been great to work with other teachers to learn and try new things in the classroom."
"Very effective. I like that we can get together and plan lessons that use technology. I'm much more likely to create similar lessons by myself if I've done it before with the group."
"It was very effective in helping me change instruction the first year. Every year has been about trying something new, but in the first year - everything was new!"
"I have transitioned from a fear of technology to implementing technology in my classroom almost daily. Having a technology problem solving session would be very useful. Where we could bring our list of ongoing issues and brainstorm solutions."

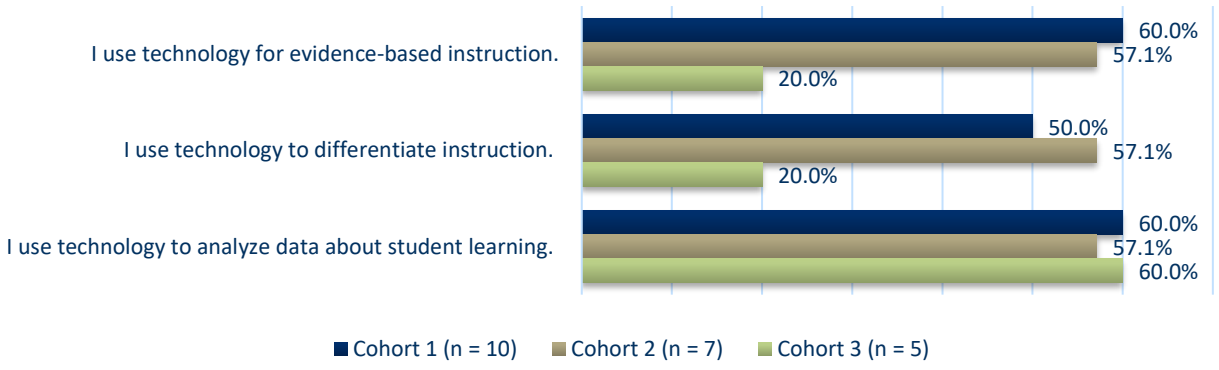
Table 7 displays responses from Cohort 3 teachers. Responses from Cohort 3 teachers were less positive, with multiple teachers indicating that their primary barrier was in the time commitment necessary to create lessons and implement changes to instruction.

Table 7. Effectiveness of the PD Model at Reynolds - Cohort 3

"Having a group of 8 take several hours to create a lesson is not anything like our typically lesson planning schedule, so I find it difficult to replicate things we do as a group in my own classroom. It opens my eyes to some new ideas, but I rarely find time to implement those ideas."
"It is great when I plan with others. I haven't done much on my own because it takes so much time on the front end to create and/or find activities to use the technology with. I have made nearly all of my instruction available online for students, but don't really do activities in class that require the use of technology. For me it is a TIME issue. I don't carve out the time needed to change my instruction."
"It hasn't helped in changing my instruction. It forces me to change my instruction. This grant isn't something anyone in our school wanted/wants."

The survey asked teachers to describe the extent to which PD increased their use of technology for evidence-based instruction, differentiating instruction, and analyzing and using data about student learning. Results are presented in Figure 6. A total of 50-60% of teachers indicated they use technology in each of the three ways at least "a moderate amount" across all three cohorts, with the exception of Cohort 3 teachers' more limited uses of technology for evidence-based instruction and to differentiate instruction. Cohort 1 responses were relatively similar to the previous year (SY 17-18), with most percentages in SY 18-19 falling within 5-10 percentage points of SY 17-18 responses. Cohort 2 responses indicated less frequent use of technology for all three purposes (i.e., evidence-based instruction, differentiation, and analysis of data about student learning) in SY 18-19 than the end of the previous year.

Figure 6. Reynolds Instructional Technology Use
(% A Moderate Amount/A Great Deal)



Teachers also reported their technology skill level on surveys by rating themselves at one of the following five levels:

Level 1: I get someone else to do technology-based tasks for me.

Level 2: I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job.

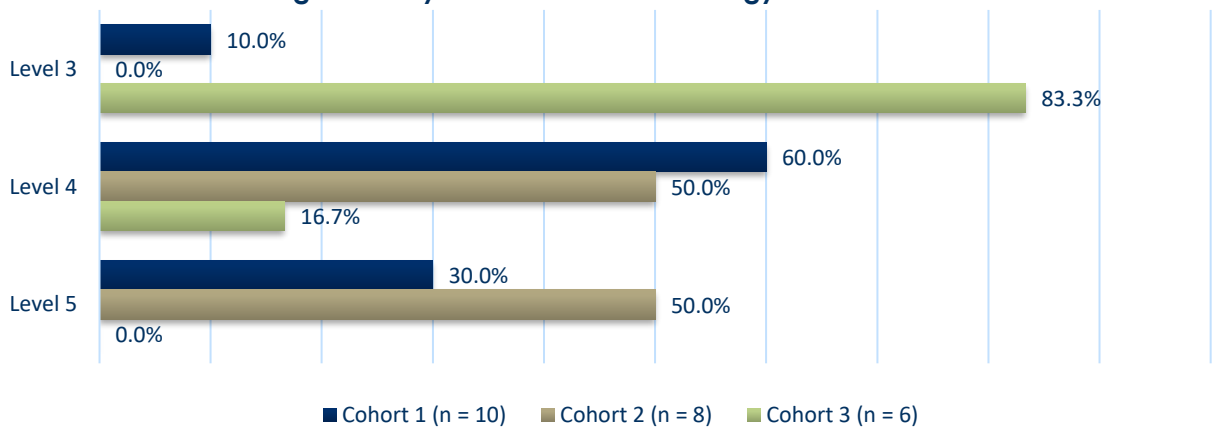
Level 3: I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose.

Level 4: I use a variety of technology tools and I use them efficiently for all aspects of my job.

Level 5: I use technology efficiently, effectively, and in creative ways to accomplish my job.

Figure 7 displays results for all three cohorts at the end of SY 18-19. No teachers from any of the three cohorts rated themselves as Level 1 or Level 2. By the end of their fourth year of implementation, 90.0% of Cohort 1 teachers rated themselves as Level 4 or 5. Of Cohort 2 teachers, 100% rated themselves as Level 4 or 5. Results for both Cohort 1 and Cohort 2 teachers represented substantially higher ratings than the end of the previous year (SY 17-18). For Cohort 3, nearly all teachers (83.3%, or 5 out of 6 teachers) rated themselves as Level 3. One teacher (16.7%) rated themselves as Level 4.

Figure 7. Reynolds Teacher Technology Skill Levels



What new instructional strategies are teachers reporting?

Section Highlights:

During their fourth year of implementation, RSD teachers reported using a variety of instructional supports and digital tools in the classrooms. Use of technology was confirmed by walk-through observations. Teachers most frequently reported using technology to differentiate instruction, and gave use of technology for differentiation effectiveness ratings that ranged from an average of 4.00 in Cohort 1 to an average of 4.50 in Cohort 3. In all three cohort, teachers frequently reported use of technology for engaging students in learning and for planning and preparation. During walk-throughs, the most commonly reported tool was student computers, with 100.0% of observations reporting evidence of student use in Cohort 1 and Cohort 3 classrooms and 85.7% of observations reporting evidence in Cohort 2 classrooms.

Teachers were asked to provide examples of instructional strategies that they believed had been effective in their classroom instruction and rate the strategies on a scale of one to five, with five being the most effective. Responses from Cohort 1 teachers are displayed in Table 8. Cohort 1 teachers most frequently reported using technology to differentiate instruction and to utilize Schoology, and teachers rated both as an average of 4.00 out of 5 for effectiveness.

Table 8. How New Technology is Being Used for Instruction – Cohort 1

Instructional Supports	Effectiveness Rating End of Year
Differentiating Instruction	**4.00** (n = 3)
Schoology	**4.00** (n = 3)
Kahoot	**4.50** (n = 2)
Desmos	**4.50** (n = 2)
Content Review and Reinforcement	**3.50** (n = 2)
Creating Assessments	**3.00** (n = 2)
Microsoft Products (e.g., Excel, Powerpoint)	**3.00** (n = 2)
Preparation for State Testing	**5.00** (n = 1)
Classcraft.com	**4.00** (n = 1)
Data Analysis	**3.00** (n = 1)
Self-Paced Work	**3.00** (n = 1)
Small Group Discussions and Activities	**3.00** (n = 1)
Quizlet	**3.00** (n = 1)

Table 9 displays instructional strategies from Cohort 2 teachers. Cohort 2 teachers most commonly reported using technology to differentiate instruction and rated its effectiveness as 4.33 out of 5, which represents an even higher rating than Cohort 1 teachers gave for using technology to differentiate instruction.

Table 9. How New Technology is Being Used for Instruction – Cohort 2

Instructional Supports	Effectiveness Rating End of Year
Differentiating Instruction	**4.33** (n = 3)
Distributing Materials and Notes	**4.50** (n = 2)
Desmos	**5.00** (n = 1)
Small Group Discussions and Activities	**4.00** (n = 1)
Self-Paced Work	**2.00** (n = 1)

Table 10 displays example instructional strategies that Cohort 3 teachers found particularly effective. Cohort three teachers answered this question by listing tools or activities rather than instructional strategies. Two teachers mentioned use of Microsoft products, such as Excel or Powerpoint, and provided an average effectiveness rating of 4.50 for use of these products.

Table 10. How New Technology is Being Used for Instruction – Cohort 3

Instructional Supports	Effectiveness Rating End of Year
Microsoft Products (e.g., Excel, Powerpoint)	**4.50** (n = 2)
Student Projects	**5.00** (n = 1)
Desmos	**5.00** (n = 1)
Small Group Discussions and Activities	**4.00** (n = 1)
IXL	**4.00** (n = 1)
Schoology	**3.00** (n = 1)
Hands-on Activities	**3.00** (n = 1)

Teachers were asked to self-assess their use of technology to support instruction using a rubric on the year-end survey. Relevant leaders (principals and the IT TOSA) were asked to complete the same rubric "thinking about their TechSmart teachers as a whole" following their leadership interview in the spring. The leadership rubric was completed by one principal in RSD. Table 11 presents results from all three cohorts of teachers, as well as the principal who participated. In all three cohorts, teachers gave the highest ratings to use of technology for engaging students in learning and for planning and preparation. Use of technology for assessments and for demonstrating flexibility and responsiveness were also rated highly by Cohort 1 and Cohort 2 teachers. In general Cohort 3 provided the lowest ratings of any of the three cohorts, perhaps due to less time spent integrating technology into instructional practices due to their later cohort start date. The principal who participated rated teachers highly on all uses of technology, but slightly lower on use of technology for communicating with students.

Table 11. Technology Used for Supporting Instructional Practices
(1 = Not At All, 2 = Very Little, 3 = Somewhat, 4 = To a Great Extent)

	Teacher Survey: Cohort 1 (n = 8)	Teacher Survey: Cohort 2 (n = 7)	Teacher Survey: Cohort 3 (n = 6)	Leadership Rubric Survey (n = 1)
Planning and Preparation	3.71	3.43	3.17	4.00
Managing Classroom Procedures	3.00	3.14	2.50	4.00
Organizing Physical Space	3.00	2.71	2.67	4.00
Communicating with Students	2.86	3.14	2.83	3.00
Using Questioning and Discussion Techniques	2.71	2.43	2.17	4.00
Engaging Students in Learning	3.57	3.43	3.50	4.00
Using Assessment in Instruction	3.43	3.14	2.67	4.00
Demonstrating Flexibility and Responsiveness	3.14	3.14	2.50	4.00

In the leadership rubric, the principal provided specific examples of how teachers are using technology to support new instructional practices in these areas. One example provided was:

We provide specific and immediate feedback to students on their work, based on the teacher's capacity to do so digitally. Additionally, most lessons are posted in Schoology, so students are able to access content whether they attend school or not.

Similarly to previous years, leadership also commented on how teachers have used technology to support instruction for at-risk subgroups (i.e., students of color, ELL, SPED, and low SES) in these areas of instruction. The participating principal explained:

Generally, differentiation in terms of skill building is provided to a much greater degree via software programs such as Kahn Academy and Moby Max.

In our interviews, teachers shared the ways they are integrating new instructional strategies into their classroom using technology. While some teachers reported they have struggled to incorporate technology in meaningful ways, others reported much more success. One teacher explained how technology has allowed them to transform the way that they interact with the class, sharing:

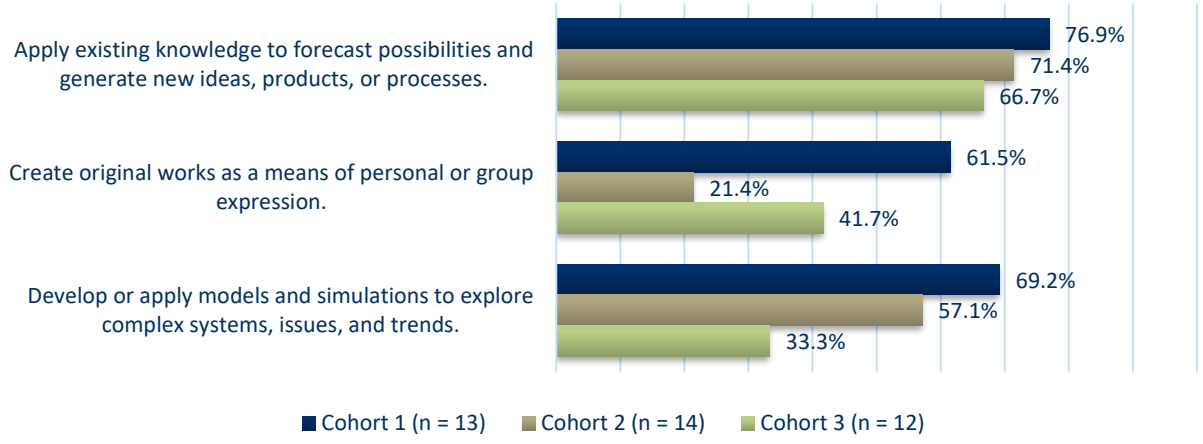
I think the biggest difference is me being able to walk around, use the tablet, and talk to kids. It's not necessarily new, although it is new that I get to be more visible and more present, instead of just being a direct instructor in the front of the class. I can sit down and project from wherever I am, and I feel like I'm a little more part of the group, part of being a mathematician with my students instead of being the overall teacher. I feel like that's helped me incorporate being a learner with them. So, that's definitely something that is new in the last two years. That's been super effective.

Reynolds Walk-Through Data

Content from the RSD walk-through tool that is relevant to this evaluation is presented below by cohort. Observers were asked to mark all that apply when conducting the observation and if none of the items were observed during a classroom visit, they marked "not observed".

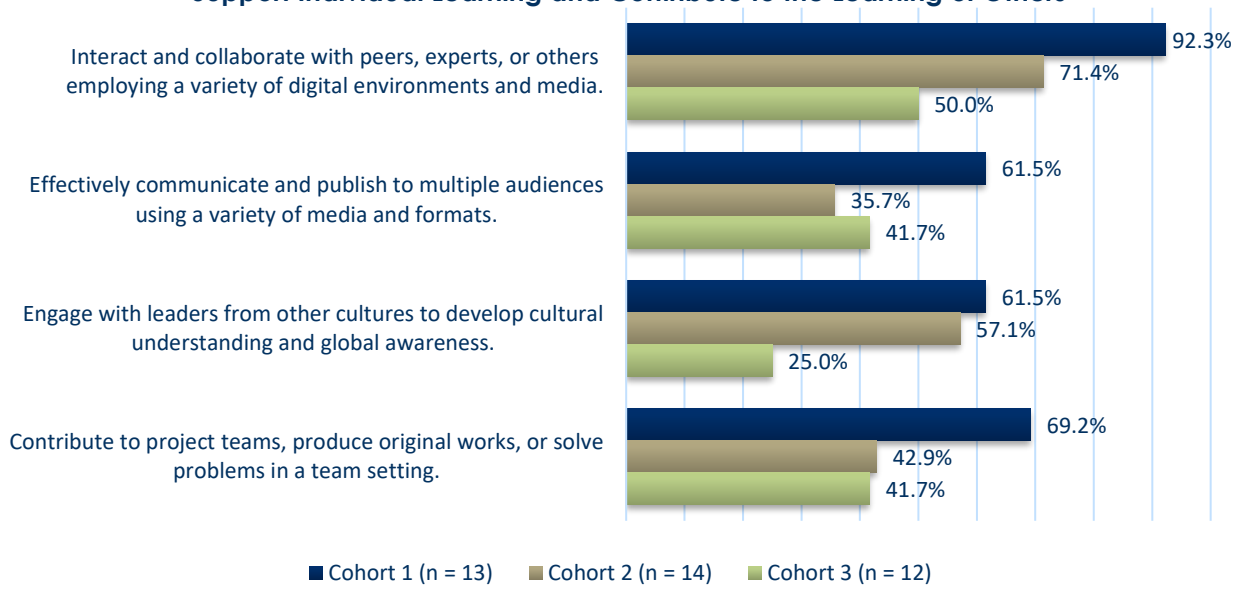
Observers were first asked to report whether there was evidence of educational technology use within the classrooms they observed, and 100% reported 'yes' for all three cohorts, including Cohort 1 (n = 13), Cohort 2 (n = 14), and Cohort 3 (n = 12). Additionally, 100% of observations reported that there was evidence that the teacher provides feedback or communicates with students digitally, and 97.4% of observations reported that there was evidence that students engage in the content through technology. Figures 8-13 below provide a detailed summary of walk-through observation data by cohort. In general, Cohort 1 classes showed the most frequent observations of students demonstrating the various skills and activities measured by the walk-through protocol.

Figure 8. Ways Students Demonstrate Creative Thinking and Problem Solving Skills in Mathematics to Innovate Products and Processes Using (Digital) Technology



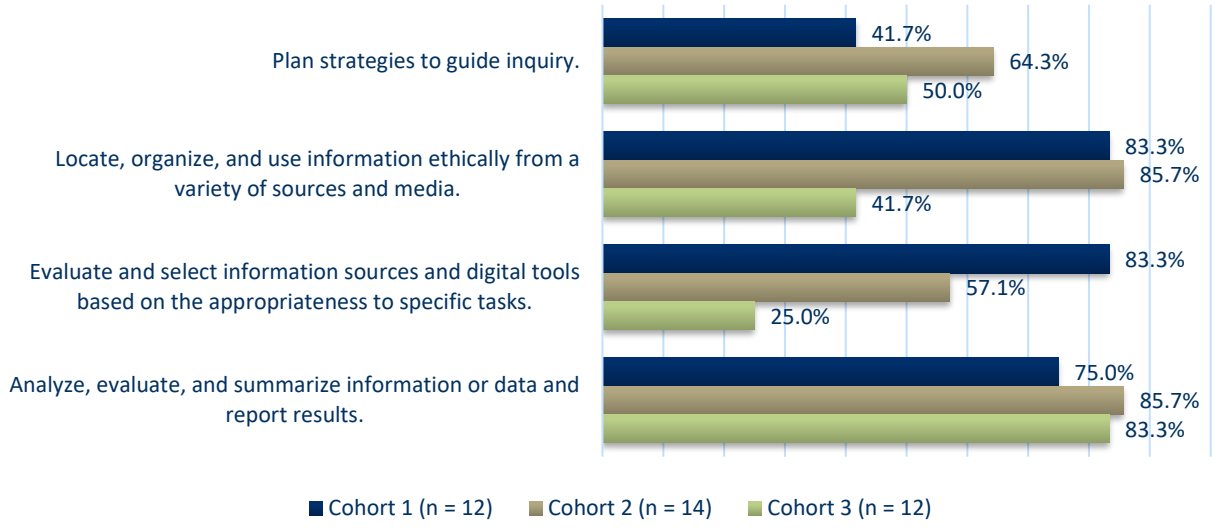
*Observers were asked to check all that apply

Figure 9. Ways Students Use Digital Media and Environments to Communicate and Work Collaboratively, Across the Global Community, to Support Individual Learning and Contribute to the Learning of Others



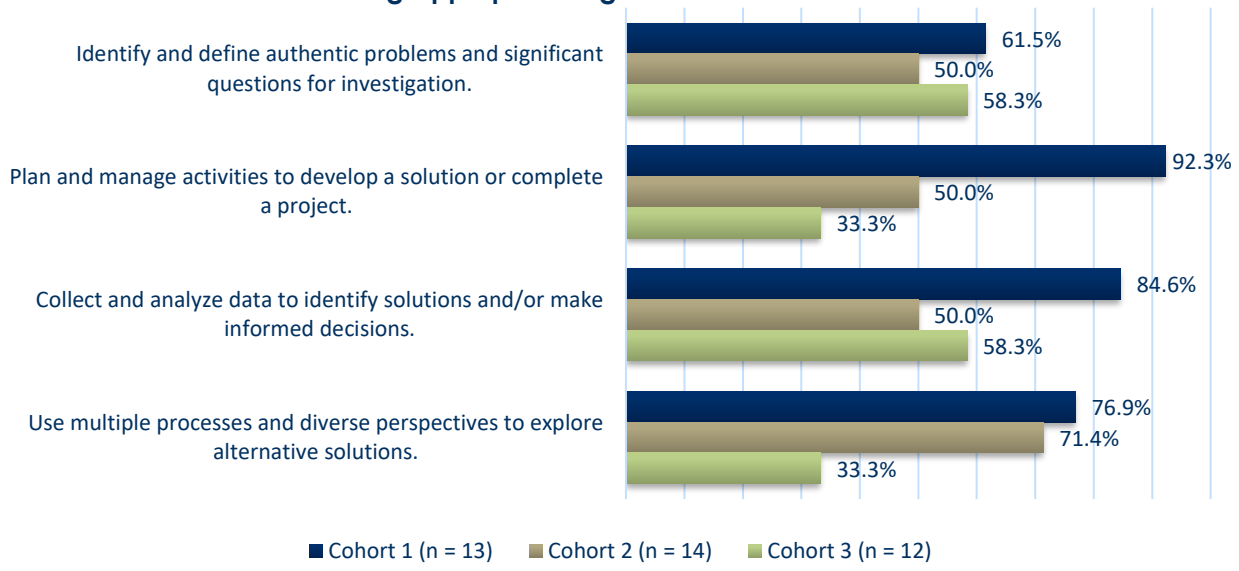
*Observers were asked to check all that apply

Figure 10. Ways Students Select and Apply Digital Tools to Gather, Evaluate, Validate, and Use Information



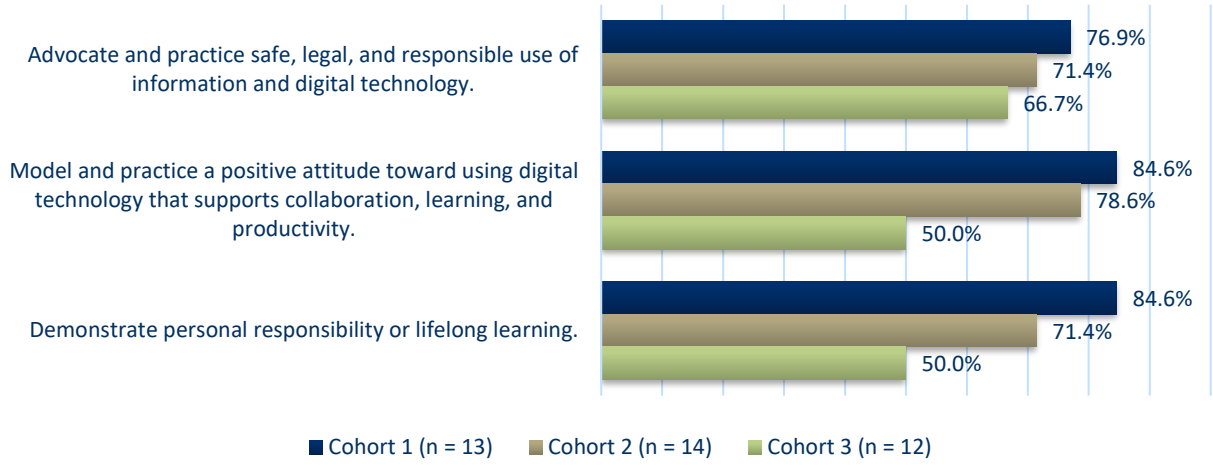
*Observers were asked to check all that apply

Figure 11. Ways Students Use Critical Thinking Skills to Plan and Conduct Research, Manage Projects, Solve Problems, and Make Informed Decisions Using Appropriate Digital Tools and Resources



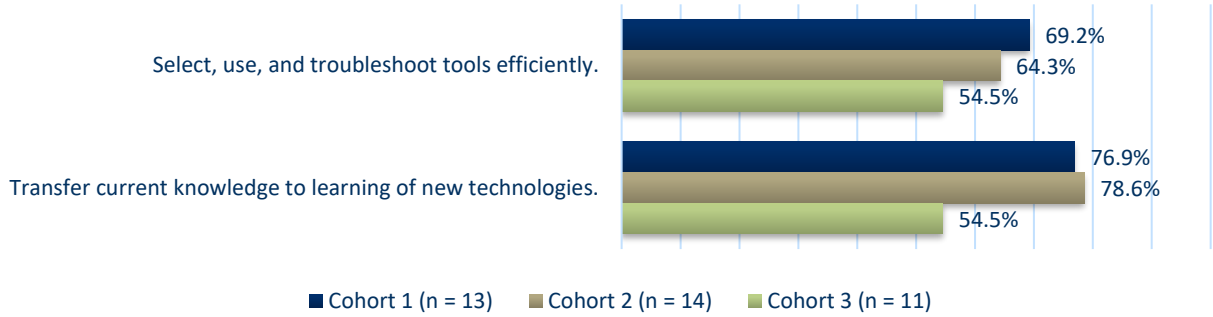
*Observers were asked to check all that apply

Figure 12. Ways Students Understand Issues Related to Digital Technology and Practice Legal, Ethical, and Responsible Behavior



*Observers were asked to check all that apply

Figure 13. Ways Students Utilize Technology Concepts and Tools to Learn



*Observers were asked to check all that apply

Observers also recorded specific digital tools students used in the classroom. Results are shown in Table 12. The most commonly reported tool was student computers, with 100.0% of observations reporting evidence of student use in Cohort 1 and Cohort 3 classrooms and 85.7% of observations reporting evidence in Cohort 2 classrooms. The second most commonly reported tool was projectors, with 76.9% of Cohort 1 observations, 71.4% of Cohort 2 observations, and 58.3% of Cohort 3 observations indicating evidence of student use. Schoology use was also reported relatively frequently, with at least half of all observations indicating evidence of student use. In general, observations of Cohort 1 and Cohort 2 classrooms showed the most frequent use of most digital tools, while observations of Cohort 3 classrooms generally showed the least frequent use of most digital tools.

Table 12. Digital Tools Students Used in the Classroom

Digital Tool	Cohort 1 Observations (n = 13)	Cohort 2 Observations (n = 14)	Cohort 3 Observations (n = 12)
Projector	76.9%	71.4%	58.3%
Student Computers (Dell Venue Pro 10)	100.0%	85.7%	100.0%
Schoology	53.8%	71.4%	50.0%
Mobile Devices	46.2%	50.0%	33.3%
OneNote	38.5%	57.1%	25.0%
Student Use of Active Stylus	30.8%	50.0%	16.7%
Online Video Lessons (Khan Academy, Discovery Ed, Teachertube, etc.)	38.5%	57.1%	25.0%
OneDrive (Cloud Storage)	53.8%	50.0%	25.0%
Online/Digital Collaboration	46.2%	28.6%	41.7%
Survey/Polling Apps and Websites (Socrative, etc.)	38.5%	0.0%	8.3%
Word	30.8%	42.9%	16.7%
Excel	30.8%	0.0%	8.3%

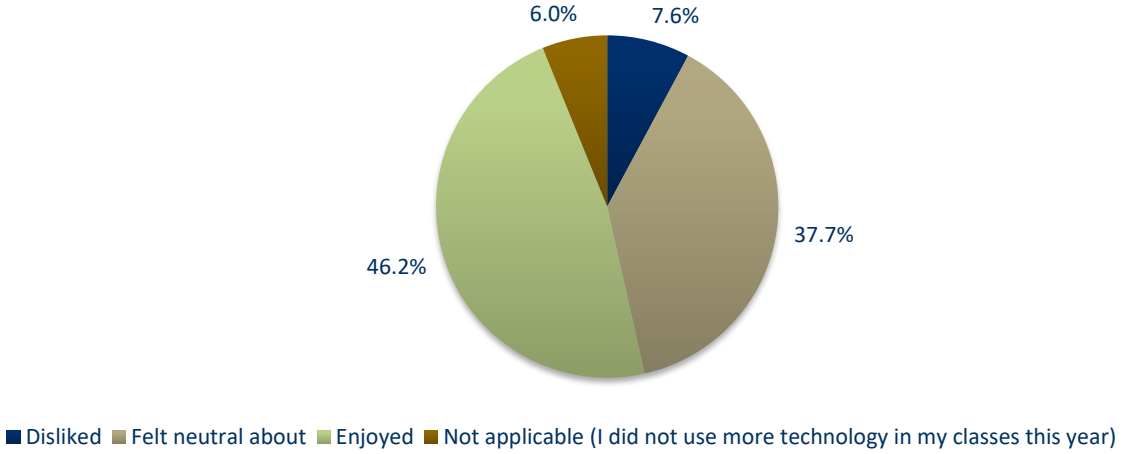
How are the new instructional strategies impacting student engagement?

Section Highlights:

On the student survey, students generally expressed positive or neutral opinions about use of technology in classrooms. In both quantitative and qualitative responses, some students indicated negativity toward technology use, but the majority of responses were positive. Teachers similarly indicated that student engagement has increased with technology incorporation.

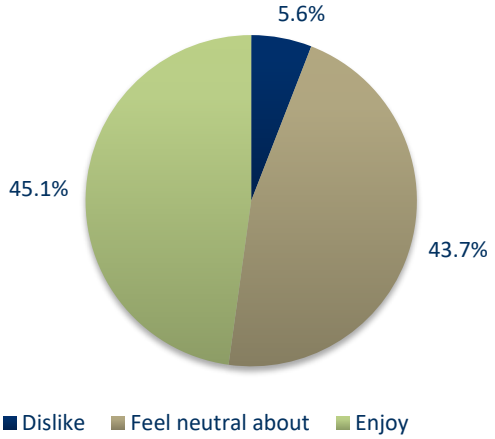
On the student survey, students rated the effect of technology on their classroom engagement by completing the statement, "I _____ using more technology in my Math class this school year." Figure 14 displays results, which indicate that nearly half of students (46.2%) enjoyed using more technology in their math class in SY 18-19. This rate is down slightly from SY 17-18 (54.1%), but remains fairly stable.

Figure 14. Reynolds Students' Feelings About Increased Use of Technology in Classrooms (n = 968)



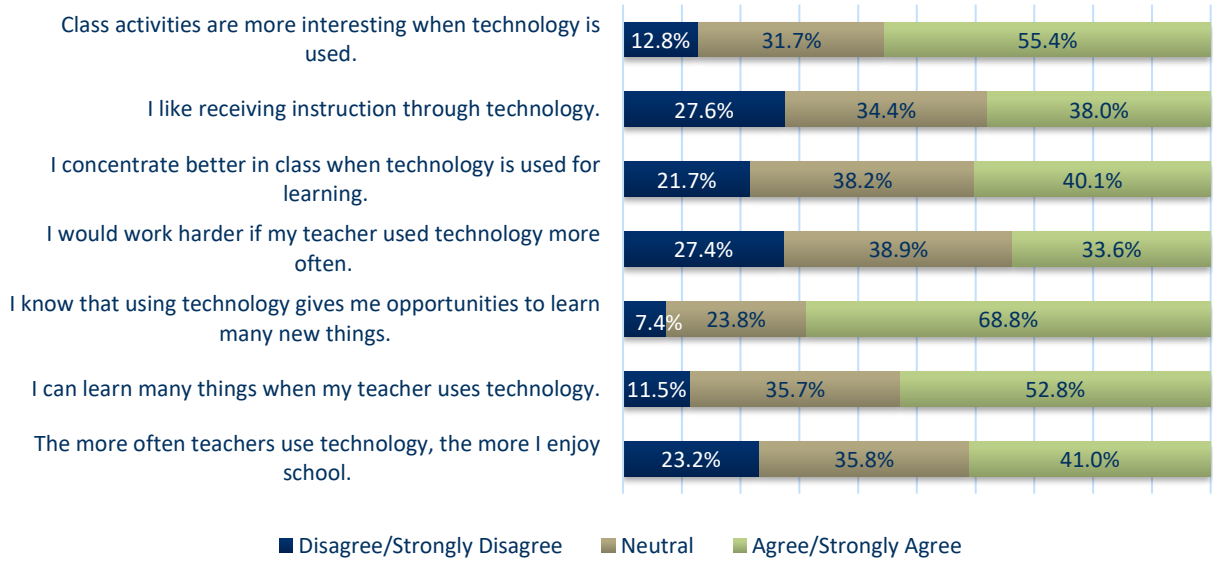
Similarly, students reported their enjoyment of learning when technology is used by completing the statement, "I _____ learning in class when technology is used." Results, shown in Figure 15, indicated that 94.4% of students enjoy or feel neutral about learning when technology is used.

Figure 15. Reynolds Students' Feelings About Learning when Technology is Incorporated (n = 968)



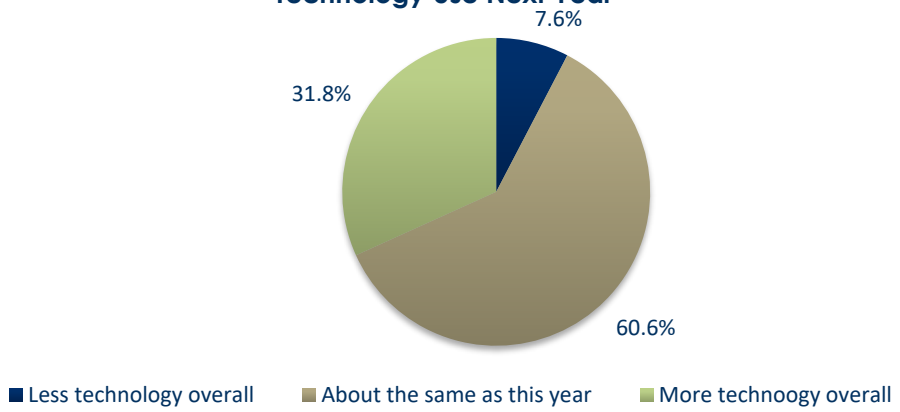
Students also reported their agreement with a variety of statements about learning and technology. As shown in Figure 16, the majority of students were neutral or positive about all of the statements, indicating low levels of negativity about the incorporation of technology in classroom learning. Of the statements measured, the highest number of students agreed or strongly agreed that using technology gives them opportunities to learn many new things. On the other hand, the highest number of students disagreed or strongly disagreed that they like receiving instruction through technology and that they would work harder if more technology were incorporated in class.

Figure 16. Reynolds Students' Feelings About Learning and Technology
(% Agree/Strongly Agree)
n = 964 - 968



When asked whether they hope teachers use less, about the same, or more technology in the next school year, 60.6% of Reynolds students indicated they would like about the same level of technology use next school year, as shown in Figure 17. A total of 31.8% of students indicated they would like more technology use overall, while 7.6% of students indicated they would like less technology use overall. Compared to SY 17-18, a higher number of students in SY 18-19 indicated desire for the same use of technology or more use of technology, indicating satisfaction with the level of technology use in SY 18-19, mixed with desire for even more technology use.

Figure 17. Reynolds Students' Desire for Technology Use Next Year



Students described whether their opinions had changed with regard to teachers incorporating more technology into their lessons. Students' opinions were primarily positive or neutral, with most students expressing their opinions of technology use in math class had stayed the same or improved. Of positive responses, many students mentioned that technology is helpful for learning and retention (n = 89) or fun and enjoyable (n = 78). Others described how technology makes learning and schoolwork more convenient or efficient (n = 50), helps students focus (n = 15), or helps with research and organization (n = 6). Table 13 provides sample responses in each category.

Table 13. Reynolds Students' Positive Opinions of Technology Integration

Theme	Sample Quotes
Technology is helpful for learning and retention (n = 89)	• *"My opinion on using technology in math class has changed drastically because I use to think that technology brought too much distraction to the classroom but now I think that it benefits kids with having the opportunity to do math differently."* • *"Using technology for math is pretty helpful. For example if you get an answer wrong, it shows you how to correctly do it. Technology gives us more things to do besides just using paper over and over again."* • *"It's helped me learn better overall this school year."*
Fun/enjoyable (n = 78)	• *"It is a bit more fun because we aren't stuck reading a book the whole time."* • *"Math isn't my most favorite subject, but I know it's a core subject. However with technology at times it is a little more fun."* • *I enjoy using more technology in class."* • *"I enjoy coming to class more than before. Last year it was boring in math without technology. These computers are cool, with the little pencil thingy."*

Theme	Sample Quotes
Helpful for focusing (n = 15)	• *"I learn a little more because I focus more than on a piece of paper."* • *"I feel like if we use paper it distracts me. I start to talk to the people around me."* • *"It helps some kids stay on task."*
Helpful for research and organization (n = 6)	• *"If the school (Math Class) had us use more technology we can learn more because we can look up stuff that we do not understand in."* • *"A lot because it helped me with my research and things I'm not sure on."* • *"If I don't understand something and my teacher is busy, I can ask Google or watch a video about it on YouTube."*
More convenient and efficient (n = 50)	• *"I learned that a lot of accounting jobs use excel which is a computer app. So math is more helpful and faster doing it on technology."* • *"Through Excel, I have learned that technology can help make math and displaying math easier.* • *"Well, when writing with pencil it makes my hand hurt, but with computer it's fun and faster. So I would prefer tech."* • *"I only been here for 2 or 3 months so in my opinion I'm glad that we use technology in school so that every time we have an incomplete assignment we can always check on our website, we can also check our grades or finish up classwork or homework online. I have experience how people tend to throw their work or grades in the trash without showing their parents and the easier way is to send their grades is through technology, by sending it straight to their email the easier way they can see how their son or daughter is doing through their classes."*

Some students expressed negative opinions regarding increased technology integration. Out of those students who expressed negative opinions, the majority (n = 48) described how they preferred previous modes of instruction. Others mentioned that technology use is distracting (n = 15), difficult/slow (n = 16), or inhibits learning (n = 7). Table 14 provides example responses in each category.

Table 14. Reynolds Student's Negative Opinions of Technology Integration

Theme	Sample Quotes
Prefer previous mode of instruction (n = 48)	• *"I dislike using technology in my classes. I personally like using written problems that I can do on paper."* • *"It changed a lot. I thought I would be better with more tech but I notice that I focus more when we use paper things. Also it gives the teacher more control on what type of problems we do so we can get the notes we need. I also think that it would help with spelling to do paper work instead."* • *"I don't mind technology in class, but I prefer paper."*
Inhibits learning (n = 7)	• *"I hate it, it slows my learning down."* • *"It is ineffective not everyone else uses it properly. It tends to not work a lot, hampering learning. It's unrefined and ineffective."* • *"Sometimes staring down at the screen too much with bright brightness makes me sleepy and makes me fall asleep."*

Theme	Sample Quotes
Distraction (n = 15)	• *"I think it's annoying to get up at the beginning and end of class to have to get a computer and crowd around a cart to put it away."* • *"I don't like the use of technology because it seems to distract me more than it does help me."* • *"Math class was fine with technology, but it is too tempting to use the technology for something else."* • *It's horrible, no one pays attention, they're too busy playing with the keys."*
Difficult time using (n = 16)	• *"At first I thought it was cool because we could like do other things while doing math but now I feel I could learn about the same if we didn't and it hasn't really added much in terms of learning. Also, at some points the computers can glitch and the whole lesson plans could mess up."* • *"I don't like it because it's way too confusing."* • *"The computers get frustrating."*

In interviews, teachers described how the majority of their students appear more engaged as technology has increased in their classrooms. One teacher provided an example of how technology can help make learning some topics more interesting and fun, saying, "If they're doing something that they hadn't done before, like instead of drawing any graph by hand or shading something, they do it on a computer, and it's super interesting to them. When we do decimals and they're graphing quarter tiers, they can play an online version. There's one called Battle Boats, which is like Battleship with coordinating planes and guessing where things are. They're playing against each other on their computers. And it was super fun. I don't think it would be feasible with paper and pencil to get to it and let them have fun. Technology gives us time with some activities, and kids love doing it." Another teacher shared a particularly successful case, saying:

> *Oh my gosh, huge increase. We live in a screen world. I don't want to use screens all the time, but I have a particular student who has been very disengaged except when it comes to this class, and we just started using the computers again after getting some of the technology stuff worked out. And he is just on it. He's with me. He's incorporated. He's writing on his device. He's talking. He's giving ideas. It's really kind of miraculous.*

Others described how engagement has varied by age and grade level. One teacher said, "Yes and no. My higher-end classes hate it. They want traditional, and whenever I try to do something with the computers with them—and I'm thinking my pre-calculus class—there's only one or two kids who are really on board and the rest of them are tapping their feet, waiting for me to do it the normal way. When I have my lower-level kids, they are itching to get their hands on it and most of the time I can keep them on task, so it depends on the level of the kids."

Are the new instructional strategies showing promise for improving academic outcomes?

Section Highlights:

The SY 18-19 evaluation provides some evidence that the new instructional strategies are showing promise for improving academic outcomes, but results were mixed. While 7th grade credit attainment, both within 7th grade and cumulatively through the end of 7th grade, was higher in all three treatment cohorts than the historical Comparison Group for both math credits and overall credits, differences were not significant or were in the opposite direction than expected for 8th and 9th grade math and overall credit attainment. Student survey data indicated students felt neutral or positive about the effects of technology on learning and focus in the classroom. Teachers indicated during interviews that they do see promise for new instructional strategies improving academic outcomes.

The Reynolds TechSmart grant focuses on improving student achievement in math, as measured by math assessment data, math and overall credit attainment data, and English learners' progress. To explore whether instructional practices are showing promise for improving students' credit attainment, PRE examined math and overall credit attainment for the Treatment Groups and historical Comparison Group. Sixth grade credit attainment data were not available for the historical Comparison Group due to a change in the student information system at the end of the 2011-12 school year. Note that math credit counts reset in 9th grade, at the start of high school.

Math Credit Attainment

Although 6th grade credit data were not available for the historical Comparison Group, Table 15 shows that Cohort 1 TechSmart students had significantly higher math credit attainment within 7th grade, $t(901) = 9.27$, $p < .01$ than the historical Comparison Group, and also had significantly higher cumulative math credits by the end of 7th grade, $t(901) = 11.91$, $p < .01$. In 8th grade, Cohort 1 TechSmart students had significantly higher cumulative math credit attainment by 8th grade than the historical Comparison Group, $t(789) = -2.78$, $p < .01$ but had a significantly lower math credit attainment within their 8th grade year. In 9th grade, Cohort 1 TechSmart students showed no statistically significant differences in math credit attainment within the 9th grade year or in cumulative math credit attainment by the end of 9th grade.

Similar to Cohort 1, Table 15 shows that that Cohort 2 TechSmart students had significantly higher math credit attainment in 7th grade, $t(1304) = -18.00$, $p < .001$ than the historical Comparison Group, and had significantly higher cumulative math credits by the end of 7th grade, $t(1304) = -16.31$, $p < .01$. In 8th grade, Cohort 2 TechSmart students did not show significantly different cumulative math credit attainment by the end of 8th grade than the historical Comparison Group and showed lower credit attainment within the 8th grade year than the historical Comparison Group.

Finally, Cohort 3 TechSmart students mirrored 7th grade results for the other cohorts, showing significantly higher math credit attainment in 7th grade, $t(1273) = -3.38$, $p < .01$ than the historical Comparison Group, and had significantly higher cumulative math credits by the end of 7th grade, $t(1273) = -9.24$, $p < .001$. Overall, math credit attainment results were mixed, but provide some evidence that there is promise of new instructional strategies impacting student achievement outcomes.

Table 15. Math Credit Attainment

Math Credits								
Grade	**Cohort 1**		**Cohort 2**		**Cohort 3**		**Historical Comparison Group**	
	Att.	**Cum.**	**Att.**	**Cum.**	**Att.**	**Cum.**	**Att.**	**Cum.**
6th Grade	1.07 (n = 163)	1.07 (n = 163)	.78 (n = 628)	.78 (n = 628)	.84 (n = 554)	1.02 (n = 554)	N/A	N/A
7th Grade	.92* (n = 149)	1.98* (n = 149)	.97* (n = 552)	2.03* (n = 552)	.74* (n = 521)	1.59* (n = 521)	.56 (n = 754)	1.47 (n = 754)
8th Grade	.69 (n = 125)	3.02* (n = 125)	.67 (n = 481)	2.76 (n = 481)	--	--	.95* (n = 666)	2.75 (n = 666)
9th Grade	.61 (n =104)	.72 (n=104)	--	--	--	--	.58 (n = 465)	.72 (n = 465)

Note: Att. = Attained; Cum. = Cumulative; * = statistically significant difference

Overall Credit Attainment

Similar to math credit attainment, Table 16 shows that Cohort 1 TechSmart students earned a significantly higher number of overall credits than the historical Comparison Group in 7th grade, t (901) = 8.76, p <.01. Differences between Cohort 1 students and the historical Comparison group were not significant in 8th or 9th grade.

Cohort 2 TechSmart students earned a significantly higher number of overall credits than the historical Comparison Group in 7th grade, t(1304) = -27.54, p <.001. Cohort 2 TechSmart students also had significantly higher overall cumulative credits in 7th grade than the historical Comparison Group, t(1304) = -15.82, p < .001. In 8th grade, Cohort 2 students earned significantly less overall credits in the 8th grade year and less credits cumulatively by the end of 8th grade than the historical Comparison Group.

Cohort 3 TechSmart students also earned a significantly higher number of overall credits than the historical Comparison Group in 7th grade, t(1273) = -11.79, p <.001, and had significantly higher overall cumulative credits by the end of 7th grade than the historical Comparison Group, t(1273) = -5.19, p < .001.

Table 16. Overall Credit Attainment

Overall Credits								
Grade	**Cohort 1**		**Cohort 2**		**Cohort 3**		**Historical Comparison Group**	
	Att.	**Cum.**	**Att.**	**Cum.**	**Att.**	**Cum.**	**Att.**	**Cum.**
6th Grade	5.58 (n = 132**)	5.58 (n = 132)	4.66 (n = 628)	4.66 (n = 628)	6.90 (n = 554)	6.00 (n = 554)	N/A	N/A
7th Grade	5.30* (n = 149)	10.85 (n = 149)	7.03* (n = 552)	13.35* (n = 552)	5.25* (n = 521)	11.30* (n = 521)	4.12 (n = 754)	10.39 (n = 754)
8th Grade	6.72 (n = 125)	19.58 (n = 125)	5.01 (n = 481)	18.59 (n = 481)	--	--	6.69* (n = 666)	19.34* (n = 666)
9th Grade	4.90 (n =104)	5.09 (n=104)	--	--	--	--	5.28 (n = 465)	5.50 (n = 465)

Note: Att. = Attained; Cum. = Cumulative; * = statistically significant difference; ** = Overall credit data were missing for 31 Cohort 1 students in 6th grade

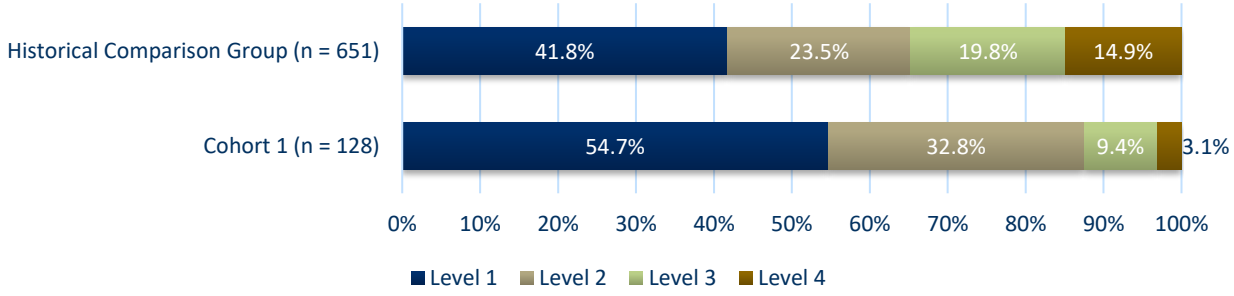
Smarter Balanced Math Assessment

The Smarter Balanced assessment system is aligned to Common Core state standards and determines students' progress toward college and career readiness. The end-of-year Smarter Balanced math assessment was given to students to measure math achievement. Scores from 8th grade are presented for Cohort 1 and the historical Comparison Group.

Based on scaled scores, students fall into one of four achievement level categories. Level 1 indicates a student has not met the achievement standard and needs substantial improvement, Level 2 indicates the student has nearly met the achievement standard and may require further development, Level 3 indicates the student has met the achievement standard and demonstrates progress toward mastery, and Level 4 indicates the student has exceeded the achievement standard and demonstrates advanced progress toward mastery. For 8th grade, a score under 2504 indicates Level 1 achievement, a score of 2504-2585 indicates Level 2 achievement, a score of 2586-2652 indicates Level 3 achievement, and a score of 2652 or more indicates Level 4 achievement.

Figure 18 presents the percentage of students in Cohort 1 and the historical Comparison Group who achieved Level 1, Level 2, Level 3, and Level 4 scores. The historical Comparison group had substantially more students at Level 3 and Level 4 (i.e., meeting or exceeding the achievement standard) with a total of 34.7% of students, compared to only 12.5% of Cohort 1 students. Likewise, Cohort 1 had

Figure 18. 8th Grade Smarter Balanced Math Assessment Levels



substantially higher percentages of students at Level 1 (54.7%) and Level 2 (32.8%) than did the historical Comparison Group.

Student survey data that indicate the impact of technology on learning are presented in Figure 19. The majority of students reported that technology had a neutral or positive impact on their learning. Almost half of students (49.1%) responded that they learned the same amount whether there was technology use in math class or not.

Figure 19. Reynolds School District Effects of Technology on Learning
(n = 968)

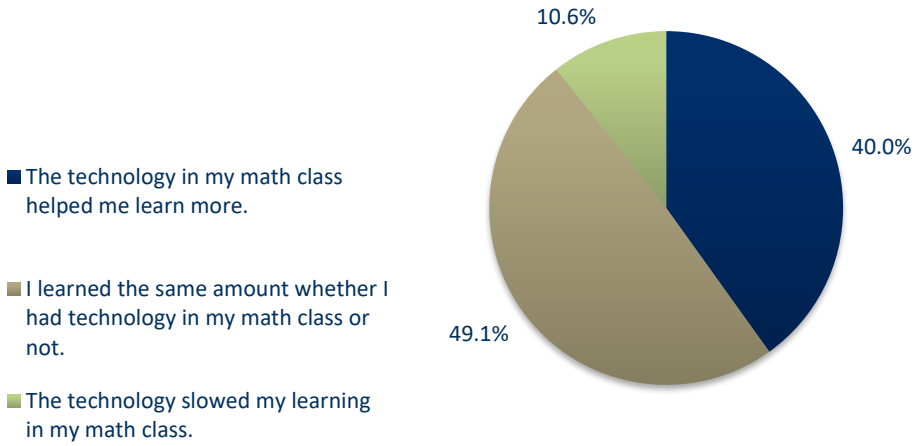
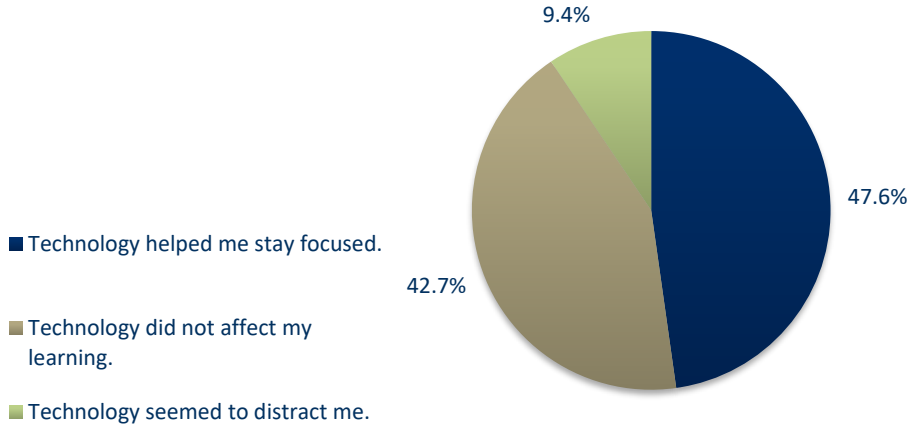


Figure 20 displays student responses regarding their experience with new technology in the classroom in Year 4 of the grant, and shows that 47.6% of students believed that technology positively affected their learning by helping them stay focused. Less than 10% of students indicated technology seemed to distract them, while 42.7% of students indicated technology did not seem to affect their learning.

Figure 20. Reynolds School District Effects of Technology on Classroom Focus
(n = 968)



Teachers who were interviewed commented on the promise for improving student academic outcomes through the use of technology-supported instruction. Teachers generally indicated that they did see some evidence that student academic outcomes have improved, but they were unable to attribute it to technology use specifically. One teacher said, “There’s a correlation. I don't know if it’s a causation. It could be coming from more experience and more years of teaching, or it could be from the technology. I would like to think I’m a better teacher though. I think my kids are achieving better, and at least there’s more buy-in. That’s mostly because technology allows them feedback immediately. They can see progress and see growth when it happens.”

Leaders also commented on the promise seen for improving student academic outcomes. When asked whether they see promise, one leader shared that the evidence they have seen is in the collaboration among teachers within and across schools:

Yes. I do. I think our math department – at the middle school level, they have been working within teams across our three middle schools, and so that teacher collaboration has definitely supported the teachers and aligned our practices throughout our middle schools, which helps the students overall in middle school. We also have a fairly high mobility rate between our three middle schools, and so that alignment supports students as they may move between our three middle schools throughout the year.

At our high school, the math department meets together. We just have one comprehensive high school that's involved in the grant, and they have, over the last three or four years, really became very cohesive with not only what they're teaching in their courses, but also how they're teaching. Assessments have been very much aligned, and the teacher collaboration and the teacher talk around math is increased.

Do instructional practices show promise for improving student academic outcomes with at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards)?

Section Highlights:

The results of the subgroup analysis provide preliminary evidence that instructional practices are improving academic outcomes for at-risk student subgroups for students in 7th grade. After four years of implementation, with data from three cohorts and a historical Comparison Group, students in all three cohorts showed higher average and cumulative math credit attainment in 7th grade. Data from 8th and 9th grade did not provide evidence of increased credit attainment in treatment cohorts compared to the historical Comparison Group.

To better understand whether technology-supported instructional practices are showing promise for improving academic outcomes with at-risk student subgroups, math credit attainment was examined by subgroup for all three Treatment Cohorts and for Comparison Group students.

7th Grade Math Credit Attainment

Table 17 below presents 7th grade math credit attainment data for Cohort 1, Cohort 2, Cohort 3, and the historical Comparison Group, as well as the three at-risk subgroups for each group. For average math credits attained during 7th grade, after two years of implementation, students in all Treatment Group cohorts showed higher math credit attainment across all subgroups relative to the historical Comparison Group.

For Cohort 1, an independent samples t-test revealed that this difference was significant for the LEP (ELL) subgroup, $t(315) = 11.32$, $p < .01$, and students of color $t(583) = 11.01$, $p < .01$. For Cohort 2, an independent samples t-test revealed that this difference was significant for the LEP (ELL) subgroup,

t(465) = -11.90, *p* <.001, the SPED student subgroup, *t*(204) = -4.29, *p* < .001, and students of color *t*(894) = -14.92, *p* <.001. For Cohort 3, an independent samples t-test revealed that this difference was significant for the LEP (ELL) subgroup, *t*(535) = -7.32, *p* <.001, the SPED student subgroup, *t*(204) = -3.93, *p* < .001, and students of color *t*(857) = -8.63, *p* <.001.

Table 17. 7th Grade Average Math Credit Attainment for At-Risk Subgroups

Average Math Credits Attained				
	Cohort 1	**Cohort 2**	**Cohort 3**	**Historical Comparison Group**
All Students	.92* (n = 149)	.97* (n = 552)	.74* (n = 521)	.56 (n = 754)
LEP Students	1.24* (n = 32)	1.01* (n = 182)	.75* (n = 252)	.54 (n = 285)
SPED	.63 (n = 12)	.83* (n = 67)	.74* (n = 67)	.52 (n = 139)
Students of Color	.95* (n = 115)	.97* (n = 426)	.75* (n = 389)	.55 (n = 470)

7th Grade Cumulative Math Credit Attainment

Table 18 below presents cumulative math credit attainment data from the end of 7th grade for Cohort 1, Cohort 2, Cohort 3, and the historical Comparison Group, as well as the three at-risk subgroups for each group. For cumulative math credits attained by the end of 7th grade, after two years of implementation, Cohort 1, Cohort 2, and Cohort 3 students were showing higher cumulative math credit attainment across all subgroups relative to the historical Comparison Group.

For Cohort 1, an independent samples t-test revealed that this difference was significant for the LEP subgroup, *t*(315) = 9.50, *p* <.01 and students of color, *t*(583) = 7.73, *p* <.01. For Cohort 2, an independent samples t-test revealed that this difference was significant for the LEP (ELL) subgroup, *t*(465) = -12.63, *p* <.001, the SPED student subgroup, *t*(204) = -6.19, *p* < .001, and students of color *t*(894) = -12.82, *p* <.001. For Cohort 3, an independent samples t-test revealed that this difference was significant for the LEP (ELL) subgroup, *t*(535) = -2.54, *p* <.05, the SPED student subgroup, *t*(204) = -3.73, *p* < .001, and students of color *t*(857) = -2.46, *p* <.05. These results are promising and provide evidence that instructional practices are improving academic outcomes with at-risk student subgroups.

Table 18. 7th Grade Cumulative Math Credit Attainment for At-Risk Subgroups

Average Cumulative Math Credits				
	Cohort 1	**Cohort 2**	**Cohort 3**	**Historical Comparison Group**
All Students	1.98* (n = 149)	2.03* (n = 552)	1.59* (n = 521)	1.47 (n = 754)
LEP Students	2.52* (n = 32)	2.24* (n = 182)	1.62* (n = 252)	1.49 (n = 285)
SPED	1.40 (n = 12)	2.03* (n = 67)	1.79* (n = 67)	1.31 (n = 139)
Students of Color	1.98* (n = 149)	2.03* (n = 426)	1.60* (n = 389)	1.50 (n = 470)

*Indicates a significant difference

8th Grade Math Credit Attainment and Cumulative Math Credit Attainment

Table 19 presents 8th grade math credit attainment data for Cohort 1 and the historical Comparison Group, as well as the three at-risk subgroups for each group. For average math credits attained during 8th grade, after three years of implementation, Cohort 1 and Cohort 2 students were showing lower math credit attainment across all subgroups relative to the historical Comparison Group. This finding that the

historical group is outperforming the Cohort 1 students for 8th grade credit attainment is consistent with the full Cohort analysis.

Table 19. Cohort 1 8th Grade Math Credit Attainment for At-Risk Subgroups

	Cohort 1		Cohort 2		Historical Comparison Group	
	Average Math Credits Attained	Average Cumulative Math Credits	Average Math Credits Attained	Average Cumulative Math Credits	Average Math Credits Attained	Average Cumulative Math Credits
All Students	.69 (n = 125)	3.02* (n = 125)	.67 (n = 481)	2.76 (n = 481)	.95* (n = 666)	2.75 (n = 666)
LEP Students	.70 (n = 29)	3.59* (n = 29)	.64 (n = 168)	2.92 (n = 168)	.99* (n = 256)	2.81 (n = 256)
SPED	.61 (n = 9)	2.31 (n = 9)	.58 (n = 56)	2.73 (n = 56)	.80* (n = 122)	2.38 (n = 122)
Students of Color	.68 (n = 96)	3.04* (n = 96)	.67 (n = 379)	2.75 (n = 379)	.97* (n = 417)	2.81 (n = 417)

9th Grade Math Credit Attainment and Cumulative Math Credit Attainment

Table 20 presents 9th grade math credit attainment data for Cohort 1 and the historical Comparison Group, as well as the three at-risk subgroups for each cohort. All differences between Cohort 1 and the historical Comparison Group were non-significant, with the exception of math credits attained within the 9th grade year for LEP students. For 9th grade math credit attainment (non-cumulative), LEP students in Cohort 1 had significantly higher credit attainment than LEP students in the historical Comparison Group, $t(219) = -3.00$, $p < .01$.

Table 20. Cohort 1 9th Grade Math Credit Attainment for At-Risk Subgroups

	Cohort 1		Historical Comparison Group	
	Average Math Credits Attained	Average Cumulative Math Credits	Average Math Credits Attained	Average Cumulative Math Credits
All Students	.61 (n = 104)	.72 (n = 104)	.58 (n = 465)	.72 (n = 465)
LEP Students	.75* (n = 26)	.75 (n = 26)	.47 (n = 195)	.53 (n = 195)
SPED	.50 (n = 8)	.50 (n = 8)	.41 (n = 84)	.43 (n = 84)
Students of Color	.59 (n = 82)	.71 (n = 82)	.52 (n = 301)	.63 (n = 301)

ELPA Assessment

Table 21 below presents the ELPA21 results for Cohort 1 students in 6th, 7th, and 8th grade, as well as Cohort 2 students in 6th and 7th grade and Cohort 3 students in 6th grade. Over 80% of students in each cohort and grade level scored in the "Progressing" category.

Table 21. ELPA21 Results

Proficiency Determination	Cohort 1 6th Grade (n = 34)	Cohort 1 7th Grade (n = 26)	Cohort 1 8th Grade (n = 22)	Cohort 2 6th Grade (n = 183)	Cohort 2 7th Grade (n = 141)	Cohort 3 6th Grade (n = 166)
Emerging	--	--	--	6.0% (n = 11)	6.4% (n = 9)	6.0% (n = 10)
Progressing	82.4% (n = 28)	92.3% (n = 24)	81.8% (n = 18)	83.1% (n = 152)	83.0% (n = 117)	80.1% (n = 133)
Proficient	17.6% (n = 6)	7.7% (n = 2)	18.2% (n = 4)	10.9% (n = 20)	10.6% (n = 15)	13.9% (n = 23)

Smarter Balanced Math Assessment

Figure 21 below presents the Smarter Balanced math assessment results for 8th grade LEP students from Cohort 1 and the historical Comparison group. The historical Comparison Group showed higher percentages of LEP students at Level 3 and Level 4 scores on the Smarter Balanced math assessment, indicating higher percentages of students meeting or exceeding the achievement standard. In total, 17.6% of historical Comparison Group LEP students achieved Level 3 or Level 4 scores, while only 3.3% of Cohort 1 LEP students achieved Level 3 and no Cohort 1 LEP students achieved Level 4.

Figure 21. Smarter Balanced Math Assessment Levels for LEP Students

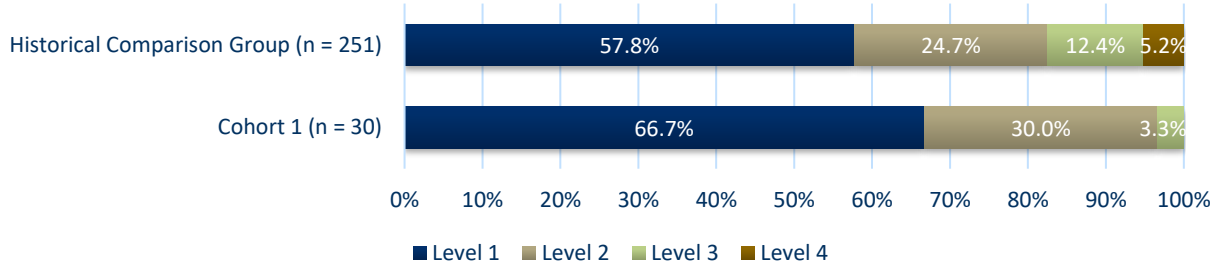
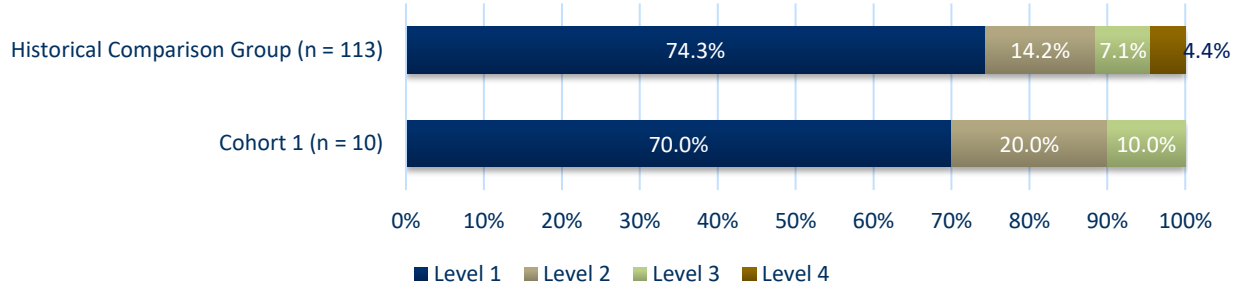


Figure 22 below presents the Smarter Balanced math assessment results for 8th grade SPED students from Cohort 1 and the historical Comparison group. The historical Comparison Group showed higher percentages of SPED students meeting or exceeding the achievement standard (i.e., Level 3 or 4 scores), but the difference was minimal compared to all students and compared to other at-risk subgroups. A total of 11.5% of historical Comparison Group SPED students achieved Level 3 or 4 scores, while a total of 10.0% of Cohort 1 SPED students achieved Level 3 or 4 scores. Cohort 1 had a lower percentage of

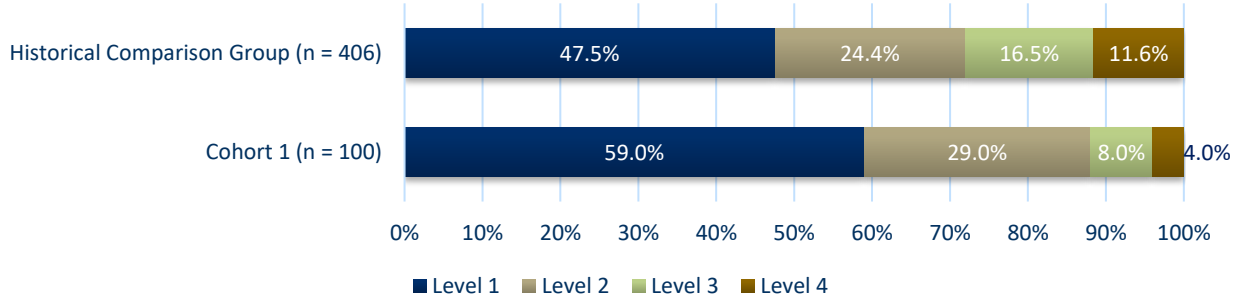
Figure 22. Smarter Balanced Math Assessment Levels for SPED Students



SPED students at Level 1 on the Smarter Balanced math assessment than did the historical Comparison Group.

Figure 23 below presents the Smarter Balanced math assessment results for 8th grade students of color from Cohort 1 and the historical Comparison group. The historical Comparison Group showed higher percentages of SPED students meeting or exceeding the achievement standard (i.e., Level 3 or 4 scores). A total of 28.1% of historical Comparison Group students of color achieved Level 3 or 4 scores in 8th grade, while a total of 12.0% of Cohort 1 students of color achieved Level 3 or 4 scores in 8th grade.

Figure 23. Smarter Balanced Math Assessment Levels for Students of Color



During interviews, several teachers provided examples of how technology-supported instruction is showing promise for improving student academic outcomes for at-risk subgroups. Several teachers emphasized the value of technology for assisting ELL students and students with IEPs. One teacher shared:

I believe that it helps to close that achievement gap because it's allowing access for all. It really has improved. I don't see a big difference racially. I have reasonably diverse class. I just see a lot more engagement overall. But especially with the kids that are on IEPs. I really see that as improving their outlook, improving their sense of self and their sense that they can do it. Their achievement I feel is stronger. So then it's showing up in their work.

Leaders emphasized similar points. One leader shared, "I go back to the whole notion of being able to differentiate on a much broader scale than ever before. I think that is the answer. It's an equity thing. Meeting kids where they're at. We have much greater capacity for meeting kids where they are at on an individual basis than we ever had before." Relatedly, teachers described efforts to differentiate instruction and the benefits provided by technology for facilitating differentiation by skill level. One teacher shared:

The technology allows me to have a couple kids in my class that, instead of working on 7th grade curriculum, we've offered them the ability to use another program called Kahn Academy that we use where they can work at their level. I have some 3rd grade math students in my 7th grade math class. The stuff I'm asking them to do is way beyond their scope. And so, if I can say hey, I need you to work on this 3rd grade standard and this 4th grade standard and increase your math understanding so that

you're not going to be necessarily ready for 8th grade next year, but you won't be as far behind as you would be without filling in some of these gaps. Without the technology, there'd be way too many curricula or levels of math that I'd have to try to figure out how to teach in my classroom.

Interview participants shared different perspectives surrounding access to technology and content outside of the classroom. One teacher said, "I feel a little limited in that students can't take [devices] home, so I don't feel like it's equitable to have any type of online factor in their homework, even though a good majority of them could probably access it. But I just don't think it's fair to those that can't." Another teacher shared a different perspective on access, stating, "The other thing that I like about the tech is that they can access my content anywhere at any time. If they're in another classroom here working with their special ed teacher or in their reading class, or in their intervention math class or maybe at home, if they have access to an internet-based computer, they can get in and get my work without having to figure out oh, I left this in class or back in my locker or whatever. There are no real excuses for all those things that hold some of those kids back as well."

During the year-end survey, teachers provided examples of how they used technology to support instruction for at-risk subgroups. No examples were provided by Cohort 3 teachers, but example responses from Cohort 1 and Cohort 2 teachers are provided in Table 22.

Table 22. Teachers' Use of Technology-Supported Instruction with At-Risk Subgroups

"Differentiated instruction; Access to online supports as needed; Immediate feedback; Student choice." (Cohort 1)
"Identified a lack of a certain skill, used tech to get extra practice." (Cohort 1)
"Encouraging students to research vocabulary that they do not understand using the internet." (Cohort 1)
"Access to quizzes at home with tutoring videos. After school time on computer for other subject tasks." (Cohort 1)
"We often use Khan Academy assignments in class. If one student has passed a lesson and another hasn't I will often team them. I also use Khan to have students see what they got wrong and why, as well as refresh their memories with quick video tutorials." (Cohort 2)
"Students can refer back to the notes from class if they need extra help or are absent." (Cohort 2)
"Being allowed to read and write with assistance." (Cohort 2)

Is the rate of student growth in one or more AHR outcomes greatest for at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards)?

Section Highlights:

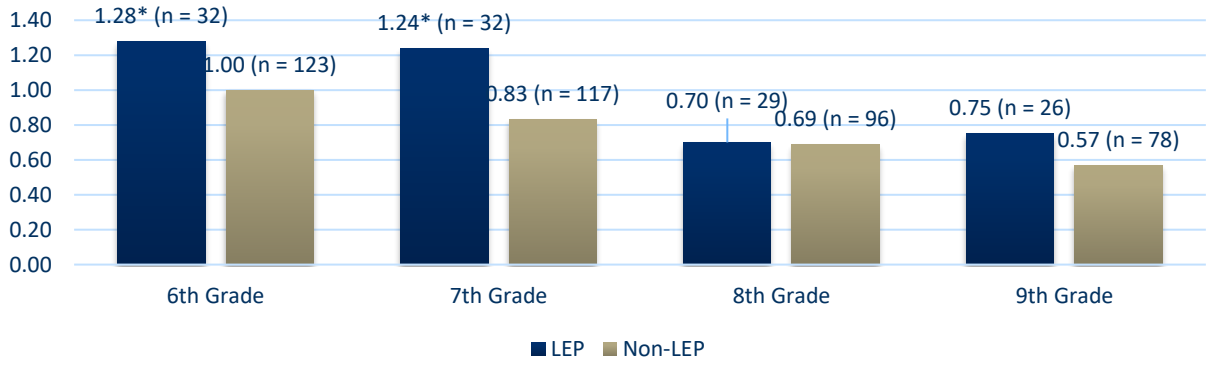
Based on analysis of math credit attainment, the rate credit attainment has at times been significantly greater for LEP students than non-LEP students, for both Cohort 1 and Cohort 2, but not for Cohort 3. Results for SPED and minority students are promising as they show very little evidence of an achievement gap in Math credit attainment. Additionally, results from the Smarter Balanced math assessment are promising, revealing no significant differences in test scores for at-risk subgroups in Cohort 1, compared to all other Cohort 1 students.

PRE examined math credit attainment data and Smarter Balanced math assessment data to assess how student progress may differ for at-risk subgroups as compared to non-at-risk subgroups. Math credit data were examined for Cohort 1, Cohort 2, and Cohort 3. Results are presented below and include data from: Cohort 1 students at 6th, 7th, 8th, and 9th grade; Cohort 2 at 6th, 7th, and 8th grade; and Cohort 3 at 6th and 7th grade. Smarter Balanced math assessment data were examined in Cohort 1 for 8th grade (SY 17-18).

Math Credit Attainment

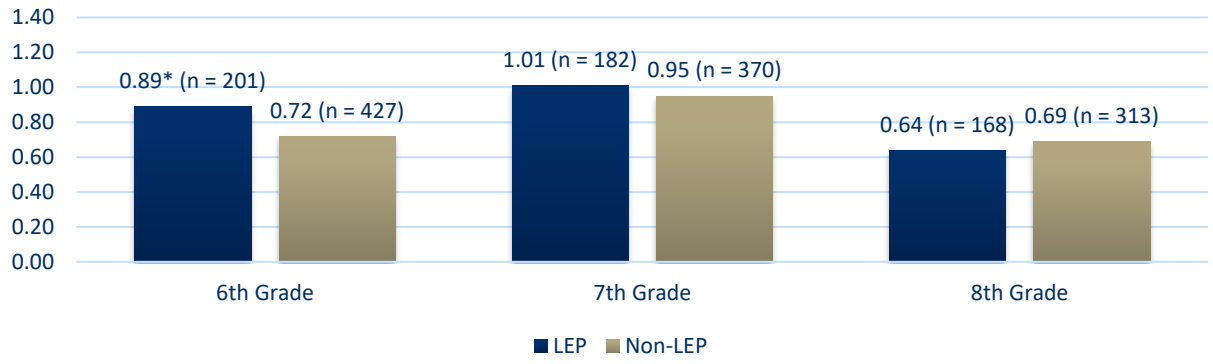
As shown in Figure 24 below, LEP TechSmart students earned significantly more math credits in 6th, grade ($t(153) = -3.13$, $p < .01$) and 7th grade ($t(147) = -4.93$, $p < .001$), than non-LEP TechSmart students. There was no significant difference between LEP and non-LEP student math credit attainment in 8th or 9th grade for Cohort 1.

Figure 24. Cohort 1 Math Credit Attainment for LEP Subgroup



As shown in Figure 25 below, Cohort 2 LEP TechSmart students earned significantly more Math credits in 6th grade ($t(626) = -7.13$, $p < .001$) than non-LEP students. Differences between LEP and non-LEP Cohort 2 students were not significant in 7th or 8th grade.

Figure 25. Cohort 2 Math Credit Attainment for LEP Subgroup



As shown in Figure 26 below, there were no significant differences in math credit attainment for 6th or 7th grade between LEP and non-LEP students in Cohort 3.

Figure 26. Cohort 3 Math Credit Attainment for LEP Subgroup

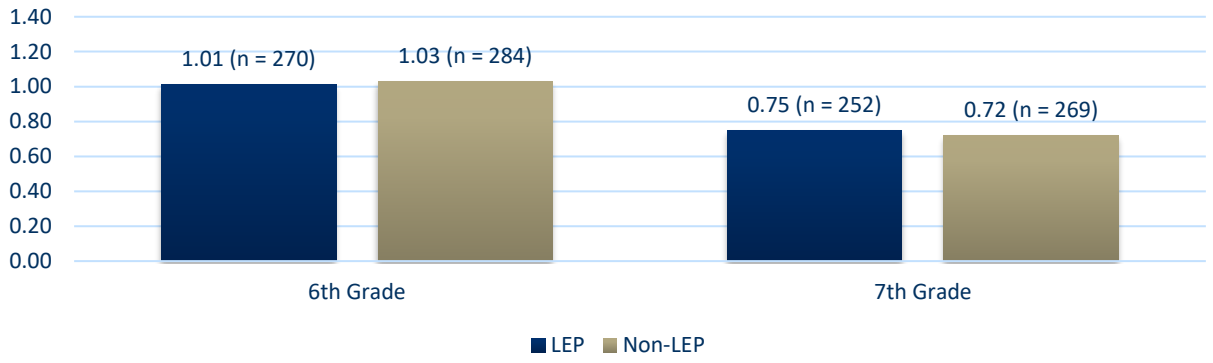
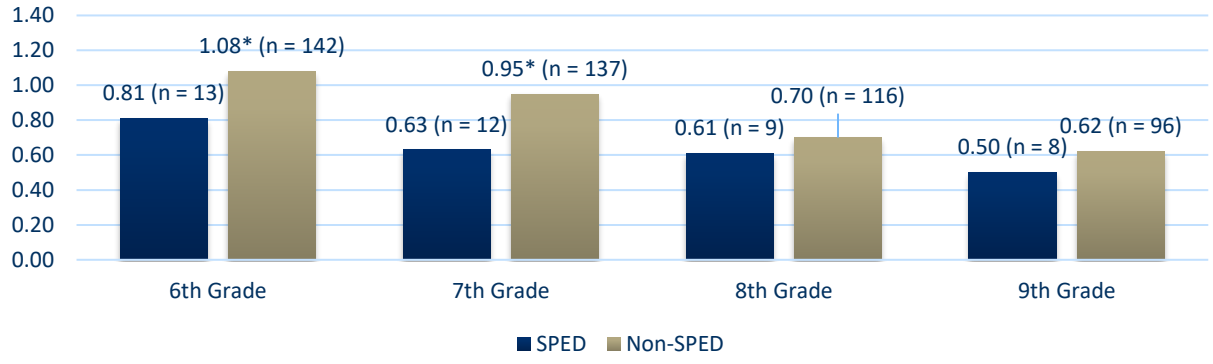


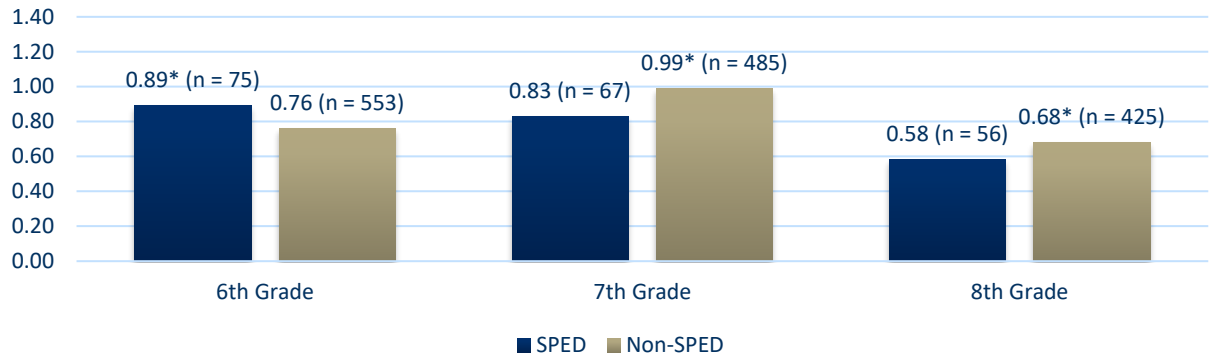
Figure 27 shows math credit attainment for Cohort 1 SPED TechSmart students and non-SPED TechSmart students. In 6th, 7th, 8th, and 9th grade, non-SPED students earned a higher number of math credits on average. Overtime, the achievement gap between SPED and non-SPED TechSmart students has decreased.

Figure 27. Cohort 1 Math Credit Attainment for SPED Subgroup



For Cohort 2, SPED TechSmart students earned significantly more math credits in 6th grade ($t(626) = -3.81$, $p < .001$) than non-SPED TechSmart students, but significantly less math credits in 7th grade ($t(550) = 2.37$, $p < .05$) and 8th grade ($t(479) = 1.98$, $p < .05$), as shown in Figure 28.

Figure 28. Cohort 2 Math Credit Attainment for SPED Subgroup



For Cohort 2, SPED TechSmart students earned significantly more math credits in 6th grade ($t(552) = -9.06$, $p < .001$) than non-SPED TechSmart students, but there was no difference in math credit attainment in 7th grade, providing evidence of no achievement gap for SPED students in Cohort 2 as shown in Figure 29.

Figure 29. Cohort 3 Math Credit Attainment for SPED Subgroup

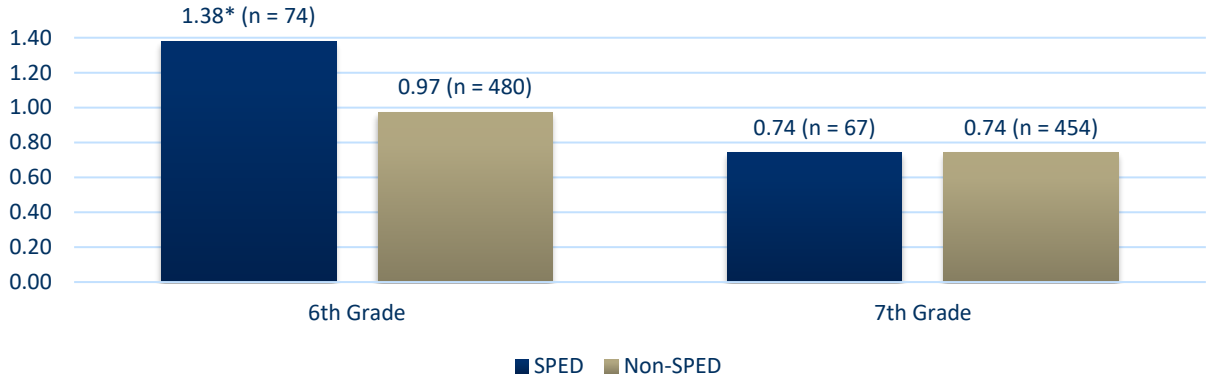
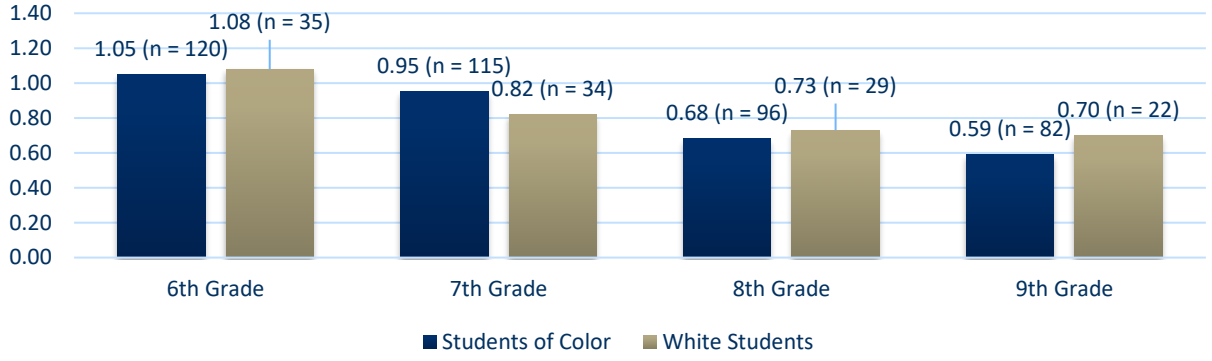


Figure 30 shows math credit attainment for Cohort 1 TechSmart students of color and all other students in 6th, 7th, 8th, and 9th grade. There were no significant differences between these two groups in any year. The

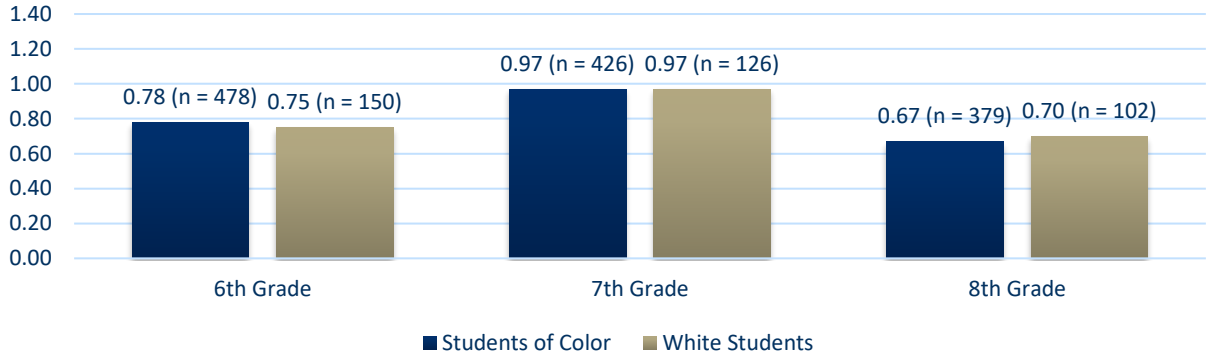
achievement gap for Cohort 1 students of color has remained very small over the course of the grant.

Figure 30. Cohort 1 Math Credit Attainment for Students of Color



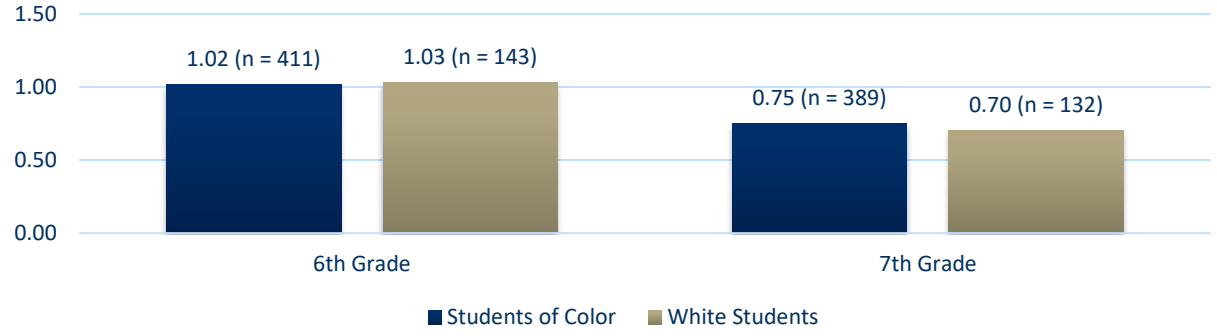
Similar to Cohort 1, there were no significant differences between Cohort 2 TechSmart students of color and all other students in 6th, 7th, or 8th grade math credit attainment, as shown in Figure 31. For Cohort 2, there appear to be no significant achievement gaps between students of color and white students.

Figure 31. Cohort 2 Math Credit Attainment for Students of Color



Similar to both Cohort 1 and Cohort 2, there were no significant difference between Cohort 3 TechSmart students of color and all other students in 6th or 7th grade math credit attainment, as shown in Figure 32. These results are promising as they provide evidence of a closed achievement gap between students of color and white students for Cohort 3.

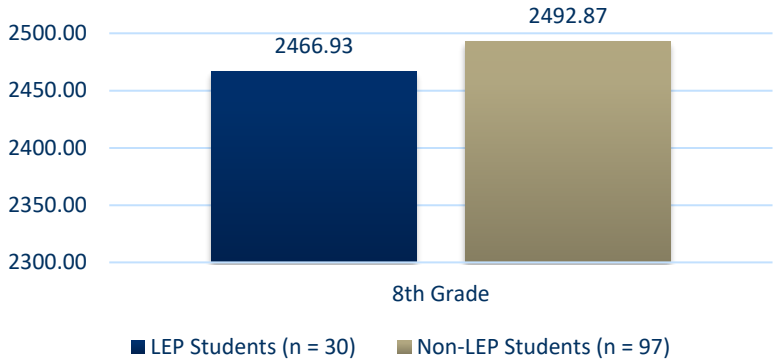
Figure 32. Cohort 3 Math Credit Attainment for Students of Color



Smarter Balanced Math Assessment

Figures 33 through 35, below, show comparisons of Smarter Balanced math assessment scores for

Figure 33. Cohort 1 Smarter Balanced Math Assessment Scores for LEP Subgroup



students from at-risk subgroups and all other students. Although LEP students (shown in Figure 33) had lower average scores on the Smarter Balanced math assessment than non-LEP students, the difference was not statistically significant. Similar results were found when comparing of SPED and non-SPED students (shown in Figure 34) and when comparing students of color and all other students (shown in Figure 35). While SPED students and students of color showed lower average scores than their counterparts, the differences were not statistically significant. These results indicate strong promise for closing the achievement gap.

Figure 34. Cohort 1 Smarter Balanced Math Assessment Scores for SPED Subgroup

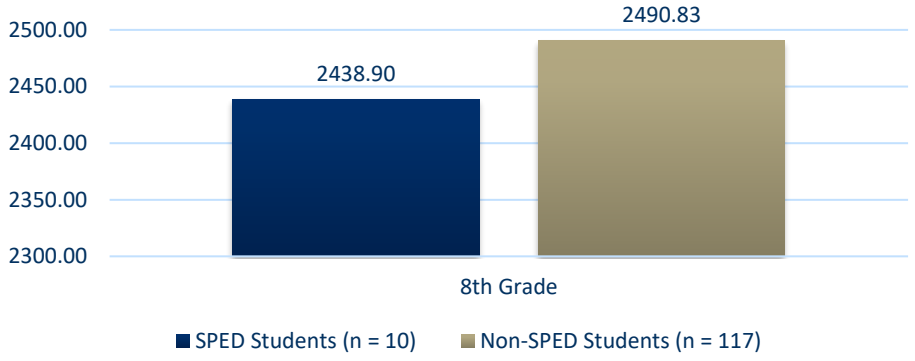
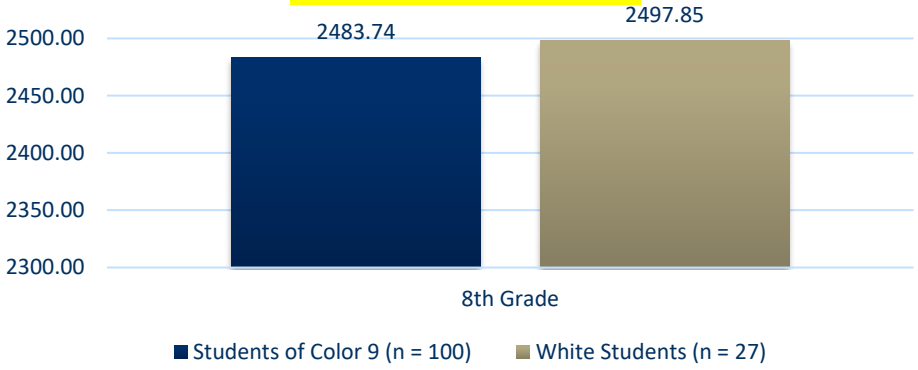


Figure 35. Cohort 1 Smarter Balanced Math Assessment Scores for Students of Color



Digital Age Learning Culture

Districts embrace a cultural shift and view technology as positive.

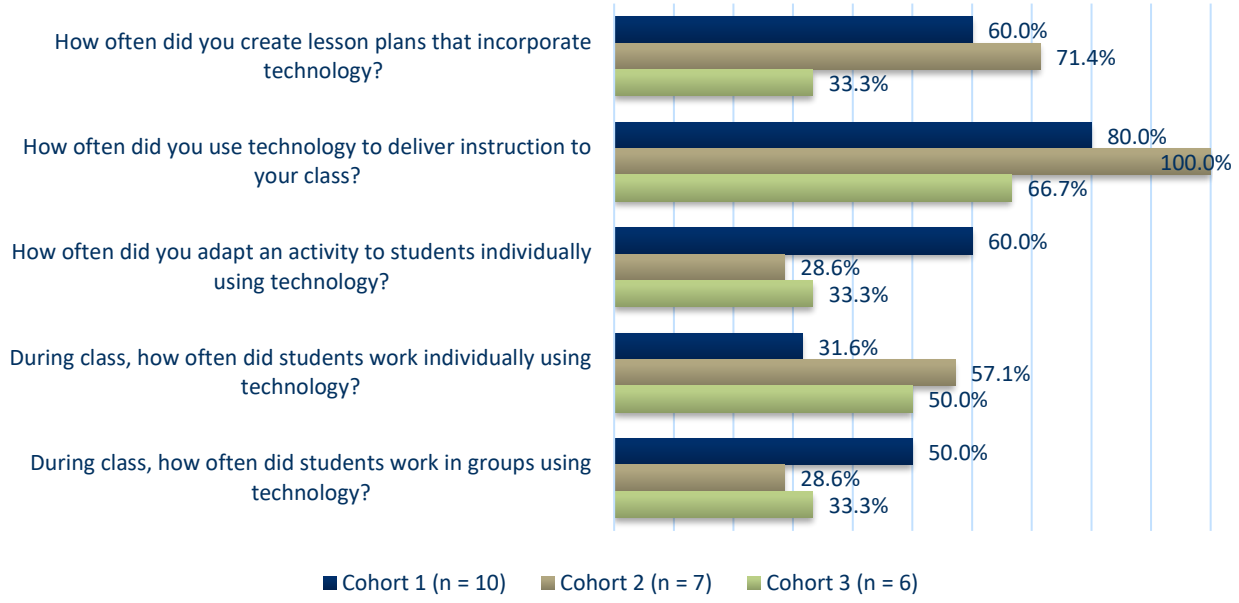
Has the use of technology to support instructional practices increased?

Section Highlights:

Teacher survey results provide evidence of a variety of levels of technology use across cohorts. While over 85% of Cohort 2 and 70% of Cohort 1 teachers reported that they use digital content and resources in their instruction regularly, only 40% of Cohort 3 teachers indicated regular use.

Figure 36 illustrates the frequency of technology integration at the end of the school year across all three cohorts. Cohort 2 showed the highest frequency of creating lesson plans that incorporate technology, using technology to deliver instruction, and using technology for individual student work. Cohort 1 showed the highest frequency of adapting activities to students individually using technology and using technology for student group work. Cohort 3 scores were notably lower than scores for both Cohort 1 and Cohort 2 regarding frequency with which teachers created lesson plans that incorporate technology, with only two of the six participating Cohort 3 teachers indicating they created lesson plans with technology either "a moderate amount" or "a great deal."

Figure 36. Reynolds Frequency of Technology Integration
(% A Moderate Amount/A Great Deal)



The year-end status report stated that there was no notable shift in technology instruction during SY 18-19, which represents the fourth year of TechSmart implementation.

Is the learning management system useful for identifying effective instructional practices (more efficient, easier, data driven)?

Section Highlights:

Evaluation results show that the Schoology learning management system adopted by RSD continues to be useful for collection of assignments, tracking student data, and facilitating communication and feedback between teachers and students. To address obstacles regarding administering online assessments via the learning management system and avoiding student misconduct, RSD piloted Respondus LockDown Browser during SY 18-19.

As reported in previous RSD TechSmart evaluation reports, before the implementation of the grant, RSD piloted a free, limited version of Schoology and adopted it districtwide starting in SY 15-16. Throughout TechSmart implementation, RSD has continued to use Schoology. According to the year-end report, for the period of January 1 to June 30, 2019, part of which reflects summer break, there were over 50,000 student submissions across Schoology use in the district—a number that is in line with previous application of Schoology in RSD throughout TechSmart implementation. The year-end status report also noted that use of Schoology is facilitating RSD's ability to extend the reach of TechSmart across a wider range of grade levels and content areas. In particular, the year-end status report provided an example of elementary curriculum leadership implementing literacy curriculum assessments through Schoology. The use of Schoology is supporting alignment across grades and buildings within the district.

As reported in the SY 17-18 evaluation report, RSD sought out a lockdown browser to implement standardized assessments while preventing students from accessing other websites or applications once they had begun an assessment. The district followed up on their SY 17-18 progress toward this goal by conducting a trial of Respondus LockDown Browser in fall 2018. The browser will be used while administering common assessments through Schoology, allowing structured testing environments similar to state testing and easy access to assessment data.

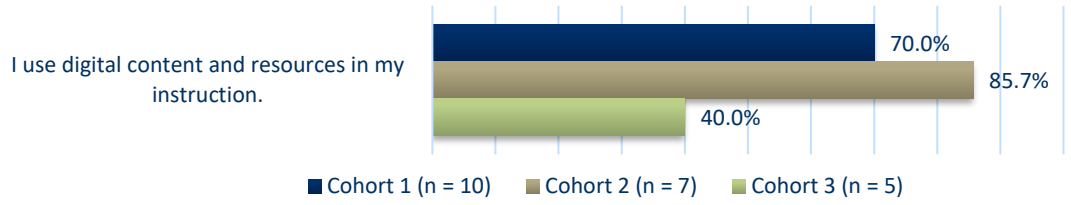
Do teachers have increased access to and use of digital content and resources?

Section Highlights:

Teacher and student survey data provided evidence of continued use of and access to digital content and resources. Cohort 1 and Cohort 2 teachers indicated higher levels of digital content/resource use and access in their classrooms than Cohort 3 teachers. Many students indicated desire to continue working with laptops, while others described desire to work with tablets, phones, specific applications/websites, and music/headphones.

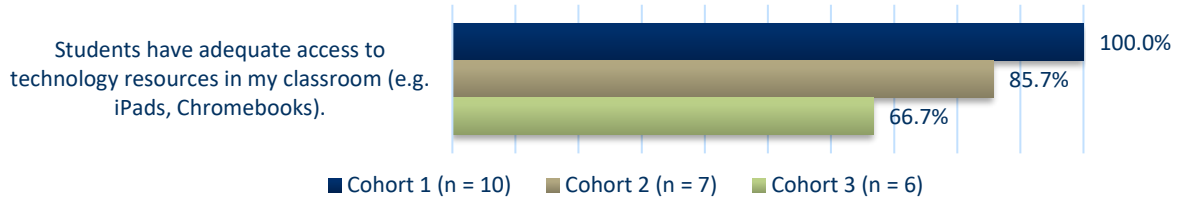
On the teacher survey, teachers reported their use of digital content and resources. Responses are shown in Figure 37. A total of 70.0% of Cohort 1 teachers, 85.7% of Cohort 2 teachers, and 40.0% of Cohort 3 teachers indicated they use digital content or resources in their instruction either "a moderate amount" or "a great deal."

Figure 37. Reynolds Teachers' Use of Digital Content and Resources
(% A Moderate Amount/A Great Deal)



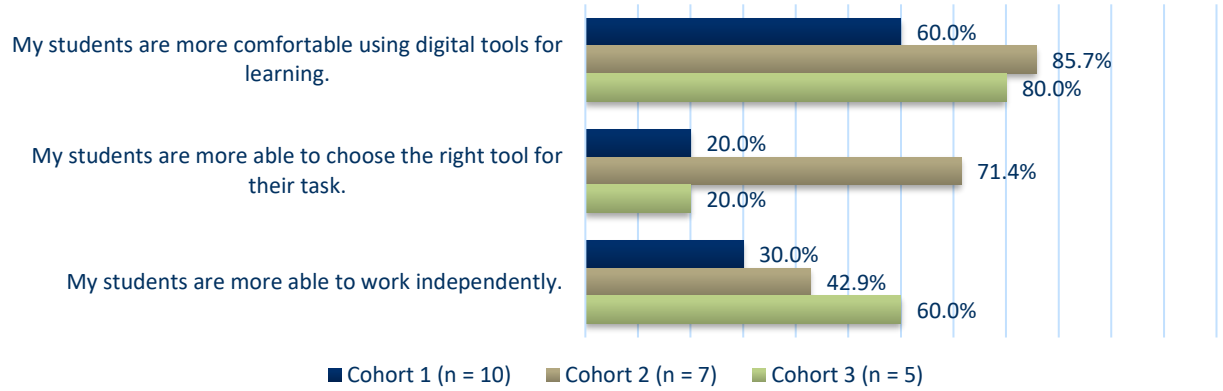
Teachers also reported students' access to technology resources, shown in Figure 38. At the end of SY 18-19, a total of 100.0% of Cohort 1 teachers reported that students have adequate access to technology resources in their classrooms, up from 62.5% at the end of SY 17-18. A total of 85.7% of Cohort 2 teachers reported adequate access at the end of SY 18-19, down from 100.0% the end of the previous year. Lastly, 66.7% of Cohort 3 teachers reported adequate access at the end of SY 18-19.

Figure 38. Reynolds Students' Access to Technology Resources
(% True of Me/Very True of Me)



Finally, teachers were asked to rate a series of statements comparing their current students to those during their previous year of teaching. As shown in Figure 39, the majority of teachers from Cohort 1 (60.0%), Cohort 2 (85.7%), and Cohort 3 (80.0%) indicated their students in SY 18-19 are more comfortable using digital tools for learning. However, when it came to whether students are more able to choose the right tool for their task and able to work independently, results were mixed.

Figure 39. Reynolds Year-End Student Technology
(% Agree/Strongly Agree)



Students had the opportunity to provide suggestions for devices that they wish their teachers would use. Many students (n = 280) mentioned that they would like continued or increased use of laptops. Others described desire to work with tablets or iPads (n = 85), phones (n = 50), specific applications or websites

(n = 34), or music/headphones (n = 11). Example quotes from students for each category are included in Table 23.

Table 23. Technology Students Wish Teachers Would Use

Theme	Sample Quotes
Laptops/Computers (n = 280)	• *"Well I would use a computer to do math or other subjects. Computer helps me type faster and makes me complete my task faster than on paper."* • *"I think that they should use computers more. This could help us to find more sources to help us understand something if we can't understand what's being taught."* • *"I think my teachers should use laptops because it is easier to type stuff. This would help us in school because most kids have a hard time focusing when the teacher is the one giving the instructions."*
Tablets/iPads (n = 85)	• *"The use of iPads could be beneficial because computers are just really slow and bulky. The iPads would just be an easier platform to navigate."* • *"Probably a tablet with a protective case since its smaller and easier to handle but also I like technology with keyboards for typing."* • *"I wish they would let us use tablets because then it would always be touchscreen."*
Phones (n = 50)	• *"I wish we could use our phones or bring our laptops to class. I think that would help a lot because I feel more comfortable using my things rather than the school's."* • *"Phone, it helps because it's a faster way to find information."* • *"Our phones because kids are more familiar with that type of technology and almost everyone can use a phone or iPad."*
Applications and Websites (n = 34)	• *"IXL, because it helps me learn about thing that I don't know or the same thing that were learning about."* • *"Kahoot, it is a very good review tool and you can go back and review incorrect answers."* • *"If we used Google classroom it would be better because it has a mobile friendly app that makes it quick and easy to use. Not to mention Google will send notifications to your email when you receive new assignments."* • *"Actually, I like the way we use Venues to create our own calculators and seeing how apps like Excel can help us. It makes math a lot easier. I also like how we are given some videos to watch to better understand a unit before being taught the traditional way."*
Music/Headphones (n = 11)	• *"Better headphones because the ones here hurt our ears or don't work."* • *"I believe that we should use more headphones so people won't get distracted by noises."* • *"If I could have my phone out to listen to music while I work I could focus more, than being distracted by other people talking around me."*

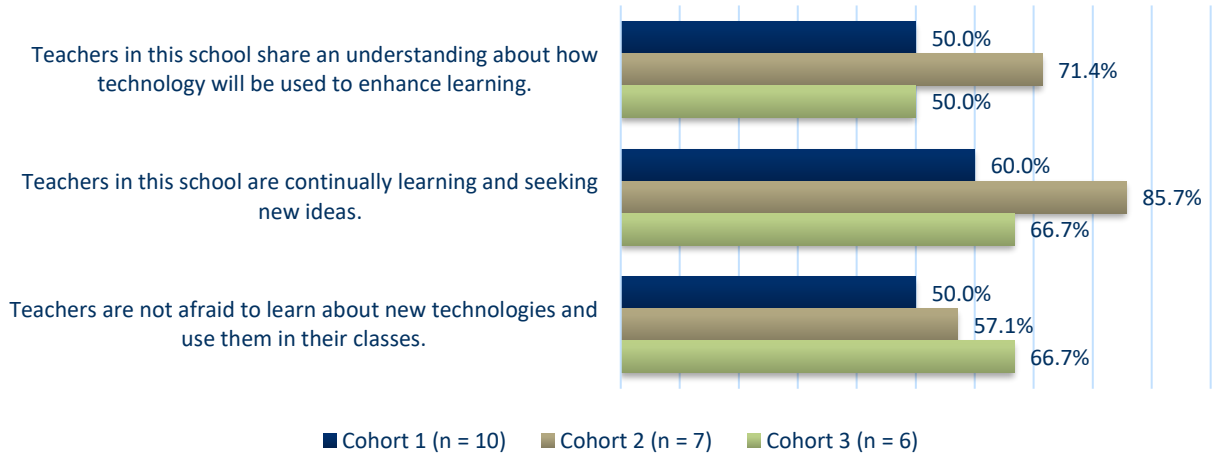
Is there evidence of district wide support for technology integration?

Section Highlights:

Results surrounding the district's culture of support for technology integration were mixed. Culture seemed to improve from previous years for Cohort 1 teachers, but diminished somewhat for Cohort 2 teachers. Interview responses indicated mixed, but largely positive, experiences around culture in RSD.

During the year-end teacher survey, teachers indicated their level of agreement with three statements about culture of support for technology among teachers at RSD. Results are shown in Figure 40. At least half of all teachers across all cohorts indicated they agreed or strongly agreed with each of the three statements. Cohort 1 teacher agreement shifted noticeably from the end of SY 17-18 to the end of SY 18-19, as agreement increased for each question. Cohort 2 teacher agreement decreased somewhat from SY 17-18 to SY 18-19. In general, by the end of SY 18-19, Cohort 2 teachers indicated the most positive culture of support, while Cohort 1 teachers indicated the most negative culture of support among all three cohorts.

Figure 40. Reynolds Teacher Perceptions of a Culture of Support for Technology Integration
(% Agree/Strongly Agree)



Qualitative data from interviews indicated similarly mixed experiences with school culture around technology. One teacher commented on why there may be discrepancies in feeling supported. When asked whether there is a culture of support around technology at their school, the teacher shared:

> *In theory, yes. In practice, we don't really give teachers that much additional training or any additional support with regards to technology. There are teachers that don't know how to do basic functions with technology, so many times students have more experience with technology than teachers do. The teachers can be reluctant to change, or have a fear of technology. We could do a lot better as a district, as a staff, so that we all feel comfortable with technology. We should be skilled enough that we can implement technology where we see it fit the student well.*

Other teachers indicated that the physical technology resources provided, and the PD opportunities received were enough for them to feel supported. One teacher said, "Yes, there is a culture of support. More and more teachers are being able to have the classroom sets of computers. We've got many teachers on staff who are available and willing to help with like glitches and issues. Our evaluations are all done online now, so things are moving towards the ideal of paperless." Another teacher said, "Some teachers just aren't interested in using technology, and I think that's fine. Certainly, the administration is supportive of using it, and some of us have chosen to group together in our professional learning communities and talk about using technology in the classroom. That's been helpful. That's sort of on our own, not necessarily from the district."

Following the SY 17-18 evaluation report, which found that there may be less promise in the culture of support for technology in Cohort 1, we asked Cohort 1 teachers to elaborate on culture. They generally indicated that being in Cohort 1 required more work and effort because Cohort 1 teachers were relied upon heavily by later cohorts. However, there was also a sense of pride in having helped build the program and enjoyment of sharing with other teachers. One Cohort 1 teacher said:

I definitely feel like there's more work on Cohort 1 because we were the groundbreakers and there wasn't really anybody in the building to go to other than the people in our Cohort 1 group. If people in the group didn't know how to help you, then you were kind of stuck, and that's when you had relied on a coach. I felt like I was creating new things and I was out on the leading edge. People would come to me and my group and ask for help.

Now, I feel like the people who've come on board since then know to come ask us for help with the little things that there wasn't anyone to tell us in Cohort 1. So, yeah, I could see how in the past they would say there was more work on the Cohort 1 people. There was no one in front of Cohort 1 to offer help. Just like anything that's starting new, you kind of make it up as you go, and then you learn from what you've done and you can pass that on and get better next time.

Leaders reinforced the idea that TechSmart implementation has helped change the culture around support for technology integration. One leader said, "I can't say enough about how these last four years have grounded our purpose, have advanced us forward faster than we would have without it, have reenergized teachers, have increased student engagement and relevance, have enhanced pride and purpose, and have shifted the culture here to the 21st century. It's been immense. Teachers' capacity to take on new risks and try things that are more culturally relevant for students is empowered when they have technology at their disposal instead of traditional, outdated textbooks. It's opened up the creativity around what teachers can do now that they weren't able to do without the technology and the training to use it."

Do parents have an increased understanding and utilization of districts' technology assets?

Section Highlights:

Interview responses indicated that teachers continue to interact with parents in much the same way as prior to grant participation, with most communication occurring via email. One teacher indicated that they used technology during parent conferences, and another indicated that parents can access math program work online from home. RSD has shifted their parent engagement focus to other non-technology topics.

Some teachers provided examples of how they are utilizing technology to engage parents, but the primary means of communication with parents is via email, which remains the same since before the grant. One teacher shared, "I use email. Some of my materials are digital, so I can send that to parents when students are out. Also, if a parent wants to refute something that happened, I can screenshot it or take a picture of it and send it in an email. That's all I use it for in terms of parent communication."

One exception to email use was a teacher who described efforts to use technology during conferences with parents and using the program IXL. They said, "At conferences, students were able to share their book online. I also am using technology with IXL, a math program. The parents have access to that, and the kids can practice at home."

The year-end status report described how parent engagement activities have shifted away from focus on technology, toward focus on new restorative justice initiatives and efforts to reduce chronic absenteeism.

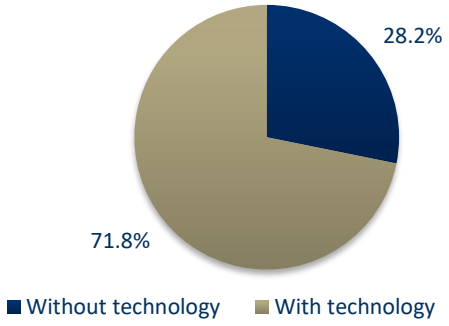
Are an increased number of students utilizing and engaging with new technology?

Section Highlights:

Consistent with all previous evaluations, about three-quarters of students would prefer to complete an assignment with technology.

As mentioned in previous sections, student engagement seems to have increased as technology has been incorporated more frequently in RSD classrooms. Figure 41 shows student responses to a question about whether they would prefer to complete an assignment with or without technology. Nearly three-quarters of participating students would prefer to complete an assignment with technology than without, consistent with the student response from the SY 15-16, SY 16-17, and SY 17-18 evaluations.

Figure 41. Reynolds School District Student Assignment Completion Preference (n = 912)



Visible Leadership

District leadership is actively involved and working with key communities to accomplish change.

Are districts identifying effective instructional practices and disseminating information and results to other districts?

Section Highlights:

RSD has continued to disseminate information about their experiences and share best practices with other East County school districts. Participation in collaborative groups, as well as invitations to have members of other districts visit RSD classrooms, were both indicated to be helpful opportunities to share with other districts.

Principals, the IT TOSA, and other district leaders indicated that they have been collaborating with other East County TechSmart Districts (i.e., Gresham Barlow, Centennial, and David Douglas) to share the way they are integrating grant-funded technology into the classroom. Leadership shared that the MHCRC meetings and East County Tech Consortium meetings have both been valuable opportunities to share and learn from other districts. One district leader commented, "The MHCRC collaborative where all the districts get together has been a great opportunity to share what we've been doing the last two years. We've also had two other districts that have reached out to us that are a little bit newer in their implementation of their grant, and they've done some site visits to us and observed in our classrooms and talked to us at the district level, the teacher level, and our staff that help support the grant around just what the structure looks like. So yes, we have definitely been able to share."

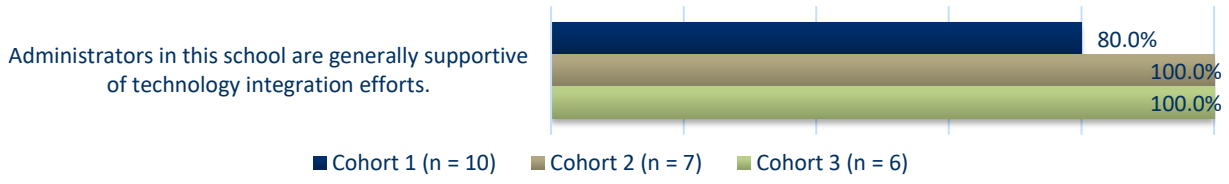
Do teachers feel increased support from district leaders regarding technology integration?

Section Highlights:

By the end of SY 18-19, 80% of Cohort 1 teachers and 100% of Cohort 2 and Cohort 3 teachers indicated that administrators were generally supportive of technology integration efforts. Teachers commented during interviews on support received from administration. Responses were somewhat mixed, but most teachers seemed to feel supported by the district, above and beyond support for grant-specific initiatives.

Results from teacher survey responses regarding administrative support are shown in Figure 42. By the end of the fourth year of implementation, 80.0% of Cohort 1 teachers and 100.0% of both Cohort 2 and Cohort 3 teachers agreed or strongly agreed that administrators support technology integration efforts.

Figure 42. Perception of Administrators' Support of Technology Integration
(%Agree/Strongly Agree)



During interviews, responses about support from the district level were more mixed. Most teachers indicated that support had been confined to the specific provisions of the grant. One teacher said, "We have received support through the PD that we've had. Our tech coach is available if we want the help. That's about it. The IT department helps us with technical difficulties."

Some teachers indicated broader support, such as one teacher who shared:

They've been very supportive of our meetings, making sure that we felt like we were supported and that meetings were scheduled at the right time. They've been super supportive about the space and about allowing us to have the space that we need, even when other groups might have wanted the space. They gave us priority. And then of course with training for them to make sure that we had experts training us was a lot of support too.

Another teacher indicated that the support they received was through their ability to try new instructional strategies without fear of backlash, but that perhaps other teachers did not feel the same level of support. The teacher shared:

I'm doing what I feel is right. It might not work, but I have the freedom and the backing to make some of these decisions about things that I want to try in my classroom. And my principal has been very supportive of that. I don't know that everybody feels as comfortable in their position as I do. It might help to make it clear that hey, we're giving you this technology. We want you to do what you think is best and we know that sometimes things work and sometimes they don't. Voicing those things from the beginning would probably give people freedom.

I know that we've talked about in different PDs. If you're in a group classroom where kids are talking to each other about math or whatever, it's going to be loud. It's going to look crazy. If people just walk through your room, they might say, "Hey, what's going on in there?" versus a bunch of kids sitting in rows and everything is quiet. You really don't know which one of those classrooms has more math learning happening. But if we want to try new approaches, people need to feel that they're not going to be looked down upon or reprimanded if their classroom looks different. I've never felt that way and I've never felt that way from any of my bosses, but I know that other people do worry about what other people think.

When asked what type of support the district has provided, another teacher indicated they had not received a lot of support outside of grant-specific efforts, but shared information about a new grant, indicating that perhaps one way the district has provided support is by finding additional funding sources to continue to expand the efforts that began during TechSmart. The teacher said, "I haven't received too much support outside of what the grant provides. Have you heard anything about the Verizon grant? That's what the district wants to do to make sure every student has technology. That's going to supplement the non-math classrooms and help every student have an iPad that they can take home."

Data Driven Improvement

Current, relevant, and high-quality data from multiple sources are used to improve schools, instruction, professional development, and other systems.

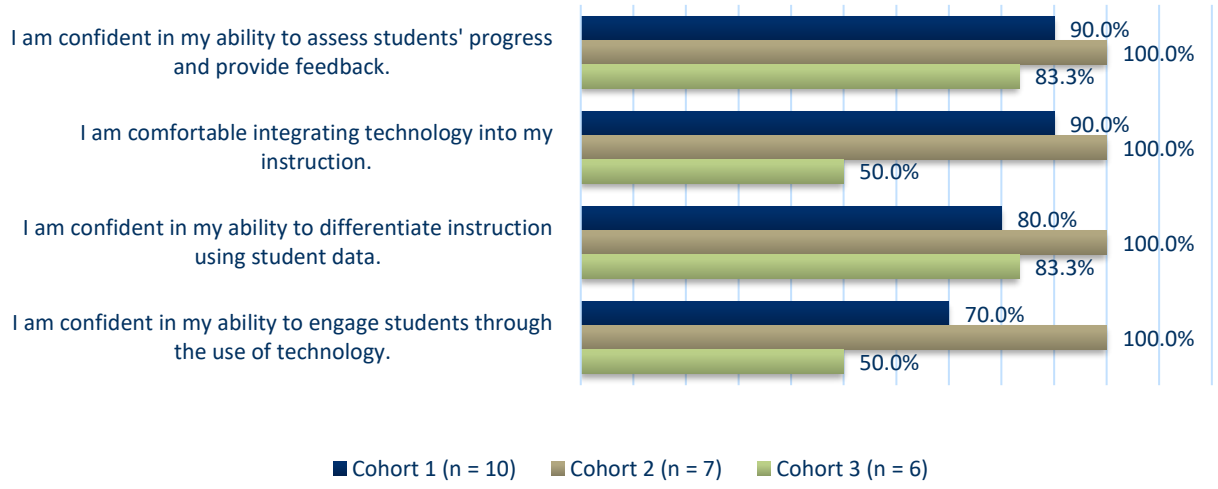
How are schools using data to improve instruction, professional development, and student performance?

Section Highlights:

Survey responses indicated that Cohort 2 teachers feel the highest confidence and comfort using data and technology in their instruction, while Cohort 3 teachers feel the lowest confidence and comfort. Interview responses showed that teachers are using formative assessments in their instruction with a variety of tools, including Kahoot, IXL, and Schoology.

Teacher surveys asked teachers to reflect on their agreement with a series of statements about data-driven instruction. Figure 43 shows responses. While 100.0% of Cohort 2 teachers agreed or strongly agreed with all four statements about their confidence and comfort with using data and technology in instruction, agreement was somewhat lower in Cohort 1 and was lowest in Cohort 3.

Figure 43. Reynolds Data-Driven Improvement
(% Agree/Strongly Agree)



An additional survey question asked teachers to report the extent to which they are using formative assessments. At the end of SY 18-19, 70.0% of Cohort 1 teachers, 57.1% of Cohort 2 teachers, and 40.0% of Cohort 3 teachers indicated they use formative assessments to identify effective instructional practices "a moderate amount" or "a great deal."

During interviews, all participating teachers indicated they use formative assessments in their instruction. Teachers mentioned several specific tools they use for formative assessments. One teacher said, "Kahoot is something we do a quiz with. I like doing things like that to give me a quick snapshot of how the class

is doing. We use that to review and practice. Then if I see the class didn't do well on certain questions, we go over it again. It does change my instruction, but it also gives them quick feedback about how they're doing. And it's anonymous, so they get to see that oh, the class really isn't that strong in a particular topic. And they get to see where they fell personally, if they're on the right track or not." Another teacher said, "We do assessments that I'll put up on Schoology or through IXL. Any time they're working on that, I'll be circulating the room but also watching my home screen and seeing which students are needing help. I can go sit down with them and help them with whatever it is they're not understanding."

Funding & Budget

District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.

Have districts identified at least one opportunity for repurposing resources to support technology integration?

Section Highlights:

While there was no notable repurposing of resources during SY 18-19, RSD shifted perspectives toward sustaining and scaling up efforts initiated during TechSmart implementation, including seeking out additional related grant opportunities to continue their efforts.

Overall, leaders indicated that there was not any substantial repurposing of resources during SY 18-19, due to the late stage of grant implementation (year four of four). One leader said, "As we see this grant out, most of those shifts in practice and investment have been at the start of the grant cycle—not so much here at the end."

Despite lack of repurposed resources during the fourth year of implementation, the district has sought out additional funding related to its TechSmart goals and successes. One district leader shared additional information about grants that RSD has applied for or received to follow up on TechSmart efforts and continue to sustain and scale the efforts over coming years, saying:

We're into year four of four in our implementation, so it's about sustainability at this point and deepening the engagement of teachers in their professional development effort. That includes our instructional coach, who does small group and individual consults with teachers in the math department. On a larger scale, the effectiveness, as we perceive it, of our implementation was absolutely the vehicle for us to be eligible for other technology grant investments, which we pursued and secured. We're replicating the effort of TechSmart through investments from the Verizon and Springboard organizations, who have seen the value of what we've accomplished and seek to build upon it.

Strategic Planning

District strategic plan reflects shared commitment to improving outcomes for students.

Does the district's strategic plan reflect shared commitment to improving outcomes for students?

Section Highlights:

SY 17-18 evaluation results point to RSD's steady commitment to improving outcomes for students and recognizes student access to technology as an important piece of this. RSD administrators described the way the district's strategic plan lines up with the goals of the TechSmart grant, and how they are leveraging MHCRC funds in order to advance thoughtful technology implementation in their district.

During interviews, district leaders described how TechSmart has aligned with and furthered the district's strategic plan. One leader described how TechSmart has facilitated the district's efforts to work toward equity in access to technology, sharing:

> *Part of our strategic plan right now is looking at what some of us call "techquity." We rolled out TechSmart with our grades 6-9 math, and our math department was very excited about that, but now it has lit the fire for other departments and other teachers to want to experiment with technology, and it set us up for moving more technology into our schools. Beforehand, teachers may not have been ready for it and wanted it as much, but now that they've seen it in action and heard about it over the last four years, people are very much ready for that technology in the classroom.*
>
> *It has set us up for being able to move forward with some other grants. It has helped us look at the way we teach and conduct professional development. It fits really well into our strategic plan of providing access for all students. The majority of our students in our district are or have been at one time English-language learners. We have a high poverty rate, so a lot of our students just don't have the access, and this has set us up well for being able to provide students with access to technology, not only while they're at school, but outside of school too.*

Other leaders echoed this sentiment and expressed that TechSmart has aligned with the district's focus on preparing students for the future. One leader shared, "A mission of the Reynolds School District is something along the lines of preparing students for a world yet to be imagined. In that context, it's developing students to be competent and comfortable in 21st century workplace. Learning relies heavily upon their ability to be technologically savvy and competent in a range of technology programs and devices."

Engaged Communities & Partners

Parents, stakeholders, community groups and others are actively and systemically involved in helping students develop, learn, and achieve.

Do district leaders demonstrate increased communication with and among outside stakeholders regarding technology integration?

Section Highlights:

No specific efforts to increase communication with the outside community were noted during the SY 18-19 evaluation, but the district is engaged in efforts to share results with other districts and to expand technology integration through work with additional community funding sources.

Beyond efforts to share best practices and results with other districts, as described in previous sections of the SY 18-19 evaluation report, RSD leaders did not indicate any efforts to increase communication with and among outside stakeholders. However, as described in previous sections, the district has sought out additional funding opportunities to continue and expand their efforts surrounding technology integration.

Evaluation Insights

The SY 18-19 evaluation at RSD produced the following insights:

- Student achievement results from the SY 18-19 evaluation were more mixed than in past years. In general, 7th grade math and overall credit attainment seemed to be higher in treatment cohorts than the historical Comparison Group, but 8th and 9th grade credit attainment outcomes were not as promising. Smarter Balanced math assessment data did not indicate promise of improved academic outcomes for Cohort 1 8th grade scores (the only scores available for the SY 18-19 report).
- For students from at-risk subgroups, results were promising. Math credit attainment was greater for LEP than non-LEP students in Cohort 1 and Cohort 2. There were no significant differences in math credit attainment for SPED students and students of color providing promising evidence of a closed achievement gap between the two groups. There were no significant differences between SBAC scores of student subgroups vs. majority groups within Cohort 1, also showing promise for a small achievement gap. Qualitative data indicated that teachers and leaders both feel that technology use is benefiting those students who are English language learners or have an IEP substantially.
- The culture at RSD seems to generally support technology use. Teachers reported feeling largely supported by administrators, with freedom to try new approaches without fear of being reprimanded.
- Teachers had mixed opinions about the PD model, but perceptions seemed generally positive. Some teachers took on leadership roles with the PD model and seemed to both enjoy providing helpful guidance to other teachers and feel somewhat stressed by the added workload. Almost all teachers received at least one hour of group PD, with the majority of teachers reporting 17 or more hours of group PD. Individualized PD was much more limited, with most teachers reporting 0 to 8 hours of individualized PD. Cohort 2 teachers seemed to find the PD most useful and effective, across both survey and interview responses.
- Results from the student survey showed that students are largely happy with the use of technology in classrooms. Some students expressed desire for even more technology use, while others expressed preference for non-technology-based teaching strategies, but the average student response was neutral or positive. Those students who expressed positive opinions of technology shared how technology benefits their learning and retention, is fun to use, helps students focus, and increases convenience and efficiency. Those students who expressed negative opinions of technology generally preferred previous modes of instruction or felt distracted during technology use or had a difficult time using devices.
- Teachers seem to be feeling comfortable and confident using technology in their instruction, even when instructional strategies have not changed dramatically. All teachers rated their technology skill levels as Level 3 or higher on a scale ranging from Level 1 to Level 5. Teachers reported using a variety of tools and techniques in the classroom that make use of technology, and use of technology was confirmed in walk-through observations. In all three cohorts, teachers frequently reported use of technology for engaging students in learning and for planning and preparation.

Project Summary

Gresham-Barlow School District (GBSD) launched implementation of its MHCRC TechSmart grant during the 2016-2017 school year (SY 16-17). Focusing on kindergarten through third grade classes at North Gresham Grade School and Kelly Creek Elementary School, GBSD's grant aims to reduce gaps in literacy achievement, specifically for students of color, English Language Development (ELD) students, students with disabilities, and students living in poverty. GBSD recently completed its third of four years of implementation, which includes full-time, onsite coaching from an Instructional Technology Coach (ITC) at each school, coupled with other PD opportunities and classroom technology supports. GBSD intends to use results from the two pilot schools to support efforts to scale literacy instructional strategies and practices across the full district with a well-vetted plan, systems, and resources. GBSD's progress during the 2018-2019 school year (SY 18-19) is presented below, organized according to the seven essential factors for effective transformation to a technology-rich teaching and learning environment.

Methods

A general description of TechSmart evaluation methods is included in the introduction to the full report. Data collection efforts for SY 18-19 in Gresham-Barlow School District are summarized below.

Teacher Survey

PRE designed a survey that was administered online to teachers in September of 2018 and May of 2019. Twenty-seven teachers completed the beginning of year survey and twenty-two teachers completed the year-end survey.

Teacher Interviews

PRE conducted phone interviews with one teacher from Kelly Creek Elementary School and two teachers from North Gresham Elementary School.

District Leader Interviews

PRE conducted phone interviews in spring 2019 with four district leaders: the Director of Teaching and Learning, the Kelly Creek Principal and ITC, and the North Gresham ITC.

Leader Survey and Rubric

Leader ratings of teachers' use of technology come from two data sources. First, a leadership observation form was completed by the North Gresham and Kelly Creek ITCs and includes first-time observations of two North Gresham teachers and three Kelly Creek teachers. Second, a leader survey was completed by one principal. Leader ratings from both sources were combined for a total of six ratings of teachers.

Student Achievement Data

The impact of the TechSmart grant continues to be assessed using a quasi-experimental comparison group design. The Treatment Group thus far contains two cohorts: students who were kindergartners in SY 16-17 at Kelly Creek and North Gresham (Cohort 1) and students who were kindergarteners in SY 17-18 at Kelly Creek and North Gresham (Cohort 2). The Comparison Group is made up of students who were kindergartners in SY 16-17 at Highland and Powell Valley. All Treatment Group cohorts are compared to the same Comparison Group. The two comparison schools were chosen to be the most well-matched to Kelly Creek and North Gresham in terms of student composition and achievement. As additional data

become available, additional Treatment Group cohorts will continue to be added. Outcomes include ELPA and DIBELS scores for SY 18-19, similar to the SY 17-18 report.

DIBELS assessment data are collected to inform teachers about their students' odds of achieving particular literacy outcomes. According to researchers from the University of Oregon, reviewing these outcomes is an important step in the Outcomes Driven Model of early literacy problem solving.[1] This model uses assessments like DIBELS as part of a feedback loop that operates within each classroom each year, serving as a tool for teachers to reevaluate their lesson plans and strategies. For this reason, the assessment is not intended to compare students from year to year. While examining students' DIBELS scores next to those of the Comparison Cohort gives a general picture of where students stand in their early literacy skills, these outcomes cannot establish a causal relationship between technology integration and literacy outcomes.

A goal of the TechSmart Initiative is to reduce the achievement gap by improving outcomes for three "student subgroups": LEP learners, Special Education students, and students of color. The TechSmart Initiative Logic Model uses "Common Criteria" to identify promising and effective instructional strategies and practices. The criteria include, among others:

- Promote progress for all student subgroups in achieving outcomes. (Promising)
- Indicate promise as a means of closing the achievement gap. (Promising)
- Correlate with measurable improvement for a student cohort in an AHR academic outcome area. (Effective)
- Be validated in multiple settings and with additional student cohorts. (Effective)
- Indicate evidence of reducing the achievement gap among student subgroups. (Effective)

To assess achievement gap reduction, student outcomes for each subgroup are examined over time for Treatment Group cohorts and the Comparison Group. Table 1 details the numbers of students in the Treatment Group cohorts and the Comparison Group by year. Sample sizes in Table 1 are based on availability of DIBELS data.

Table 1. Treatment Group Cohorts and Comparison Group Sample Sizes

Cohort 1		Cohort 2		Comparison Group	
Year	**N**	**Year**	**N**	**Year**	**N**
2016-17 (K)	158	**2017-18 (K)**	149	**2016-17 (K)**	155
2017-18 (1st)	136	**2018-19 (1st)**	114	**2017-18 (1st)**	127
2018-19 (2nd)	115			**2018-19 (2nd)**	110

Figure 1 presents each cohort by subgroup, with students categorized based on subgroup affiliation in kindergarten. The Comparison Group and Cohort 2 of the Treatment Group showed somewhat higher rates of limited English proficiency students than Cohort 1 of the Treatment Group. The Comparison Group and Cohort 1 of the Treatment Group showed somewhat higher rates of students in special education and students of color than Cohort 2 of the Treatment Group.

[1] Good, R. H., Kaminski, R. A., Smith, S., Simmons, D., Kame'enui, E., & Wallin, J. (In press). Reviewing outcomes: Using DIBELS to evaluate a school's core curriculum and system of additional intervention in kindergarten. In S. R. Vaughn & K. L. Briggs (Eds.), Reading in the classroom: Systems for observing teaching and learning. Baltimore: Paul H. Brookes.

Figure 1. GBSD At-Risk Subgroups

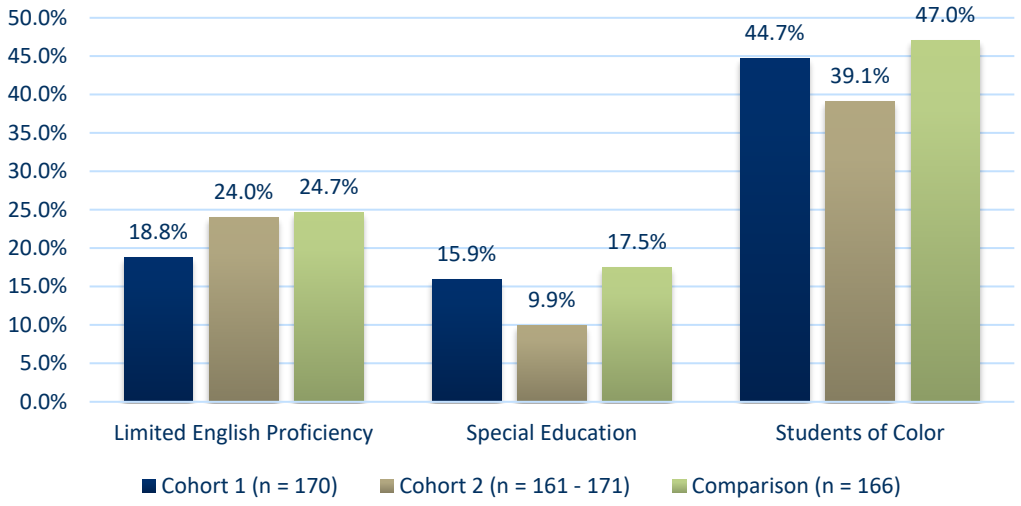
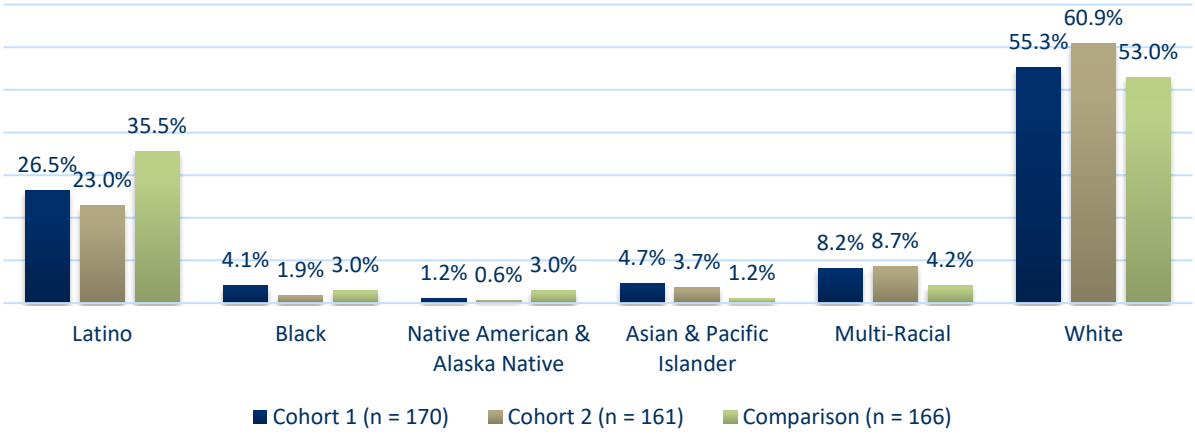


Figure 2 presents each group by race/ethnicity. When compared to the Comparison Group, Cohort 1 and Cohort 2 of the Treatment Group show relatively similar proportions of each race/ethnicity. The largest differences are in the Latino subgroup, which has the highest proportion in the Comparison Group, and the White subgroup, which has the higher proportion in Cohort 2 of the Treatment Group.

Figure 2. GBSD Race/Ethnicity



Findings

The findings from the SY 18-19 evaluation at GBSD are presented below and organized in line with the MHCRC framework, which identifies seven factors that are essential for schools to effectively transform into technology-rich teaching and learning environments.

Teaching Effectiveness

Districts support regular, inclusive and shared professional development among teachers.

GBSD leaders and teachers who participated in phone interviews during the SY 18-19 evaluation identified PD opportunities and practices that ranged from individualized sessions to collaborative inter-district "tech camps" that included participants from GBSD and at least 15 other districts.

Overall, teachers and leaders highlighted a shift in professional development structure and opportunity as the district's progress has advanced, both within the grant and toward overarching technology strategies and goals. According to the year-end annual status report, during SY 18-19, ITCs spent 50% of their time supporting their original pilot school and 50% supporting other elementary schools in the district. Teachers reported a change in availability of ITCs, with coaches being spread across more schools and teachers as the program has moved away from its kickoff. One teacher described this change, saying, "[Our coach] is not as accessible. She's not in our building all the time or most of the time, and it makes it a big challenge if we're trying to do something new. Things that we've already been doing and using are pretty easy to keep going with, but she's very open and wanting to be here when we need her. It's still hard to schedule time because she's got a pretty full schedule." The teacher went on to explain that there were more individual meetings with the ITC in the past year than group PD opportunities. According to the year-end status report, the change in group PD was intentional. The report indicated that whole-group PD has been less effective, as teachers are at different levels of skill and comfort with technology. Instead, GBSD has focused on building relationships with teachers and getting into their classrooms with ITCs.

Individual PD opportunities focused on interactions with part-time, onsite ITCs at each school. The ITC offered one-on-one meetings that teachers indicated were available all year but were especially encouraged toward the beginning and end of SY 18-19. Group PD opportunities included team trainings and workshops—seemingly less frequently than previous years due to availability of ITCs—and Tech Walks. Teachers specifically noted that their classrooms are available for other teachers to visit and that they have been able to share more knowledge with other teachers as their own knowledge and skills have advanced throughout the grant period. One teacher said, "Last week I participated [in a Tech Walk] and went to a couple of schools. I ended up sharing a lot because we're just ahead of everybody and we have one-to-one. When we're with a group of teachers, now we're that school that we went to at the beginning that has all the stuff and is using everything."

Similar to interview reports from SY 17-18, teachers again described the importance of having an ITC that was available to provide support, whether onsite or via email. Teachers emphasized that the ITC's ability to differentiate among teachers' individual needs benefits both teachers and students, as teachers

are able to move at unique rates and students are able to learn together with teachers. Teachers noted willingness and enthusiasm to test out new technology offered by the district and expressed gratitude for ITC support when trying new devices, applications, and instructional strategies. One teacher said, "[The ITC] is encouraging all teachers, not just myself, to participate in a lot of the tech PD that she offers. The one I tap into most is the coaching support, even if she's not in our school. She's always managing my emails, and even if it's not a day that she's supposed to be here, she comes."

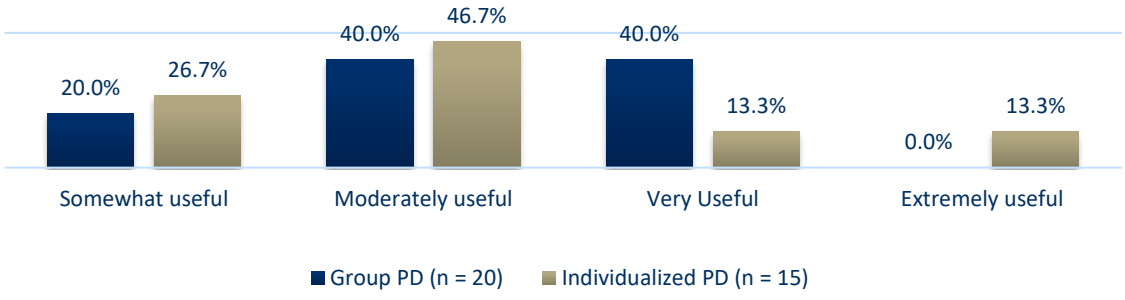
According to the year-end status report, PD opportunities offered outside of typical coaching included: multiple 3-hour professional learning sessions focused on standards and strategies; ITC support during Tier 2 meetings (multi-tiered system of support for students); tech walks within GBSD and at other districts; and Coding in the Classroom workshop and GBSD Week of Code event. Table 2 summarizes the amount of group and individual PD that teachers received by the end of SY 18-19. While teachers reported fewer PD hours in SY 18-19 across all categories, the most substantial change is a reduction in the number of hours teachers reported receiving group PD. In SY 17-18, 80.0% of teachers reported receiving at least nine hours of group PD, while only 22.7% of teachers reported receiving at least nine hours of group PD during SY 18-19.

Table 2. GBSD Hours of PD

Hours of PD	Group PD (n = 22)	Individual PD (n = 22)
0 hours	9.1%	22.7%
1-8 hours	68.2%	59.1%
9–16 hours	13.6%	4.5%
17–32 hours	4.5%	9.1%
33+ hours	4.5%	4.5%

When asked to rate the usefulness of group PD, the majority of teachers indicated group PD was moderately useful (40.0%) or very useful (40.0%). When asked to rate the usefulness of individual PD, most teachers (46.7%) indicated it was moderately useful. When compared with previous data, teachers generally rated both group and individual PD as higher in usefulness in SY 17-18 than in SY 18-19.

Figure 3. GBSD End of Year Teacher Ratings of PD Usefulness



How is professional development impacting teacher instruction?

Section Highlights:

Professional development throughout the first three years of the grant has contributed to an overall increase in technology use from SY 16-17 to SY 18-19, but growth leveled off somewhat in SY 18-19. This evaluation question includes the following outcomes: 1) PD has helped teachers increase the use of technology for evidence-based instructional practices, 2) PD has helped teachers use technology to differentiate instruction, and 3) PD has helped teachers use technology to analyze and use data about student learning. Teacher survey data shows that results for all three outcomes were mixed, with some components of each outcome continuing to improve from SY 17-18 to SY 18-19 and other components regressing to some extent. Interviews support this mix of results, with teachers and leaders reporting great successes in their own classrooms, mixed with some challenges as the district transitions to a focus on sustainability of results and scaling the program.

As described in the methods section, PRE interviewed both teachers and leaders to assess the impact of PD activities on teachers' instruction. Leaders noted that teachers are advancing in their instruction and integration of technology in meaningful ways, especially as they gain experience, skill, and knowledge. The Director of Teaching and Learning described how teachers are advancing:

> *We are starting to see some of those folks really venture farther in the SAMR model, away from replacing an activity with something on a device to really getting more creative and doing coding. And there's no portfolio. There are different ways where they're actually enhancing with the text, not just replacing it. I think their confidence and sophistication with it is growing.*

The survey asked teachers how effective the PD model has been in impacting their instruction. The majority of teachers had positive opinions of the PD model, especially those teachers who reported taking advantage of individual coaching. Several teachers indicated that they received less support during SY 18-19 than previous years, likely due to added responsibilities for ITCs and resulting decreases in ITC availability. One teacher indicated they needed PD less this year than in previous years, presumably due to increases in knowledge, skills, and abilities.

Table 3. Effectiveness of the PD Model at GBSD

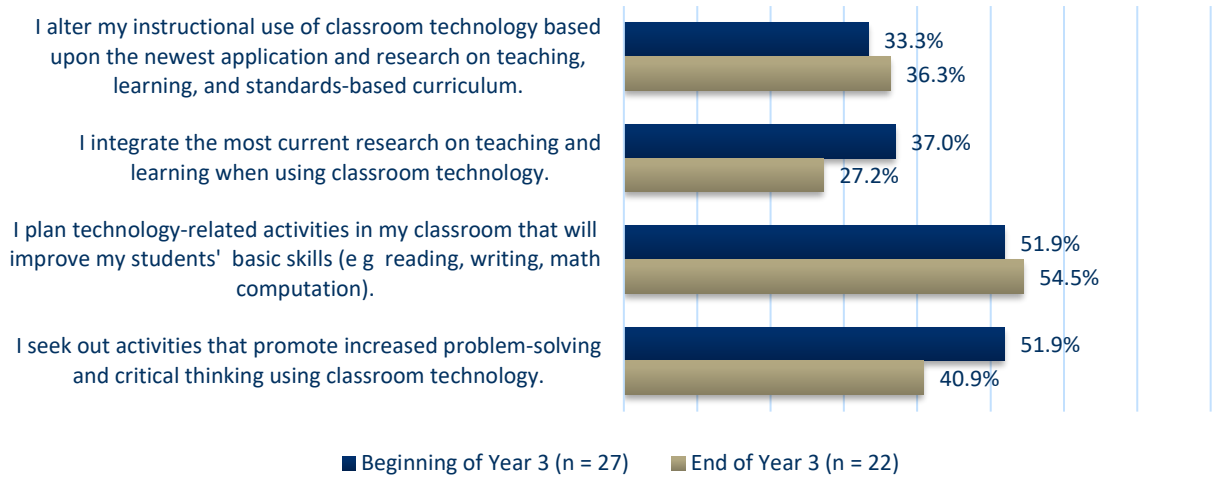
"I enjoy have the tech coaches share new ideas to try. I learned a lot from their coding workshop I went to. I would like to use the coaches more for individual coaching, but that is not their fault, it's mine for not reaching out."
"Having a tech innovation coach has been so helpful. I suggest keeping a coach in any future tech rollout."
"I would like to see ongoing training for teachers so that those new to the building can be up to date, and those of us that are ready to try a new step have that opportunity."

"It has been highly effective, just more so the past two years and quite a bit less this year"
"Have not had any coaching this year to continue to grow in my tech use -- it feels very rudimentary and does not help support differentiation very well as I had hoped that it would."
"Need PD the first year quite a bit. Not so much now."
"Very effective. It allows my students to have daily access to technology experiences in all subject areas. They use it for math and writing daily. They have access to a digital library focused on a weekly theme in science. They use keyboarding and higher-level tasks with Nearpod. I am amazed at what 7 years can do with technology."

Figure 4 shows that by the end of the third year of implementation, there were increases in the percentage of teachers who indicated that they alter instructional use of classroom technology based upon the newest applications and research, as well as that they plan technology-related activities that improve students' basic skills. There were some decreases by the end of the third year in the percentage of teachers who indicated that, when using classroom technology, they integrate the most current research on teaching and learning and seek out activities to promote increased problem-solving and critical thinking.

While the percentage of teachers responding "true of me" or "very true of me" to these technology integration items consistently increased during the first and second years of implementation, SY 18-19 represents the first time some percentages have decreased over a school year. However, it is important to note that the percentage of teachers responding "true of me" or "very true of me" at the start of SY 18-19 was higher than or very close to the ending percentages for SY 17-18. In other words, it appears progress in instructional strategies was made between the end of SY 17-18 and the beginning of SY 18-19, perhaps due to participation in the summer "tech camp" GBSD led with as many as 10 other school districts.

Figure 4. GBSD Instructional Strategies
(% True of Me/Very True of Me)



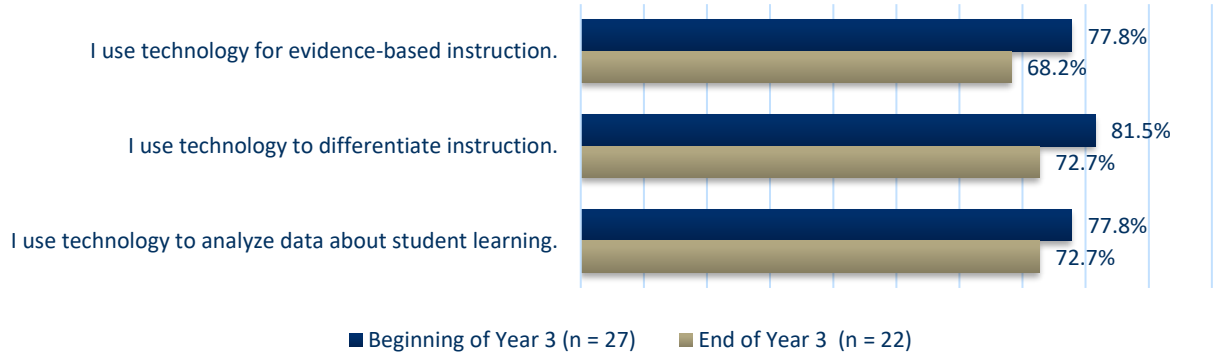
Teachers who participated in interviews described their use of technology to support new instructional techniques. All teachers reported that they are integrating technology similarly to integration during second grant year, and some reported integrating technology even more than previous years. While all

teachers shared individual successes with meaningful integration of technology, one teacher expressed that technology may still be used more to increase engagement than new strategies:

> *I still feel like a lot of us are at the place where, as a district, we're learning how to use the technology and using it as much to increase engagement as for how to transform their learning. I don't think we're at that point—we're kind of moving that way more.*

At the beginning and end of SY 18-19, teachers rated the extent to which they use technology for evidence-based instruction, to differentiate instruction, and to analyze data about student learning. Figure 5 shows that there was a decrease in the percentage of teachers that reported using technology to support each of these instructional practices. While teachers' reported rates of technology use for evidence-based instruction and to differentiate instruction increased each of the first two grant years, SY 18-19 represents the first year there was a decrease from beginning to end of the year. However, use rates reported at the beginning of SY 18-19 were very similar to use rates reported at the end of SY 17-18, indicating teachers began SY 18-19 with relatively high use rates.

Figure 5. GBSD Instructional Technology Use
(% A Moderate Amount/A Great Deal)



In interviews, teachers described their use of technology to differentiate their teaching and tailor students' learning to their individual skills, abilities, and needs. One teacher explained how this has impacted his reading instruction in particular:

> *I am able to assign certain reading to certain kids, and this way everyone has the same content but not the same booklet. So when they have a discussion, the kids who, whether they're reading at a level R, A, Z or whatever level they're at, they're able to see because they've been exposed to the same things but at their own level.*

Teachers reported their technology skill level on the beginning and year-end surveys by rating themselves at one of the following five levels:

Level 1: I get someone else to do technology-based tasks for me.

Level 2: I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job.

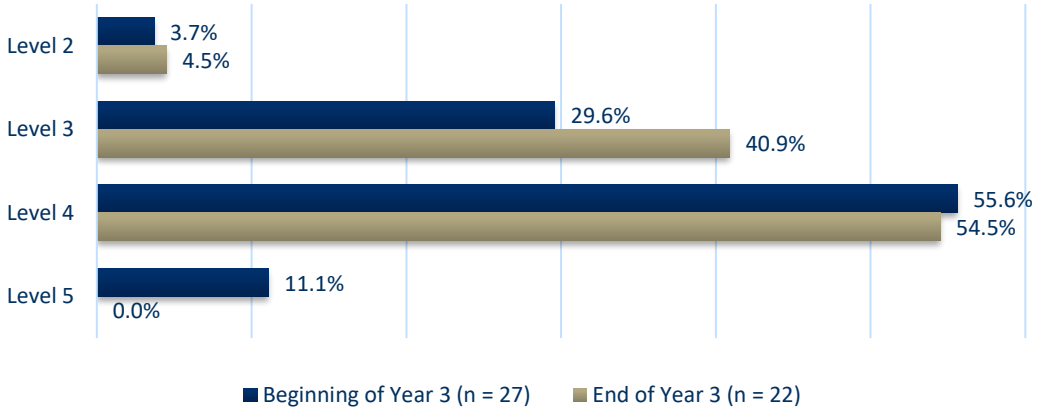
Level 3: I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose.

Level 4: I use a variety of technology tools, and I use them efficiently for all aspects of my job.

Level 5: I use technology efficiently, effectively, and in creative ways to accomplish my job.

Figure 6 shows that there was a decrease in the number of teachers reporting their skill level as a Level 4 and a Level 5 across SY 18-19. During spring 2018, 100.0% of teachers rated themselves as Level 3 and above, but by spring 2019, that number fell to 95.5%. The majority of teachers rated themselves as Level 4 at the beginning and end of SY 18-19.

Figure 6. GBSD Teachers' Technology Skill Level



What new instructional strategies are teachers reporting?

Section Highlights:

In the third year of implementation, teachers reported use of new applications and technology supports to improve instruction and engage students, in addition to continued use of several supports reported during the first two grant years. Leaders and teachers both gave high ratings to use of technology for engaging students in learning and for demonstrating flexibility and responsiveness. Evaluation results also show that novel, technology-based instructional strategies continue to be implemented within GBSD. The most common instructional strategies teachers reported included use of technology to support small group instruction and to support differentiated instruction.

Table 4 presents results from the rubric designed to rate the use of technology to support instruction. Teacher self-ratings are presented in the table, in addition to leader observations of five teachers (two from North Gresham and three from Kelly Creek). Leader observations were aggregated with leader survey data from one principal who was asked about "TechSmart teachers as a whole," creating one total leader average rating. Leader ratings showed that communicating with students, engaging students in learning, and demonstrating flexibility and responsiveness were the aspects of instruction where teachers were most often using technology to support instruction. Engaging students in learning received the highest ratings by leaders in the SY 17-18 evaluation as well. All other categories were rated higher by leaders in SY 18-19 than SY 17-18, with the sole exception of using questioning and discussion techniques, which received a slightly lower score than the previous year.

Leaders rated teachers higher than teachers rated themselves for every category, with the single exception of using questioning and discussion techniques, which was rated equally by teachers and leaders. Teachers rated themselves highest on use of technology for engaging students in learning, using assessment in instruction, planning and preparation, and demonstrating flexibility and responsiveness. Of these four categories, the two categories of engaging students in learning and demonstrating flexibility and responsiveness were also rated especially highly by leaders.

Table 4. Technology Used for Supporting Instructional Practices
(1 = Not at all, 2 = Very Little, 3 = Somewhat, 4 = To a Great Extent)

	Teacher Survey	Leadership Rubric and Survey (n = 6)
Planning and Preparation	**3.09** (n = 22)	**3.83**
Managing Classroom Procedures	**2.86** (n = 22)	**3.83**
Organizing Physical Space	**2.50** (n = 22)	**3.33**
Communicating with Students	**2.95** (n = 22)	**4.00**
Using Questioning and Discussion Techniques	**3.00** (n = 22)	**3.17**
Engaging Students in Learning	**3.41** (n = 22)	**4.00**
Using Assessment in Instruction	**3.14** (n = 22)	**3.67**
Demonstrating Flexibility and Responsiveness	**3.05** (n = 21)	**4.00**

The rubric also asked teachers and leaders to "provide examples of how teachers used technology to support instruction for at-risk sub-groups (students of color, English Language Learners (ELL), SPED,

low SES) in the areas defined above." Leaders provided examples of how the technology has supported instruction with ELL students. One leader said:

> *Students used Google Slides to create a visual presentation to share their learning of penguins. The ELD teacher was in the room supporting ELLs. The teacher frequently checked-in with students as she facilitated the lesson. Visual cues were used to support learners.*

Leaders who completed the rubric also provided examples of how technology is being used to support new instructional practices. Several leader rubrics highlighted the practice of differentiating instruction. One leader said, "Students are creating 'vocabulary posters' using Google Slides. The teacher allows for differentiation as students research their definition and select their image that matches. Students can also work with a peer helper for extra support." Differentiating instruction was also highlighted in the year-end status report, which indicated that teachers are using online formative assessments, such as Quizlet, Nearpod, Kahoot, and Google Forms to gain real-time learning data and differentiate instruction, allowing students to be assessed at their instructional level. Another leader shared a strong example of differentiated learning during observations, stating:

> *First grade students were using a tool called Blendspace and they were interacting with different online resources like video, websites, and audio to help them do mini-research reports. The variety of resources let students of all levels have support. The video capability was great because students could watch it as many times as needed for repetition of information. Students had sentence frames at the front of the room for reference and some students were grouped together for instructional support.*

The year-end survey asked teachers to provide up to three examples of instructional strategies that have been particularly effective in their classrooms and to rate the effectiveness of their use on a scale of one to five. Some teachers listed the technology supports they use during instruction. The most support tools teachers mentioned are listed in Table 5, along with the average effectiveness rating from teachers.

Table 5. New Technology Being Used for Instruction

Technology Supports	Year-end Effectiveness Rating
Nearpod	**4.50** (n = 2)
Seesaw	**3.50** (n = 2)
iReady	**3.00** (n = 2)
Code.org	**4.00** (n = 1)
Google Classroom	**4.00** (n = 1)
Google Docs	**3.00** (n = 1)
Quizlet	**4.00** (n = 1)
Google Slides	**4.00** (n = 1)

During interviews, teachers and leaders gave examples of technology supports and how they are using them in their classes or schools. Seesaw, iReady, QR codes, SMART Boards, Chromebooks, Google Classroom, and Google Slides were mentioned by teachers and leaders as a commonly and successfully used technology supports. One teacher mentioned multiple technology supports used in her classroom:

> *They can use QR codes to watch and listen to books being read aloud. And while they're watching and listening they have a response machine and a job to respond to the story. That's a lot of fun. They enjoy that. We choose a story to read every week. We use Seesaw where they practice writing and typing and recording themselves, read word family words or site words, words that we've learned, and it gives them that second or third or fourth way to practice those words. We do that a lot.*
>
> *And we also we love doing this, and oh my gosh, it promotes their reading fluency. They love to record themselves reading books. So we practice reading a book two or three times. When they feel like it's 80%, I don't call out 80% to them. I say like, well, when you feel really good about it and you're not making a whole lot of mistakes you can record yourself reading a story. They love it. They love getting it out, recording themselves, sitting and hearing it back.*

Aside from teachers listing the technology supports being used during the school year, teachers also provided examples of how the new technology is being used to support instruction on the year-end survey. Table 6 shows that the most common ways in which teachers report using the new technology to support instruction are for small group instruction (36.0% of teachers mentioned), to differentiate instruction (31.8% of teachers mentioned), and for hands-on activities (18.1% of teachers mentioned).

Table 6. How New Technology is Being Used for Instruction

Technology Supports	Year-end Effectiveness Rating
For small group instruction	**3.75** (n = 8)
To differentiate instruction	**3.71** (n = 7)
For hands-on activities	**3.25** (n = 4)
For whole group lessons	**4.50** (n = 2)
For practicing skills	**3.50** (n = 2)
For reading	**5.00** (n = 2)
For communication	**3.00** (n = 1)
For scientific observations	**4.00** (n = 1)
For deepening understanding	**4.00** (n = 1)
For writing	**4.00** (n = 1)
For self-guided learning	**3.00** (n = 1)

Teachers and leaders expressed excitement for the changes they have seen in instructional strategies and supports during the course of the grant thus far, while also citing the importance of continued growth. In the year-end status report, leadership shared that there is a need for ITCs to continue to encourage and challenge teachers to use technology in more transformative ways, beyond substitution or augmentation. During leader interviews, one district ITC described the impact of the TechSmart grant on instruction:

The biggest impacts would be over our literacy instruction and how it's changed over the last couple of years with the TechSmart work. I see students in our TechSmart schools accessing digital reading resources throughout the day from a variety of different reading platforms, whereas before that wasn't happening.

How are the new instructional strategies impacting student engagement?

Section Highlights:

Data from the SY 18-19 evaluation show evidence of continued positive impacts on student engagement. Teachers continued to report benefits of technology for student engagement because it helps students look forward to lessons, provides opportunities to work in new and creative ways, and allows students to work independently with success. Teacher survey data showed that students' comfort and abilities with technology increased again from SY 17-18, though at a lower rate of change than previous years.

During interviews, teachers and leaders were asked how technology integration has impacted student engagement, and several themes emerged. Teachers described how excited students get about working with technology during lessons, explaining how it helps students look forward to class. One teacher discussed the use of gamification in technology and compared it to his own past:

They want to type. They like to type. They like the computer learning games because I'm going, "Oh, today is free time. You can play the games." And in some ways, they're not really playing a game, but it is a game because it's educational. So I feel a lot better about it. This is, you know, 21st century transitioning. I didn't have a smart phone until I was in graduate school. I didn't have my first laptop until 1994 and that was going into college and everything. So now they see it as a normal thing, and the reluctance isn't there. Little kids love it regardless of ability level.

Another theme that emerged in teacher interviews was that technology gives students the ability to work in new and creative ways. Teachers explained that the ability to create something unique and then to share it with an audience fosters engagement and encourages students to take pride in their work. One district ITC tied this ability to connect and create to equity for students from historically marginalized groups:

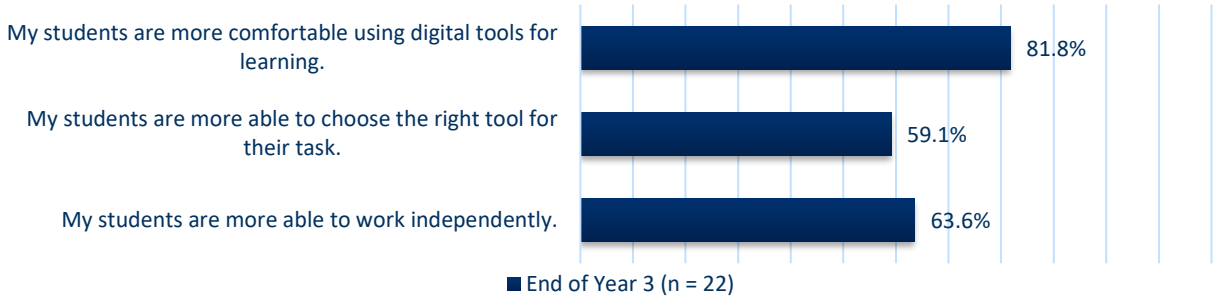
The fact that students can connect with different things online and be able to share and create things online kind of creates that engagement piece that might be missing for some students who've traditionally been marginalized. There's kind of an added excitement and engagement when you add in anything digital, really.

Student engagement was also highlighted in the year-end status report, which described anecdotal evidence of increases in engagement and excitement toward learning. The report indicated that students

have expressed they feel more interested in the material when they can add to their own digital portfolio or learning space, use voice-to-text features to see their ideas coming out, or have more choice in the classroom.

On the year-end survey, teachers rated students' comfort with using digital tools for learning, ability to choose the right tool for their task, and ability to work independently as it compares to the previous school year. Almost 82% of teachers agreed that their students were more comfortable using digital tools than students in SY 17-18, while nearly 60% of teachers agreed their students were more able to choose the right tool for their task and almost 64% agreed their students were more able to work independently (See Figure 7). These rates are somewhat lower than teachers' reflections on changes from SY 16-17 to SY 17-18, but all still represent positive change from SY 17-18 to SY 18-19.

Figure 7. GBSD Year-End Student Technology
(% Agree/Strongly Agree)



Are the new instructional strategies showing promise for improving academic outcomes?

Section Highlights:

Analysis of DIBELS data showed that Treatment Group Cohort 1 and Treatment Group Cohort 2 had nearly identical rates of students performing at or above benchmark for kindergarten and first grade. Despite a dip in rates of students at or above benchmark in first grade, Treatment Group Cohort 1 rebounded in second grade. Both Treatment Group cohorts maintained higher rates of students at or above benchmark than the Comparison Group for all time points. Anecdotally, teachers and leaders agree that technology-based instructional strategies are showing promise for improving academic outcomes.

During both teacher and leader interviews, participants expressed that they see great promise for student outcome improvement from new, technology-supported instructional strategies. Even when participants could not tie new instructional strategies to outcome data, all participants shared their opinions that student outcomes have been impacted. When asked whether using technology in classrooms has shown promise for improving student academic outcomes, one district ITC shared how they have seen change anecdotally:

I would say a general yes. The tricky thing with this is that we haven't been able to drill down to specifics. We can look at standardized testing results and things like that, but I just don't have that data. I have anecdotal information, and from talking

with teachers it seems to be that the access to digital texts has been a really positive thing to increase overall reading in the classroom, like the chances of reading throughout the day and opportunity for reading throughout the day.

Another theme that emerged from interviews was the change in perspective as implementation has progressed through time. Throughout interviews, leaders and teachers all frequently referenced changes since the first two years of the grant, with increasing focus on sustainability and scalability of the program. One ITC described her efforts to encourage teachers to continue to move toward full integration of technology-supported instructional strategies with student outcome goals:

One of the things that I've really been trying to work on with the teachers is just what's the purpose of this? At first, it was this new shiny object and now it's okay, how does this tie to standards? How does this tie with learning? What are the students going to get out of this? So they know when I come in, [they say], "Oh, we're doing this and this is how it meets the standard."

Another key point raised during leader interviews was related to the broader context within which student outcome data falls, particularly for high-needs students. One leader described the challenges and context around improvement in such settings:

Even though we have these really specific assessments we're using with DIBELS and ELPA and stuff, it's really hard to look at causation in any of that. There are so many nuances, and it's not in any way made to be excuse-like, but at North Gresham, the impact on at-risk student and just the demographic mental health needs and behavioral needs of their population is changing every year. And yet they're making this microscopic growth in their reading. Sometimes I feel like by not going backwards, you're going forwards right now, but there is no way to capture that.

Student Achievement Data

As described in the methods section of this report, following SY 18-19, student achievement data were available for two Treatment Group cohorts, as well as the Comparison Group. Table 7 presents the student achievement data available for this report. GBSD uses the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment, as well as the English Language Proficiency Assessment (ELPA).

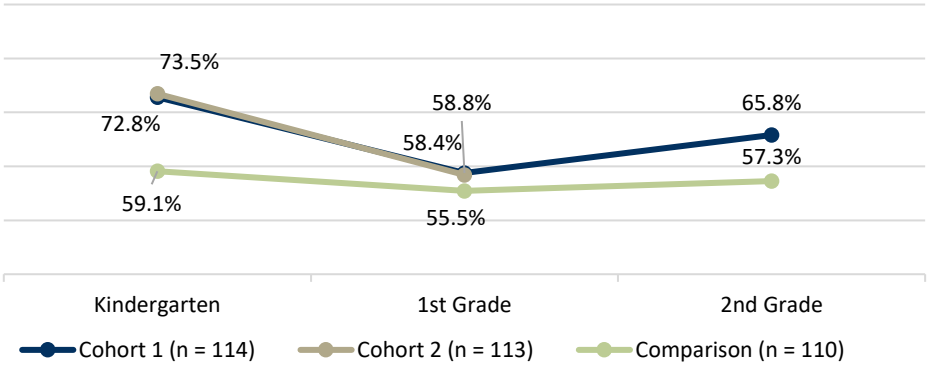
Table 7. GBSD Student Achievement Data

	Kindergarten	1st Grade	2nd Grade
Treatment Group Cohort 1 (Kindergarten in SY 16-17)	DIBELS ELPA	DIBELS ELPA	DIBELS
Treatment Group Cohort 2 (Kindergarten in SY 17-18)	DIBELS ELPA	DIBELS ELPA	—
Comparison Group (Kindergarten in SY 16-17)	DIBELS ELPA	DIBELS ELPA	DIBELS

DIBELS

DIBELS are a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade. DIBELS data were available from the district through SY 18-19, and these results are presented in Figure 8 for Treatment Group cohorts and the Comparison Group.

Figure 8. Percentage of Students at Benchmark in Spring on DIBELS Assessment



For Cohort 1 students, DIBELS results showed that the percentage of students meeting benchmark decreased from 72.8% in spring of kindergarten to 58.8% in the spring of 1st grade, then increased substantially in spring of 2nd grade to 65.8%. Cohort 2 results for kindergarten and first grade mirrored Cohort 1 results almost exactly, with a decrease from 73.5% in spring of kindergarten to 58.4% in the spring of 1st grade. Cohort 2 data for 2nd grade is not yet available. The percentage of Comparison Group students at benchmark showed little change from kindergarten to 2nd grade, decreasing slightly in 1st grade and rebounding by 2nd grade. Though Treatment Group students showed nearly 15% decrease between kindergarten and 1st grade and nearly 10% increase between 1st grade and 2nd grade (i.e., Cohort 2), the Treatment Group maintained higher percentages of students at benchmark than the Comparison Group across all cohorts and all time points.

Instructional practices show promise for improving student academic outcomes with at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an Individualized Education Plan), and those not on track to meet academic standards).

Section Highlights:

Based on further analysis of DIBELS data, results for students from at-risk subgroups largely mirrored full group results. Broadly, Treatment Group Cohort 1 had decreased rates of students performing at or above benchmark from kindergarten to 1st grade, but increased rates from 1st grade to 2nd grade. Treatment Group Cohort 2 rates for kindergarten to 1st grade generally mirrored Treatment Group Cohort 1 rates. For ELAP21 assessment scores, Treatment Group Cohort 1 generally showed higher proficiency than the Comparison Group, while Treatment Group Cohort 2 mirrored the Comparison Group for kindergarten and 1st grade. Teachers provided many examples of use of technology to support at-risk students and described benefits anecdotally.

As mentioned throughout this report, the TechSmart grant focuses on the literacy achievement gap, specifically for students of color, English Language Development (ELD) students, students with disabilities, and students living in poverty. Many leaders and teachers shared examples of the ways that technology supports new instructional strategies and techniques and the promise this shows for at-risk subgroup outcome improvement. During the year-end survey, teachers were asked to share ways they have supported instruction of students belonging to at-risk subgroups using new technology. Table 8 includes quotes from teachers' responses.

Table 8. GBSD Teachers' Use of Technology Supported Instruction with At-Risk Subgroups

"In my small reading intervention groups, where I see the most struggling students in each grade, I've used my iPad and laptop to deepen the understanding of concepts and vocabulary through videos, pictures, and reading practice apps."
"It gives access to low SES students who may not have access to a tablet. It allows them to take photos and then write/speak about the photos."
"All students are differentiated based on level of understanding and learning. We use iReady for math and read live for students working on their fluency goals."
"Building vocabulary and background knowledge for ELD and SPED students. Also, using video to expose students to a subject to front load info."
"Research projects and creating digital presentations."

Leaders who participated in the interviews discussed how technology has made learning more accessible for the ELL and SPED students. In addition to the strategies for instruction described in the table above, one ITC shared several other ways that technology is improving support for at-risk students:

Really across the board, but also for our subgroups, I think for students on IEPs or 504s, there's been so many things that we've been able to do and accommodate for those students with digital technology. Voice-to-text features, being able to use online dictionaries, word prediction software, and things like that. Even though I don't know the research on this, we've had some students that have said that they benefit from the dyslexia add-ons or apps where it changes the way the font looks to make it more readable. Those have been some really positive things, especially for students with special needs.

Another key theme around the impacts of technology on learning of their at-risk students is the way use of technology at school increases equity and levels out differences among groups. The effectiveness of one-to-one technology provided by the grant was emphasized by teachers and leaders. One teacher shared, "A lot of kids of poverty don't have iPads at home or tablets that work like the ones we have here. So getting that in their hands and not just to play games, but to learn with it I think is huge. They love it." This sentiment was echoed at the leadership level as well. One principal shared:

Traditionally, our students who are underserved, a big portion of the gap is students who don't have access to digital devices. This has allowed every single student to have the same equal access. Our students do, and ours have traditionally come from families that are able to have that technology in their homes. We now have students in our school who, even though they might not have access to technology in their home, have access to that technology here at school.

In addition to increased access to technology, teachers and leaders emphasized the importance of giving all students a voice. One ITC shared improvements they have seen for ELL students in particular, saying, "Especially at Kelly Creek, we focus on equity. We're having questions and trying to design lessons with technology that can focus on those equity conversations, especially with giving all students a voice. Letting students who are English language learners have a chance to practice speaking and listening in a safe environment. We've been doing a lot of projects, especially with the student voice being able to record themselves speaking. They have little evaluation rubrics they assess themselves on to listen back and be like, oh, you know, I was clear when I was speaking."

Interviews with teachers and leaders also illuminated increased opportunities for students with special needs. One teacher described a situation where a student was able to be engaged in learning through technology, regardless of previous failed attempts to engage in a more traditional approach:

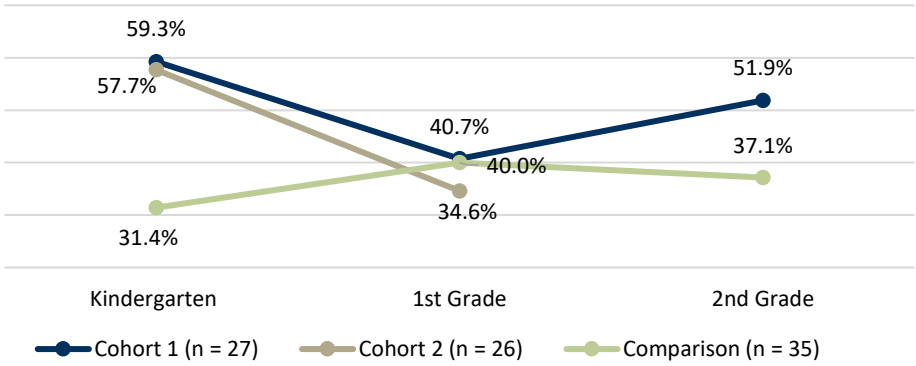
I have a little girl right now whose only goal in the classroom is just to learn how to be a student. There's no academic goal here. At the beginning of the year, we learn the ABCs, so she knows five letters because she couldn't attend. But when I put an iPad in front of her and I give her an app where she is interacting and all the focus is learning the alphabet, the sounds of the letters, and making words, she's engaged and she's learning and she's not rolling around on the group or causing a ruckus in

the class, which is what her behavior does. She's not able to sit down and attend, but she will attend to an iPad.

Student Achievement Data

To examine whether instructional practices show promise for improving academic outcomes with at-risk subgroups of students, DIBELS scores were examined for Treatment Group Cohort 1 and Treatment Group Cohort 2, as well as the Comparison Group. Figure 9 shows the percentage of LEP students who performed at or above benchmark on the DIBELS assessment at each time point. Results largely mirror those of the full group, presented above (Figure 8).

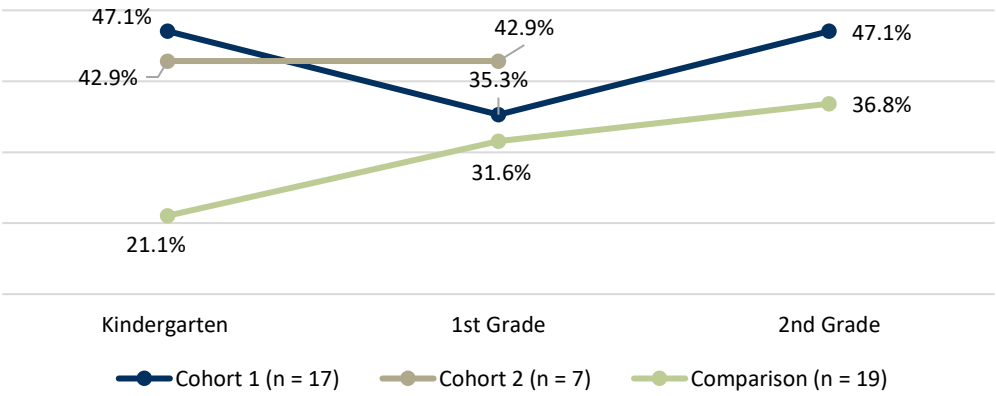
Figure 9. Percentage of Treatment and Comparison LEP Students at Benchmark in Spring on DIBELS Assessment



Rates of LEP students at or above benchmark for Treatment Group Cohort 1 and Treatment Group Cohort 2 decreased by approximately 20% between kindergarten and 1st grade, but rebounded by over 10% in Treatment Group Cohort 1 by 2nd grade. The Comparison Group increased by nearly 10% from kindergarten to 1st grade, but leveled off more between 1st grade and 2nd grade. Only Treatment Group Cohort 2's rates for 1st grade were lower than rates for the Comparison Group.

Figure 10 shows the percentage of SPED students who performed at or above benchmark on the DIBELS assessment at each time point. Treatment Group Cohort 1 dipped in rates of students performing at or above benchmark at the end of 1st grade, but both kindergarten and 2nd grade rates were the highest of any

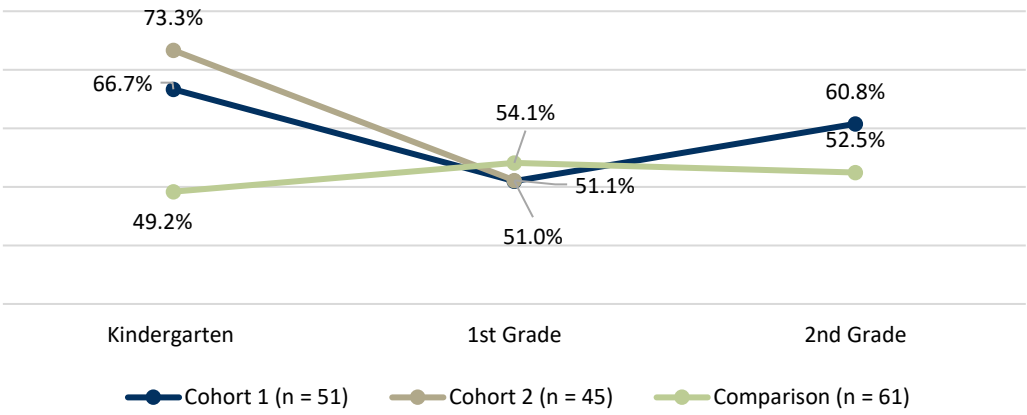
Figure 10. Percentage of Treatment and Comparison SPED Students at Benchmark in Spring on DIBELS



group or time point. Treatment Group Cohort 2 stayed level across kindergarten and 1st grade. Finally, the Comparison Group increased over time, but remained lower than either Treatment Group cohort at all time points.

Figure 11 shows the percentage of students of color who performed at or above benchmark on the DIBELS assessment at each time point. Treatment Group Cohort 1 and Treatment Group Cohort 2 both had substantially higher rates of students performing at or above benchmark than the Comparison Group during spring of kindergarten, but dipped slightly below the Comparison Group by spring of 1st grade. Treatment Group Cohort 1 returned to the highest rate of students at or above benchmark by spring of 2nd grade.

Figure 11. Percentage of Treatment and Comparison Students of Color at Benchmark in Spring on DIBELS



ELPA Assessment

Table 9 below presents the ELPA21 results for Treatment Group Cohort 1 and the Comparison Group students in kindergarten and 1st grade, as well as results for Treatment Group Cohort 2 in kindergarten. The scores presented in Table 9 show that 81.3% of Treatment Group Cohort 1 students who completed the ELPA21 assessment in kindergarten scored at the "Progressing" proficiency status, compared to 66.7% of Treatment Group Cohort 2 students and 67.5% of Comparison Group students. In 1st grade, no Treatment Group Cohort 1 students fell into the "Emerging" status, while over 10% of Comparison Group students were designated as "Emerging." Furthermore, 93.1% of Treatment Group Cohort 1 students fell into the "Progressing" status in 1st grade, while 86.8% of Comparison Group students fell into the same category. Finally, 6.9% of Treatment Group Cohort 1 students fell into the "Proficient" status in 1st grade, while only 2.6% of Comparison Group students were designated as "Proficient."

Table 9. ELPA21 Results for SY 16-17 and SY 17-18

	Proficiency Determination	Cohort 1 (n = 29-32)	Cohort 2 (n = 39)	Comparison Group (n = 38-40)
Kindergarten	Emerging	15.6% (5)	33.3% (13)	32.5% (13)
	Progressing	81.3% (26)	66.7% (26)	67.5% (27)
	Proficient	3.1% (1)	0.0% (0)	0.0% (0)
1st Grade	Emerging	0.0% (0)	—	10.5% (4)
	Progressing	93.1% (27)	—	86.8% (33)

	Proficient	6.9% (2)	—	2.6% (1)

Is the rate of student growth in one or more AHR outcome greatest for at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards))?

Section Highlights:

Students of color, LEP, and SPED underperformed non-at-risk students when considering the percentage of students who were at or above benchmark at the end of each school year. However, the percentage of students at or above benchmark seemed to follow other trends presented in this report, as Cohort 1 students showed a dip in rates of benchmark performance from kindergarten to 1st grade but an increase in rates of benchmark performance from 1st grade to 2nd grade.

Analysis of DIBELS data provided information about how student progress may differ for at-risk subgroups as compared to non-at-risk subgroups within each Treatment Group cohort. Figure 12 presents the percentage of Cohort 1 LEP and non-LEP students performing at benchmark on the DIBELS assessments in kindergarten, 1st grade, and 2nd grade. Within Cohort 1, non-LEP students outperformed LEP students at all three time points. Figure 13 presents the percentage of Cohort 2 LEP and non-LEP students performing at benchmark on the DIBELS assessments in kindergarten and 1st grade. Within Cohort 2, non-LEP students outperformed LEP students at both time points, similar to Cohort 1.

Figure 12. Cohort 1 LEP vs. Non-LEP DIBELS Spring Benchmark

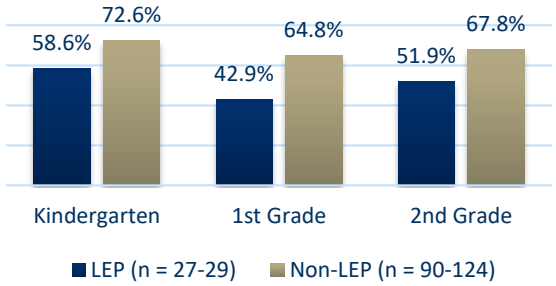
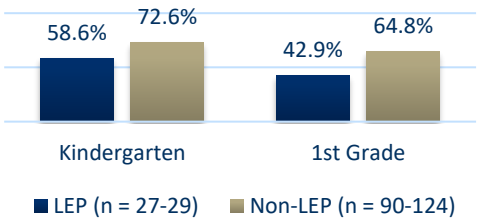


Figure 13. Cohort 2 LEP vs. Non-LEP DIBELS Spring Benchmark



The trend for SPED students and non-SPED students is consistent with the trend shown for LEP and non-LEP students for both Cohort 1 and Cohort 2.

Figure 14. Cohort 1 SPED vs. Non-SPED DIBELS Spring Benchmark

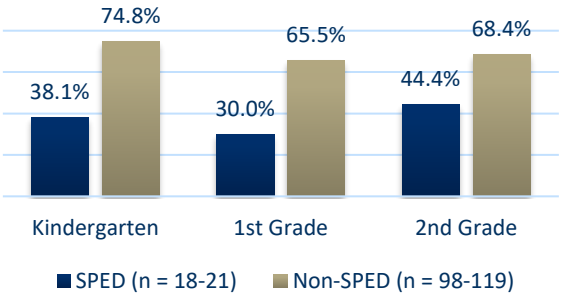
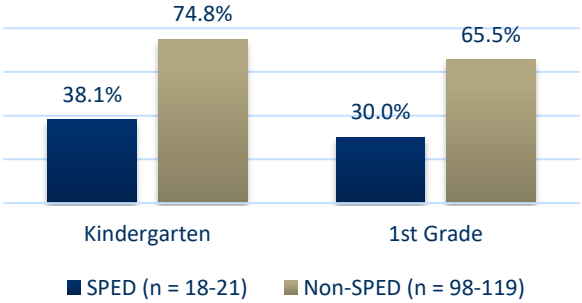


Figure 15. Cohort 2 SPED vs. Non-SPED DIBELS Spring Benchmark



There were a higher percentage of non-SPED students at benchmark in kindergarten and 1st grade for both cohorts (see Figure 14 and Figure 15) and a higher percentage of non-SPED students at benchmark in 2nd grade for Cohort 1.

Cohort 1 and Cohort 2 minority verses non-minority DIBELS scores follow the same trend as the other subgroups presented above. Non-minority students outperformed minority students at all time points across both cohorts (see Figure 16 and Figure 17).

Figure 16. Cohort 1 Minority vs. Non-Minority DIBELS Spring Benchmark

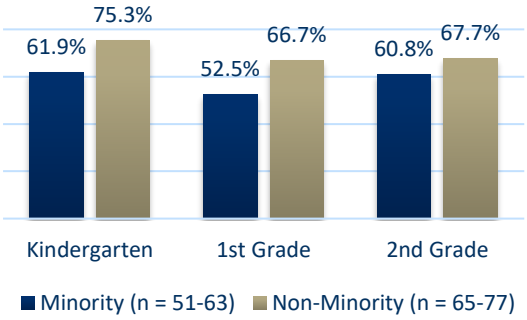
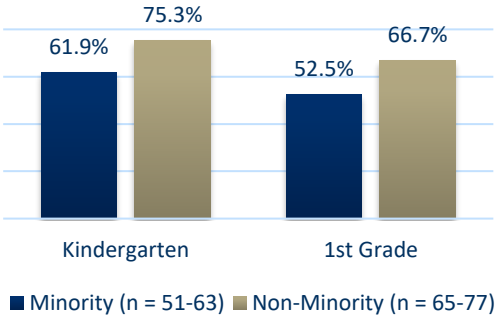


Figure 17. Cohort 2 Minority vs. Non-Minority DIBELS Spring Benchmark



Digital Age Learning Culture

District embraces a cultural shift and views technology as positive.

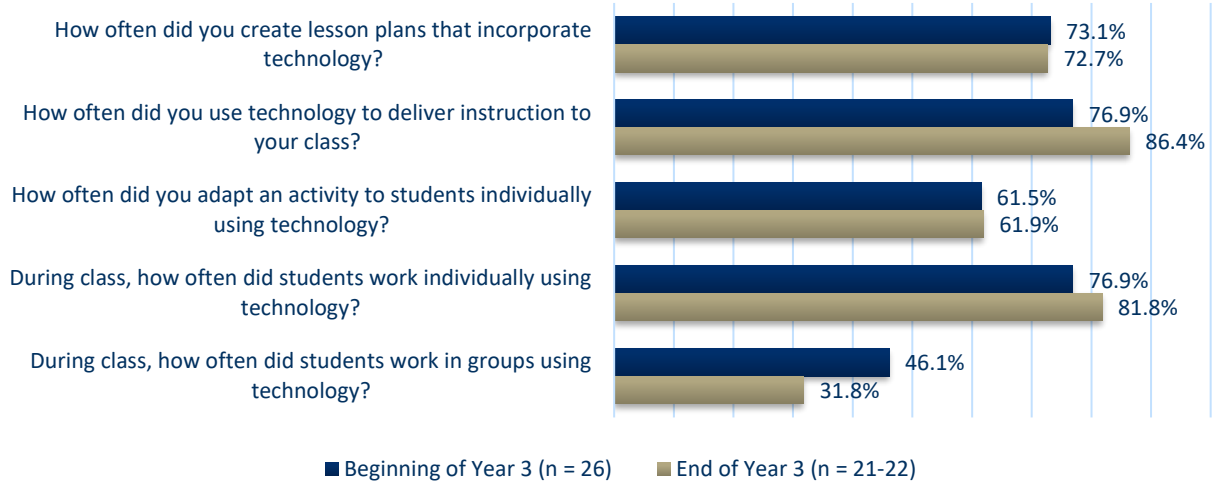
Has the use of technology to support instructional practices increased?

Section Highlights:

Teacher survey data provided evidence that use of technology to support instruction increased in some areas from beginning to end of SY 18-19, stayed approximately the same in other areas, and decreased in one area (i.e., how often students work in groups using technology). Frequency of technology integration did not increase substantially from SY 17-18 to SY 18-19, but rather stayed approximately level or decreased slightly.

Figure 18 shows the frequency with which technology was integrated in various ways from the beginning to end of SY 18-19. The frequency with which teachers used technology to deliver instruction and with which students worked individually using technology increased noticeably from beginning to end of SY 18-19. The frequency with which teachers created lesson plans incorporating technology and adapted activities to students individually using technology stayed relatively the same from beginning to end of SY 18-19. Finally, the frequency with which students worked in groups using technology declined over SY 18-19. While these rates rose consistently from SY 16-17 to SY 17-18, surveys from SY 18-19 represent the first year of the grant in which year-end rates have not represented a substantial improvement over the previous year.

Figure 18. GBSD Frequency of Technology Integration
(% A Moderate Amount/A Great Deal)



Is the learning management system useful for identifying effective instructional practices (more efficient, easier, data-driven)?

Although GBSD has not yet implemented a formal learning management system (LMS) the district has created a technology steering committee to review and conduct an LMS pilot. In the meantime, the

district continues to use Google Classroom, and the year-end status report indicated that use of Google Classroom continues to grow.

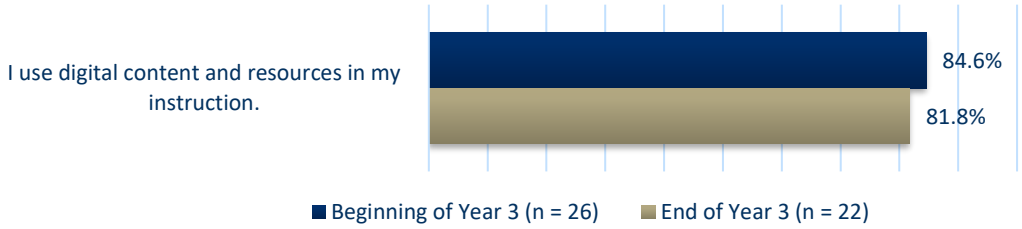
Do teachers have increased access to and use of digital content and resources?

Section Highlights:

From the beginning to the end of SY 18-19, teachers reported a small decrease in use of digital content and resources but an increase in students' access to technology in classrooms. Teachers provided many examples of online resources used in their classrooms, such as Seesaw and Google Classroom.

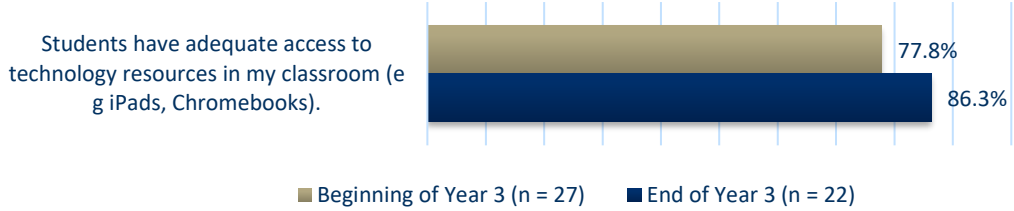
Teachers have reported increased use of digital content and resources throughout the grant period, as described throughout this report. SY 18-19 showed a small reduction in use of digital content and resources in instruction from beginning to end of the year; however, over 80% of teachers reported using digital content and resources at least a moderate amount at both time points (see Figure 19).

Figure 19. GBSD Use of Digital Content and Resources
(% A Moderate Amount/A Great Deal)



On the other hand, student access to technology reported by teachers improved substantially from beginning to end of SY 18-19. By the end of the year, 86.3% of teachers reported students had adequate access to technology resources (Figure 20), representing improvement over the beginning of SY 18-19, as well as over SY 17-18.

Figure 20. GBSD Students Have Adequate Access to Technology Resources in my Classroom
(% True of me/Very True of me)



Examples of the most commonly mentioned digital content and resources include various online applications such as Seesaw, Google Classroom, and code.org lessons. Teachers also reported the value of technology for group learning and sharing. Table 10 provides examples of how various teachers use each of these resources.

Table 10. GBSD Teachers' Use of Digital Content

Digital Content	Teachers' Application of the Technology
Google Classroom and Other Google Tools (n = 4)	• *"We use technology to create Google slideshows based on science investigation and to incorporate writing."* • *"ENGAGEMENT with vocabulary and spelling words. Students create Google Docs through Google Classroom."* • *"Students wrote an opinion piece about their favorite holiday or season and then published it in a google doc. They also searched for pictures and added them to their doc."*
Other online resources (n = 3)	• *"Student access to QR codes and log in as part of classroom management."* • *"I am running the code.org lessons in my classroom."* • *"I use my own iPad and laptop in small reading groups to enhance and deepen learning with YouTube videos, Flocabulary, and reading games."*
Group Learning (n = 3)	• *"Teamwork and communication"* • *"Classroom discussion for understanding, partner share and teacher led."* • *"Using technology gives access to all learners, sharing their learning and understanding."*
Coding (n = 2)	• *"I am running the code.org lessons in my classroom."*
Seesaw (n = 2)	• *"I utilize Seesaw to help students practice sight words, demonstrate conceptual understanding of math and science, document accomplishments, and share thoughts and ideas on a topic."* • *"My students do a group research project on animals using TES Teach and Seesaw."*

Is there evidence of districtwide support for technology integration?

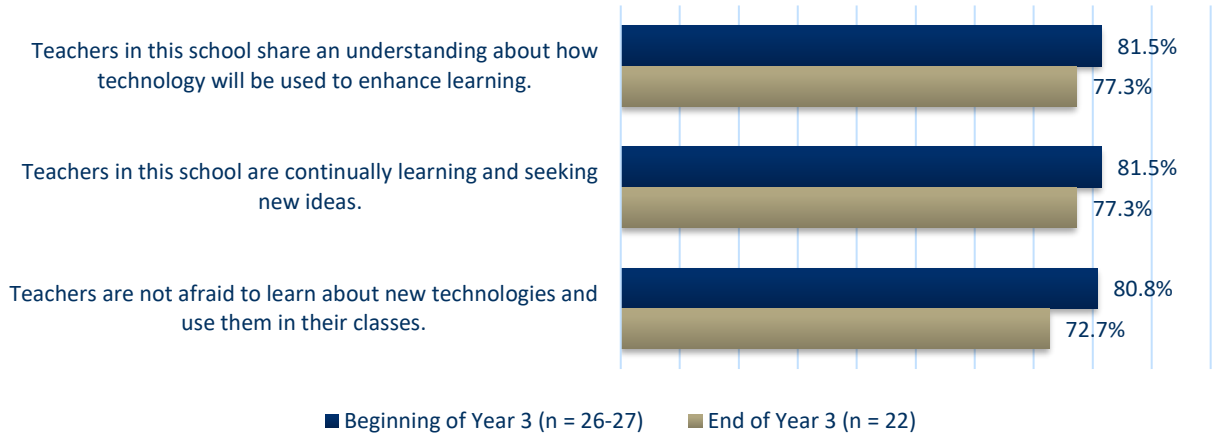
Section Highlights:

According to teacher surveys and interviews, the culture of technology support is more mixed than the previous year. Teacher survey data showed somewhat decreased perceptions of a culture of support from the beginning to end of SY 18-19. Teachers reported feeling very supported by each other and by their ITCs, but support for technology integration was more mixed at the principal level. The GBSD year-end report indicated that culture has shifted, and teachers now ask for more technology support, rather than pushing back against changes.

Teachers reported a generally positive culture surrounding technology, mixed with some uncertainty about priorities due to leadership changes within the district at the principal level. Figure 21 shows teachers' perceptions of a culture of support for technology integration from the beginning to end of SY

18-19. The percentage of teachers who agree that teachers share understanding about how technology enhanced learning, continually learn and seek new ideas, and are not afraid to learn about and use technology decreased in all three categories by 4.2 to 8.1 percentage points over the course of the year.

Figure 21. GBSD Teacher Perceptions of a Culture of Support for Technology Integration
(% Agree/Strongly Agree)



According to the year-end annual report, culture has improved overall as a result of the grant. The report stated, "The real success from this project is the way ongoing coaching support has helped shift teacher capacity and mindset, instructional practices, and learning culture in these two schools. There is a new level of excitement and innovation that is hard to capture in any data, but it is noticeable as you walk through these two buildings. It has also started a buzz that is catching on in our other schools. We now have a situation where people are asking for more, rather than pushing back on what is being offered."

Despite perceptions of overall cultural improvement, culture varied by school, and teachers described particular differences based on the principal leading each school. One principal was described as extremely supportive, while teachers at another school struggled to find what their new principal was looking for. One teacher said, "This year's been a little bit different because we have a new principal at the school. Her goals have not necessarily focused around technology. It's had a little bit of a shift as teachers adjust to what she's looking for. But when I do walkthroughs and fill in classrooms, I see a lot of technology integration that's just coming naturally."

When asked whether there is a culture of support around technology at their school, another teacher agreed that the culture is supportive, saying, "For sure, and it's really cool to see teachers that were very hesitant two or three years ago to even get started, and how now they're opening up their classrooms, other teachers coming in, and they're really confident and feeling good about the things they've learned. They're ready to share. I really like that part, to see how they've grown. It's exciting." Another teacher emphasized the value of ITC support for bringing along those teachers who are not as driven to integrate technology:

There are still some teachers who are reluctant, and the coaches have made [a big difference]. I can't speak for everyone else, but our coach is very understanding, very patient, and she is able to convince some of the people to use technology, whether it's like baby steps or you have people who are going full speed at the same time.

All interviewed teachers expressed appreciation for the ITCs and a desire to maintain high levels of access to onsite ITCs. According to the year-end status report, ITCs worked toward scaling the program up during SY 18-19, including the following efforts: tech walks for teachers of all grade levels; creation of a website that supports teachers and students with digital safety and citizenship; creation of a catalog of digital tools and resources and a process to get new tools added to the catalog; PD for elementary and middle school teachers around standards and strategies for implementation; creation of a Tech Innovation Summer Camp that provided PD to over 100 K-12 teachers from multiple districts; help designing STEAM labs for middle schools; and contributions to work to acquire, design, and roll out a "Tomorrow Bus" (i.e., a mobile lab to go to all schools and provide innovation and STEAM opportunities).

Despite the efforts of ITCs to help scale the program, teachers and leaders who were interviewed described the impacts of reduced availability of ITCs, who are now shared between TechSmart schools and other schools. One teacher pointed out the need for teachers to step in to fill gaps created by less availability of ITCs:

This is one thing that has changed with not having our coach in the building all the time. She was able to do like a highlight on something, where any teacher that was interested could go for half an hour and learn how to use Google Drive to organize things or use Book Creator to make a book, or just different thing that you could try out. If you wanted more of her, you could schedule with her. But now that she's not in the building, that is not happening as much. But I think that's where the teachers need to stand up and say, "Let me teach you about this. I've been using this a lot in my class. Let me show you some of the things you can do."

Do parents have an increased understanding and utilization of districts' technology assets?

Section Highlights:

Teachers report that the new technology has increased parent involvement and communication and that parents appreciate increased access to their child's information. Teachers report use of applications that facilitate communication and data sharing. Other teachers report barriers to communication with parents of historically underserved students, such as language barriers and lack of access to technology at home.

Teachers who participated in interviews described several ways they continue to increase parent involvement and communication through technology integration. Teachers reported that parents really

enjoy the involvement and want it to continue. One teacher said, "I have an app that I use to communicate with parents throughout the day, and I think that they really appreciate it. They can get ahold of me pretty much any time they need to with anything they need to let me know about. Last year, I did a quick survey, and only four parents got back to me, but they were all like, 'I love this. I hope they keep doing this in the next grade.'"

Another teacher who was interviewed shared information about barriers to parental involvement, especially for historically underserved families, such as low-SES and ELL families. The teacher said:

> *There are a few barriers. We're in a Title I area where some parents don't have access to internet. And I can't say it's all because they don't have the technology. Some don't want to. Some just, you know, don't have the technology or the knowledge. For example, some of the parents who are learning English as well, they may not know how to log in, and once they log in they don't know how to read the directions to go to where their child's work is. I think in some cases the kids are reading it to their parents or they're kind of translating.*

The year-end status report described Parent Teacher Committee meetings. At least two meetings in SY 18-19 featured presentations highlighting innovative use of technology by students, especially coding skills. Furthermore, the report described communications efforts that included newsletters, blogs, and other forms of communication to share information about student use of technology. Finally, North Gresham held two parent literacy nights, each with sessions focused on instructional technology.

Visible Leadership

District leadership is actively involved and working with key communities to accomplish change.

Are districts identifying effective instructional practices and disseminating information and results to other districts?

Section Highlights:

Interviews conducted during SY 18-19 showed that GBSD is working toward community-wide change through several inter-district efforts. ITCs continued to host Tech Walks within their district and across other districts. Efforts to work with the East County Technology Consortium continued as well. New efforts included two technology-focused teacher "summer camps" that involved at least 15 other districts.

Leaders and teachers who participated in interviews shared many ways that GBSD is advancing the dissemination of information and results regarding effective instructional practices within and outside of the district. Within the district, teachers described continued Tech Walks, involving teachers from around the district coming to TechSmart school classrooms to view technology integration and see how it is connected to student engagement and achievement. Some Tech Walks included teachers from outside the district, as well, to share ideas and methods. Teachers also described optional technology trainings offered by the district during curriculum instruction days.

Outside of the district, teachers and leaders described many advancing and novel efforts to increase collaboration and share results and strategies with other districts. One of these efforts includes the East County Tech Consortium, which also involves the Reynolds, David Douglas, and Centennial districts. The Director of Teaching and Learning shared, "Reynolds has focused more on secondary. They have more of the tech stuff going on at secondary, where we haven't. That's allowed our coaches to wrap our secondary early adopters and do Tech Walks with Reynolds in our district. It's been a huge help for us to be able to take people to secondary classrooms in Reynolds to see with their own eyes what they're doing."

Another effort involves leadership of two technology-focused teacher "summer camps". The summer camps are open to all districts in the area. One ITC shared, "I think we had 15 or 17 different districts represented of teachers coming to learn at our district last summer, and we hope to have the same again this summer. That's been a nice way to kind of share strategies and share some great things that are happening and get teacher leaders empowered to share what they've been doing in the classrooms."

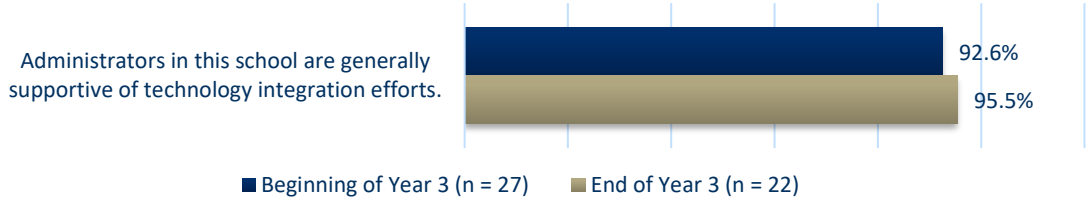
Do teachers feel increased support from district leaders regarding technology integration?

Section Highlights:

Teachers' perceptions of support from administration increased during SY 18-19, despite starting lower than perceptions of support at the end of SY 17-18. In interviews, teachers and leaders all expressed feelings of great support from district-level leaders, though principal-level support seemed more mixed.

Figure 22 shows that 92.6% of teachers felt that administrators in their school were generally supportive of technology integration efforts in the beginning of SY 18-19. This percentage increased by the end of SY 18-19, with 95.5% of teachers agreeing administrators support technology integration.

Figure 22. Perception of Administrators' Support of Technology Integration
(%Agree/Strongly Agree)



Teachers and leaders unanimously reported district-level leadership as highly supportive of technology integration, despite increased variation in support between schools at the principal level. According to those interviewed, district-level leadership has been active in their supportive of technology integration. One ITC shared:

> *Our new superintendent has been really vocal and supportive of all things technology, and really kind of putting that at the forefront. Also our curriculum director has been very, very supportive of us being innovative and trying different things. Almost any idea that we bring to the table has been really supported from leadership for sure.*

In leader interviews, the Director of Teaching and Learning shared that the superintendent has provided instrumental support to continuing technology integration for students who came from TechSmart schools. She said, "She's really pushing middle school right now because kids coming from these schools, they've had access to devices for the last three years of their [education]. You can't just let them in the room because they don't have [devices]. We're pretty committed to trying to get access."

Data-Driven Improvement

Current, relevant, and high-quality data from multiple sources are used to improve schools, instruction, professional development, and other systems.

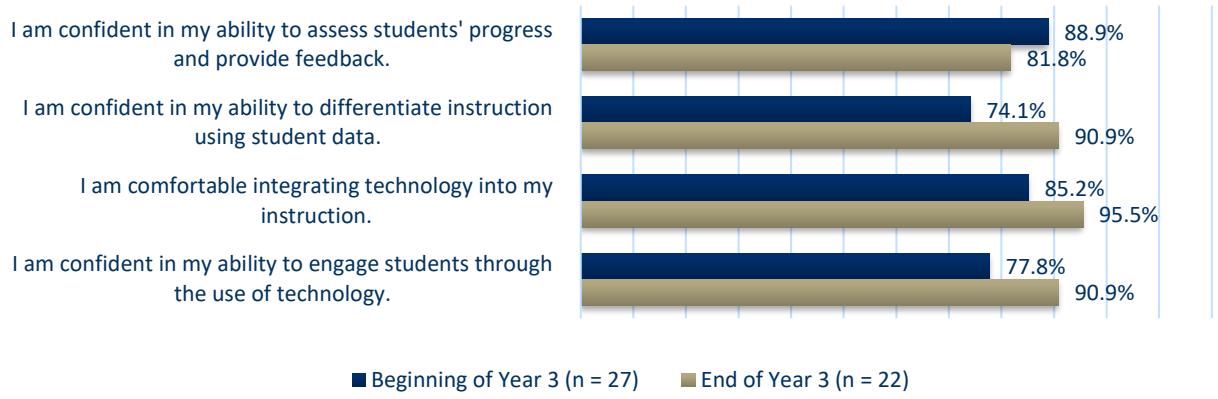
How are schools using data to improve instruction, professional development, and student performance?

Section Highlights:

Teachers generally reported increased confidence and comfort with data-driven strategies and technology-integrated instruction over the course of SY 18-19. Only teacher confidence in assessing student progress and providing feedback decreased over the year.

As described in other sections of this report, teachers have been increasingly integrating technology and data-driven instructional strategies. Figure 20 displays teachers' levels of confidence and comfort using data. From the beginning to end of SY 18-19, teachers reported increases in confidence and comfort with using data to differentiate instruction, integrating technology, and engaging students with technology. There were decreases between the beginning and end of SY 18-19 in teacher confidence in their abilities to assess student progress and provide feedback. Turning to comparison to previous grant years, teachers reported higher levels of confidence differentiating instruction using data and integrating technology into instruction following SY 18-19 than they reported following SY 17-18. On the other hand, compared to SY 17-18, teachers reported feeling less confident assessing student progress and providing feedback, as well as engaging students through technology at the end of SY 18-19.

Figure 23. GBSD Data Driven Improvement
(% Agree/Strongly Agree)



Funding & Budget

District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.

Have districts identified at least one opportunity for repurposing resources to support technology integration?

Section Highlights:

SY 18-19 represents the first year that GBSD implemented a shift to having ITCs available half-time to non-TechSmart schools in the district. ITCs continue to report feeling supported by leadership during the repurposing. Leaders described efforts to repurpose funding resources toward a Tomorrow Bus.

The year-end status report indicated that during SY 18-19, GBSD used non-grant resources to fund both ITCs at full-time. Additionally, as described in the SY 17-18 report, GBSD successfully repurposed their ITCs to make them available across the district, with half-time work at TechSmart schools. This shift was implemented during SY 18-19 and received a variety of responses. Teachers who were interviewed reported that support was still available whenever teachers requested it, but they also reported needing to go out of their way more to gain support. One ITC commented on the change, saying, "We changed our title. It's going to be more innovation coach because we've seen a lot of 'How do you fix my computer?' and troubleshooting stuff. We're really trying to get away from that and be more instructional. I think we'll keep the same model as this year and [work on an] as-needed basis for other buildings. But I have a feeling that as the next year goes on it's going to continue to morph and change. It's going to continue to evolve. But I think we'll still continue as needed because we just simply can't serve everyone. The need is too big."

ITCs who were interviewed reported feeling very supported by leadership. One ITC shared, "I know that [the Director of Teaching and Learning] is really trying to include coaching in her budget every year. It's always hard to really forecast the future with school funding and everything like that. Unfortunately, coaching is one of the first to go if there's not enough money in the budget. But I know that it's something Angie has mentioned again and again as she wants to keep the technology instructional coaches around."

Leaders also described efforts to repurpose funding to support new technology, including significant time and resources toward meeting the goal of 1:1 student devices, as well as a "Tomorrow Bus." The Director of Teaching and Learning shared, "There's some creative funding work. We're getting a Tomorrow Bus, like Beaverton has a Future Bus, that's all STEM and tech learning opportunities in a bus that is supposed to be up and going sometime next year. There's some investment in that, but I don't know the ins and outs of the budget to know where they're moving it from." She also shared more information about where the district is in the implementation process, saying, "It's grown so far beyond K-2 reading, that it tends to go, hey, remember that's what this grant's original focus is. I do appreciate they way they really write into the grant that scaling out and learning from it and growing things is part of it. I think that's really where we are right now."

Strategic Planning

District strategic plan reflects shared commitment to improving outcomes for students.

How does technology integration fit into the district's strategic plan?

Section Highlights:

According to teacher and leader interviews, the district generally continues to support technology integration in its strategic plan, with high support from the relatively new superintendent. However, leaders described added uncertainty during SY 18-19 interviews, stemming in part from leadership changes within the district.

As described in previous sections of this report, GBSD had recent leadership changes, and staff who were interviewed appeared uncertain about how the changes would impact technology integration and the strategic plan. When one ITC was asked if technology fits into the district's strategic plan, they responded, "I feel like it's going to be a part of it, and we hear a lot of lip service toward it. I haven't seen it yet, but I know that it's going to be a part or it should be a part. We have a lot of shifts and changes happening in the district right now with different leaders coming in with new visions and new ideas, and we've felt a part of that process, which has been great. I'm curious to see how our technology plan will fit into all of that work. It right now seems like it's a bit separate, but I know everyone's intention is to have it included."

Another ITC further described the shifts in strategy, saying, "The superintendent did an audit. We've identified some key areas of improvement, and technology was one of them, was an area that was marked as needing more infrastructure, looking at instructional models that include technology. Now we have a new assistant superintendent. She is bringing in some instructional models that haven't really mentioned a lot of technology. I'm curious to see how that all plays out. There's a lot of changes."

The Director of Teaching and learning described a higher level of certainty around support for integrating technology into the district's strategic plan. When asked if technology is part of the district's strategic plan, she said, "Absolutely." She shared that the district now has an Executive Director of Innovations, helping place technology support at the forefront of strategic planning.

Evaluation Insights at Gresham-Barlow School District

The SY 18-19 evaluation at GBSD revealed the following insights:

- The percentage of Cohort 1 students performing at benchmark has been higher than the Comparison Group during all years of the grant. Although the percentage of Cohort 1 students meeting benchmark decreased from 72.8% in spring of kindergarten to 58.8% in the spring of 1st grade, they increased substantially in spring of 2nd grade to 65.8%. Similarly, the percentage of Cohort 2 students performing at benchmark has been higher than the Comparison Group for their first two years of the grant but this Cohort also saw a decrease in the number of students performing at benchmark from Kindergarten to 1st grade. These same trends were true for the at-risk subgroups as well. There were no compelling findings when examining the differences within the TechSmart cohorts.

- Continuing from the last two years of evaluation, teachers and leaders reiterated the value of ITCs for supporting technology integration. Despite a reduction in the number of hours ITCs were available to TechSmart schools (i.e., half-time), teachers expressed appreciation for the knowledge, skills, and abilities ITCs shared. The reduction in ITC availability was reflected in the amount of PD in which each teacher reported engaging. Only 22.7% of teachers reported receiving at least nine hours of group PD during SY 18-19, compared with 80.0% of teachers during SY 17-18. Teachers generally rated group and individual PD as more useful in SY 17-18 than SY 18-19, which may be in part due to having already learned so much in previous years. Teachers and leaders described a strong desire to maintain support from ITCs. Changes in ITC availability stem from efforts to expand support to additional schools within the district, focusing on scaling and sustainability.

- Generally, many areas of focus within grant implementation leveled off somewhat during SY 18-19, at least compared to the substantial growth experienced from the first two grant years. For example, technology use has increased substantially since the beginning of the grant, but growth leveled off in SY 18-19. From the beginning to end of SY 18-19, teachers reported a small decrease in use of digital content and resources, but also reported an increase in students' access to technology in classrooms. It may be that teachers have reached a level of integration that is somewhat saturated, with less room for further growth, or it may be that decreased ITC availability contributed to leveling off and, in some cases, even slight regression.

- While some areas of focus leveled off, others continued to improve substantially. One example was that of leaders' observational ratings of teachers' use of technology, especially to communicate with students, engage students in learning, and demonstrate flexibility and responsiveness. Another area that continued to improve was that of positive impacts on student engagement. Teachers reported benefits of technology for engagement, and survey data showed that students' comfort and abilities with technology increased between the second and third grant year, though at a slower rate of improvement than previous years.

- There is continued evidence of growth and improvement in the previously identified goals of improving use of technology to differentiate instruction and focusing more on subgroup students. Teachers and leaders identified these areas in interviews, emphasizing their importance in the

classroom and the value of technology for meeting differentiation and subgroup goals. The same point was reiterated in survey data, as the most common instructional strategies that teachers reported included use of technology to support small group instruction and to support differentiated instruction. It is clear that teachers continue to successfully focus on these efforts.

- As found during the SY 17-18 evaluation, sustaining and expanding the grant continued to hold district focus during SY 18-19. Within the district, ITCs were repurposed to support more schools, and the district engaged in other funding repurposing efforts to obtain a Tomorrow Bus. GBSD also showed motivation to serve as a leader for other districts, developing many opportunities to build a supportive community. The district worked to host a technology-focused "summer camp" for teachers from at least 15 districts. Other collaborative efforts included continued participation in the East County Technology Consortium, as well as Tech Walks both within and across districts. However, despite clear efforts to support continued technology integration, teachers and leaders described new uncertainty toward the future of technology as a focus of strategic planning. Changes in leadership at the district and school levels contributed to uncertainty toward future priorities and plans.

Project Summary

Portland Public School District (PPS) is highly devoted to improving literacy outcomes for its students and closing the achievement gap for those students from underserved populations. PPS's Equity-Based Balanced Literacy (EBBL) framework was first launched in school year 2016-17 (SY 16-17) for K-5 students and represents an approach to teaching reading and writing. The EBBL framework emphasizes teachers as decision makers, the utilization of students' cultural and linguistic assets, word work and meaning-based instruction, and materials as instructional resources to create caring classrooms where students develop literate identities as readers and writers.

The TechSmart grant project has provided PPS with resources to support the adoption of the EBBL framework, with goals that include: (1) 3rd grade students in PPS pilot classrooms will demonstrate grade-level proficiency in reading, and the achievement gap between typical and underserved students will be eliminated; (2) PPS will understand and implement instructional strategies and practices that leverage technology to provide culturally and linguistically relevant personalized learning; and (3) PPS will validate and disseminate effective instructional strategies and practices that use technology.

Implementation with TechSmart support began in SY 16-17 within kindergarten through 3rd grade classrooms in five schools: Vernon, Sitton, Grout, Lewis, and Bridger. During school year 2017-18 (SY 17-18), PPS expanded the list of TechSmart schools by five to include: Atkinson, Bridlemile, Peninsula, Rigler, and Stevenson. During school year 2018-19 (SY 18-19), PPS included a further five schools: Astor, Cesar Chavez, Forest Park, Glencoe, and Woodstock. By the end of the grant, 20 schools across the district will receive professional development (PD) and pilot the technology infrastructure provided by the funding. PPS's progress after three years of implementation is presented below and is described based on seven essential factors for effective transformation to a technology-rich teaching and learning environment.

Methods

A general description of the methods included in the TechSmart evaluation is provided in the introduction to the full report. Data collection efforts for the SY 18-19 evaluation in PPS are summarized below.

Teacher Survey

PPS administers a teacher technology survey at the end of each school year as part of its internal TechSmart project evaluation. Additionally, teachers are given a survey at the beginning of their first year of TechSmart participation (i.e., SY 16-17 for Cohort 1, SY 17-18 for Cohort 2, and SY 18-19 for Cohort 3). PRE worked with internal staff to add questions to these planned teacher surveys at the end of the year and received access to the resulting data. For Cohort 1, 50 teachers involved in the project completed the baseline survey in fall of SY 16-17, and 13 teachers completed the year-end survey in spring of SY 18-19. For Cohort 2, 77 teachers completed the baseline survey in fall of SY 17-18, and 5 teachers completed the year-end survey in spring of SY 18-19. For Cohort 3, 32 teachers completed the baseline survey in fall of SY 18-19, and 13 teachers completed the year-end survey in spring of SY 18-19. Due to an error in PPS administration of surveys, Cohort 3 also received a baseline survey at the end of SY 17-18, prior to any participation in TechSmart and prior to the intended baseline survey collection, which was meant to take place at the beginning of SY 18-19. Some baseline questions were asked only in this mis-timed survey. Throughout the report, we describe those cases in which data come from the end of SY 17-18 "baseline"

survey instead of the true baseline survey at the start of SY 18-19. Whenever possible, we relied upon ratings and responses from the intended baseline timepoint of the start of SY 18-19.

Teacher Interviews

PRE conducted interviews with ten teachers involved in the TechSmart grant in Portland Public Schools. Interviews were conducted with two teachers from Cohort 1 (Lewis and Vernon schools), five teachers from Cohort 2 (one teacher from Atkinson, Rigler, and Stephenson schools, in addition to two teachers from Peninsula), and two teachers from Cohort 3 (Bridger and Glencoe schools).

District Leader Interviews

In spring of 2019, PRE interviewed 13 district leaders from PPS. Principals who were interviewed included two from each cohort and came from Bridger, Bridlemile, Forest Park, Sitton, Stephenson, and Woodstock schools. Coaches who were interviewed included two from Cohort 1, three from Cohort 2, and two from Cohort 3. Coaches came from Atkinson, Bridger, Bridlemile, Forest Park, Rigler, Sitton, and Woodstock schools.

Leadership Rubric

Four principals and one coach provided ratings of teachers' use of technology using the leadership rubric and "thinking about TechSmart teachers as a whole."

Teacher Observations

A total of 42 observations of individual teachers were conducted by three principals, eight coaches, and the PPS Director of Learning Technologies and were reported on using a brief observational survey form.

Student Achievement Data

In order to examine the impact of the TechSmart grant investment in Portland Public School District, comparative analyses were conducted using two treatment group cohorts and accompanying, concurrent comparison groups. During each of the first two years of the EBBL adoption, ten schools adopted the new literacy curriculum. Five of these schools were TechSmart schools who had access to the new technology or professional development (PD), and five of the schools adopted the new curriculum without technology. One school had to be removed from each comparison group because these schools were assigned by the district to later treatment groups. The five schools assigned to TechSmart represent the Treatment Group Cohort (i.e., Cohort 1 and Cohort 2), while the four non-TechSmart schools represent the Comparison Groups (i.e., Comparison Group 1 and Comparison Group 2). Students who were in kindergarten during the first year of the EBBL adoption (SY 16-17) make up Cohort 1 and Comparison Group 1, and students who were in Kindergarten during the second year of EBBL adoption (SY 17-18) make up Cohort 2 and Comparison Group 2. For SY 18-19, outcomes include ELPA and DIBELS scores for both treatment cohorts and both comparison groups.

DIBELS assessment data are collected for the purpose of informing teachers where their students stand with their odds of achieving certain literacy outcomes. According to researchers from the University of Oregon, reviewing these outcomes is an important step in the Outcomes Driven Model of early literacy problem solving[1]. This model uses assessments like DIBELS as part of a feedback loop that operates

[1] Good, R. H., Kaminski, R. A., Smith, S., Simmons, D., Kame'enui, E., & Wallin, J. (In press). Reviewing outcomes: Using DIBELS to evaluate a school's core curriculum and system of additional intervention in

within each classroom each year, serving as a tool for teachers to reevaluate their lesson plans and strategies. For this reason, the assessment is not designed to compare student achievement across grade levels and should be used as a descriptive tool rather than an evaluative tool. Because DIBELS is the only assessment given to students prior to 3rd grade, we include DIBELS results in this report for descriptive purposes, but we caution against assigning too much weight to these findings across grade levels.

Table 1 presents the number of students in our treatment groups and concurrent comparison groups for SY 16-17, SY 17-18, and SY 18-19, with all sample sizes based on those students with non-missing DIBELS data at each time point. For Cohort 1 and Comparison Group 1, data were available for kindergarten, 1st grade, and 2nd grade years. For Cohort 2 and Comparison Group 2, data were available for kindergarten and 1st grade years.

Table 1. Treatment and Concurrent Comparison Group Sample Size

	Cohort 1	Comparison Group 1	Cohort 2	Comparison Group 2
	N	N	N	N
2016-17	237	170	—	—
2017-18	159	121	127	163
2018-19	109	83	165	67

Figure 1 below presents the at-risk indicators for Cohort 1 and Comparison group students at PPS. Overall, Cohort 2 had lower prevalence of at-risk students within its sample than any of the other three groups. The difference was not substantial for special education (SPED) status, but was more prominent for both limited English proficiency (LEP) and students of color.

Figure 1. PPS At-Risk Indicators

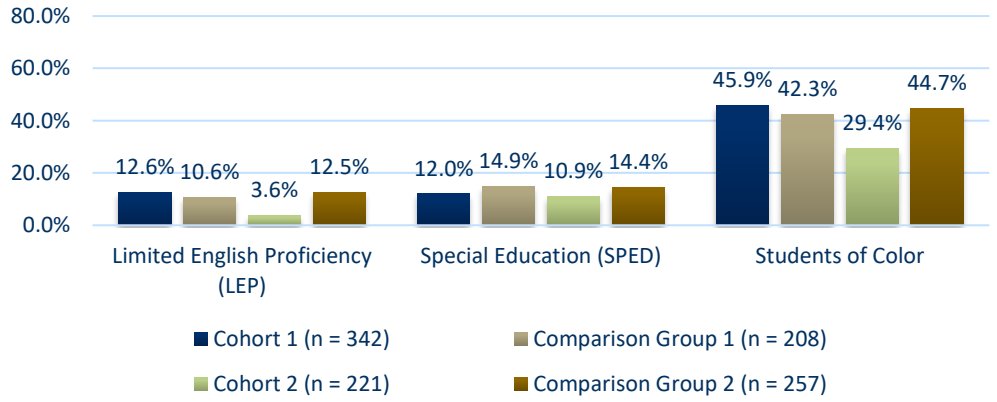
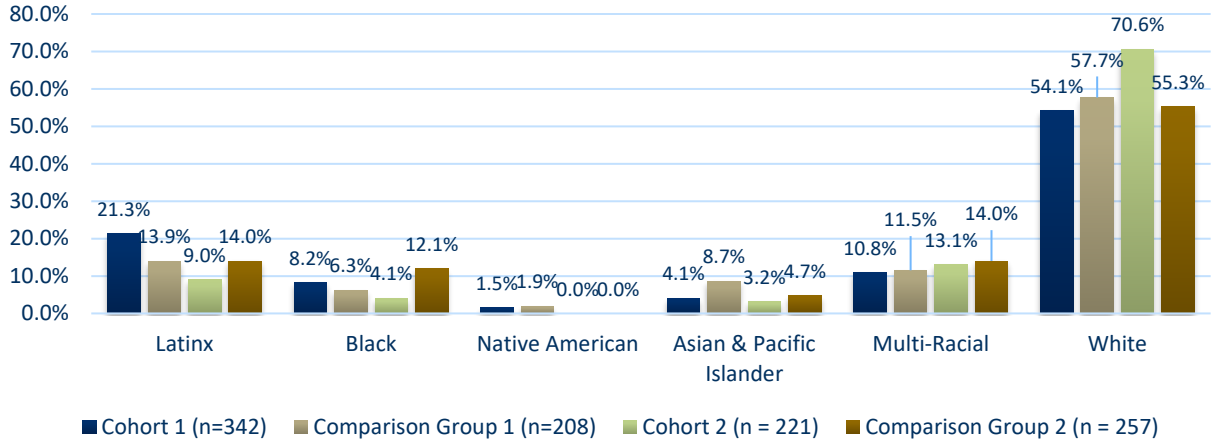


Figure 2 below provides a summary of the breakdown of student race/ethnicity across Cohort 1, Cohort 2, and both treatment groups. Cohort 1 had the highest proportion of Latinx students, while Cohort 2 had the lowest. Comparison Group 2 had the highest proportion of Black students, while Cohort 2 had the lowest. Comparison Group 1 had the highest proportion of Asian and Pacific Islander students. Cohort 2 had the highest proportion of White students, while all other groups were relatively similar for proportion of White students.

kindergarten. In S. R. Vaughn & K. L. Briggs (Eds.), Reading in the classroom: Systems for observing teaching and learning. Baltimore: Paul H. Brookes.

Figure 2. PPS Race/Ethnicity



Findings

The evaluation findings from the SY 18-19 evaluation in Portland Public Schools are presented below and organized by the seven factors identified as essential for schools to effectively transform into technology-rich teaching and learning environments.

Teaching Effectiveness

Districts support regular, inclusive and shared professional development among teachers.

During the third year of TechSmart implementation, PPS offered a variety of PD opportunities for teachers within TechSmart schools. According to the year-end status report for SY 18-19, TechSmart PD activities focused on the following: how best to use devices to support a variety of learning modes; how to use applications and programs for individualized and group instruction; device management in a workshop model; how digital tools and programs support EBBL; and how to engage students using multiple types of digital media. These topics have been covered through the following activities for teachers:

- TechSmart Summer Institute in August 2019, in addition to continuing to onboard and conduct makeup trainings for teachers who were unable to attend
- Embedded PD opportunities from building coaches and vendors, such as teacher-driven collaboration around problems of practice, school leadership-led activities, one-on-one conferencing with coaches, modeling from coaches, and co-planning among teachers, coaches, and administrators
- TechSmart Overview PD session for incoming Cohort 4 teachers
- TechSmart Labs day for three schools from Cohort 4, where teachers and students could observe and participate in demonstration lessons
- Teacher from Rigler school attended Digital & Media Literacy Institute in May 2019 at Teachers College

PD opportunities have also included those designed for coaches, such as:

- Adoption of Google Chat for coaches and central support staff to collaborate on day-to-day issues
- Monthly half-day coach professional learning communities (PLCs)
- Monthly adaptive reaching foundations program implementation manager check-ins
- Training for Flocabularly from vendor
- Co-planning among teachers, coaches, and administrators
- Professional workshops, such as IntegratED and AcceleratED
- Visit to Beaverton School District to observe IlluminatED project and learn about TechSmart Labs
- A total of 12 coaches from Cohorts 1-4 and one district coach attended Digital & Media Literacy Institute in May 2019 at Teachers College

Finally, administrator PD activities for SY 18-19 included:

- Administrator PLC called “Leaders Talk Tech” to focus on technology integration and efficacy

- Director of Learning Technologies and Beach Principal attended Digital & Media Literacy Institute in May 2019 at Teachers College

Table 1 shows that by the end of SY 18-19 more teachers reported having spent time in individual PD than in group PD. This aligns with the year-end report which indicates that, apart from the summer workshop, the majority of district-supported PD occurred in the form of technology coaches push-in to the classroom.

Table 1. PPS Teachers' Hours of PD during SY 18-19

	Cohort 1		Cohort 2		Cohort 3	
Hours of PD	**Group PD (n = 13)**	**Individual PD (n = 13)**	**Group PD (n = 5)**	**Individual PD (n = 4)**	**Group PD (n = 12)**	**Individual PD (n = 12)**
0 hours	23.1%	30.8%	40.0%	0.0%	0.0%	16.7%
1-8 hours	23.1%	46.2%	20.0%	100.0%	41.7%	58.3%
9–16 hours	23.1%	15.4%	40.0%	0.0%	50.0%	16.7%
17–32 hours	7.7%	0.0%	0.0%	0.0%	0.0%	8.3%
33+ hours	23.1%	7.7%	0.0%	0.0%	8.3%	0.0%

The baseline surveys and SY 18-19 year-end surveys asked teachers to rate the usefulness of group and individualized PD. Figure 3 shows teachers' reports of group PD usefulness from baseline across all three cohorts. Note that Cohort 3 baseline ratings for PD usefulness were collected only during the end of SY 17-18, rather than during the expected baseline timepoint at the beginning of SY 18-19. The majority of all three cohorts rated baseline group PD as "not at all," "slightly," or "moderately" useful. Cohort 3 tended to rate group PD as "not at all useful" more frequently than previous cohorts. Ratings of group PD at baseline as "very" and "extremely" useful were very similar across all three cohorts.

Figure 3. PPS Teachers' Ratings of Group PD Usefulness at Baseline

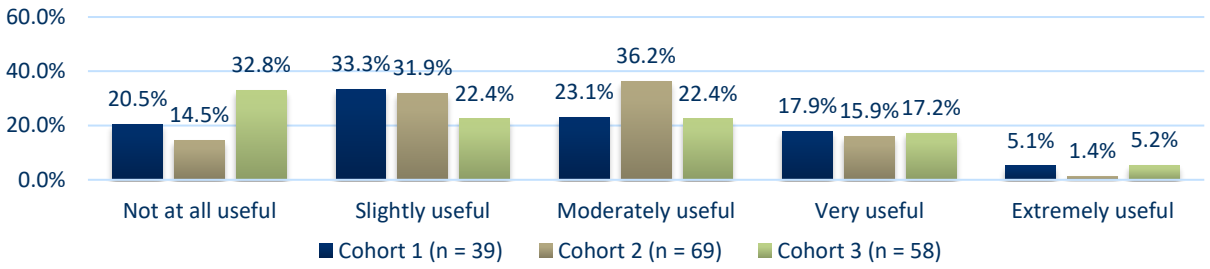


Figure 4 shows teachers' reports of group PD usefulness from SY 18-19 across all three cohorts. Cohort 1, who experienced their third year of TechSmart participation during SY 18-19, showed mix reports of group PD usefulness at the end of SY 18-19, with a few teachers reporting group PD was "not at all useful" but others reporting group PD was "moderately," "very," or "extremely" useful. Reports from Cohort 1 have been mixed since baseline, but reports from Cohort 1 teachers were generally more favorable in SY 18-19 than baseline (SY 16-17) and were more spread out than reports from their second year of participation (SY 17-18).

Cohort 2, who experienced their second year of TechSmart participation during SY 18-19, showed that three of four teachers rated group PD as "slightly useful," with the other teacher rating it as "very useful."

These reports are more or less in line with baseline reports of group PD for Cohort 2 (beginning of SY 16-17), but are more negative than reports of group PD from the end of Cohort 2's first year of participation (end of SY 17-18).

Cohort 3 experienced their first year of TechSmart participation during SY 18-19, and year-end teacher ratings showed that all 12 teachers who responded to the survey from Cohort 3 found group PD "moderately" to "extremely" useful.

Figure 4. PPS Teachers' Ratings of Group PD Usefulness for SY 18-19

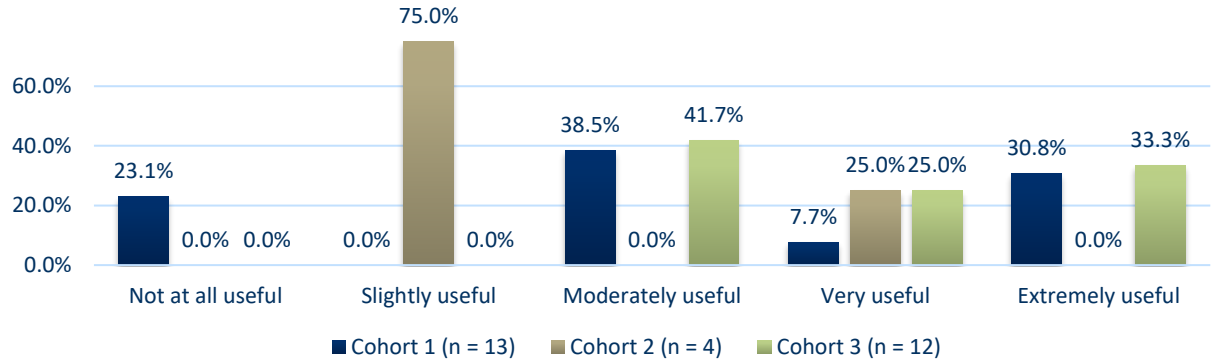


Figure 5 show teachers' ratings of the usefulness of individualized PD at baseline across all three cohorts. Note that Cohort 3 teachers provided baseline ratings at the end of SY 17-18, rather than the intended baseline timepoint, which occurred at the beginning of SY 18-19. Generally, Cohort 2 and Cohort 3 teachers rated individualized PD at baseline as less useful than Cohort 1 teachers. Less than 10% of Cohort 2 and Cohort 3 teachers rated individualized PD as "extremely useful" at baseline, while over 40% of Cohort 2 teachers and over 55% of Cohort 3 teachers rated individualized PD as "not at all useful" at baseline.

Figure 5. PPS Teachers' Ratings of Individualized PD Usefulness at Baseline

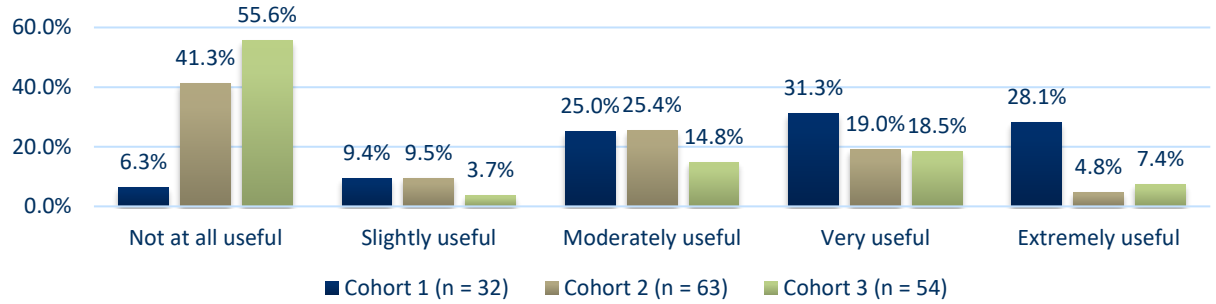
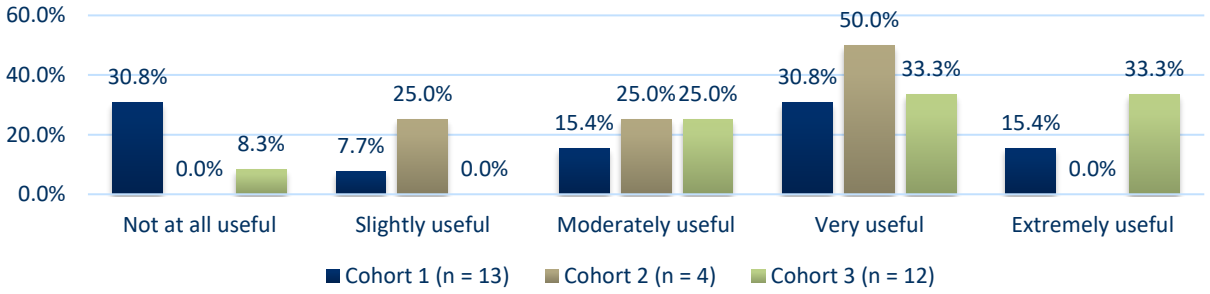


Figure 6 shows teachers' reports of the usefulness of individualized PD from SY 18-19 across all three cohorts. Cohort 1, who experienced their third year of TechSmart participation during SY 18-19, showed a variety of reports, ranging from 30.8% of teachers who said individualized PD was "not at all useful," up to 15.4% of teachers who said that individualized PD was "extremely useful." Ratings were generally distributed similarly to ratings from SY 17-18, but showed a higher percentage of "not at all useful" reports than previous years.

Cohort 2, who experienced their second year of TechSmart participation during SY 18-19, had only four survey responses rating individualized PD usefulness, with one teacher selecting "slightly useful," one teacher selecting "moderately useful," and two teachers selecting "very useful." No teachers selected "not at all useful" or "extremely useful," meaning no responses fell at the ends of the usefulness spectrum, unlike baseline and SY 17-18 reports.

Cohort 3 experienced their first year of TechSmart participation during SY 18-19. Reports of individualized PD usefulness showed that two-thirds of Cohort 3 teachers found individualized PD "very" or "extremely" useful at the end of SY 18-19—a substantial change since baseline. Only one teacher reported individualized PD was "not at all useful," compared to over 55% of teachers who selected that response at baseline.

Figure 6. PPS Teachers' Ratings of Individualized PD Usefulness for SY 18-19



Overall, teachers who were interviewed agreed that coaches are an invaluable part of the PD model. Teachers described many ways the coaches helped with instruction during SY 18-19, such as one-on-one classroom sessions where teachers have opportunities to learn from and observe coaches. One teacher said, "I think that adding the coach was critical to implementing [technology] as much as I have." When asked about the usefulness of PD, one teacher said, "For me, it's been fine because I'm really advocating for it, but for folks that aren't really that into it, I think they won't use it as much." Other teachers, especially those who had been in the TechSmart program for a few years by the end of SY 18-19, described how they had stopped "leaning on" their coaches as much as previous years and were now working more independently.

Another key issue raised by teachers who were interviewed concerns the distribution of PD activities and opportunities. Teachers seemed to agree that part-time coaching was still useful, but some described how the part-time schedule made time management more challenging. One teacher described how coaching can be inconsistent, with coaches present in their classroom only two or three times a month instead of every week, whether due to demands on the coaches or trainings coaches attend. One teacher said, "Part-time is fine, but the problem that sometimes arises is that she has elected to be that part-time person in the morning, but if I have an issue in the afternoon, [the coach is] the librarian. So then I technically can't talk to her about technology in the afternoon because she's not the technology person. She's not wearing that hat." Other teachers found that having coaches be full-time at the school but only working half-time as coaches (e.g., ESL or library work half-time and coaching half-time) meant that coaches are very readily accessible all throughout the day because they are still at school, even when not acting as a coach.

In addition to wider availability, teachers also generally wished for PD opportunities to be spread out more or to have additional follow-up offered. Teachers described how opportunities have diminished, such as former opportunities to work in after-school sessions that teachers could be paid to participate in. Other teachers described how PD opportunities change throughout the year. For example, one teacher said:

> *I think that [I would like] more time in training, and I think it would be helpful to have something further into the year. I think that we got an idea early in the year about a little bit of that information, and now I think I've finally come back around and am able to integrate it a little bit more. It would be great to have some more follow-up training on next steps.*

Another teacher described efforts to engage teachers in planning opportunities, saying, "I got asked to help figure out ways that we could use TechSmart with units of study for every session of every unit. I thought it was helpful and I thought we created some really great stuff. But we were only given eight hours of one day. We only got through the end of unit one, so there was no follow-through with it. Then, it wasn't accessible to anybody in the district. It was just this weird, random planning day that we were offered." Based on these comments, it appears that PPS is working to offer novel opportunities and experiences for teachers, but consistency could be improved.

How is the professional development impacting teacher instruction?

Section Highlights:

This evaluation question includes the following outcomes: 1) PD has helped teachers increase the use of technology for evidence-based instructional practices, 2) PD has helped teachers use technology to analyze and use data about student learning, and 3) PD has helped teachers use technology to differentiate instruction. Teachers expressed mixed opinions of PD, and there seemed to be a distinction among cohorts. Cohort 1, who completed their third year of TechSmart participation in SY 18-19, expressed consistent desires for more PD, both individualized and group. Cohort 2, who completed their second year of participation, hinted at challenges with sustaining the PD from SY 17-18. Cohort 3, who completed their first year of participation, expressed appreciation for PD, especially individualized PD from coaches. By the end of SY 18-19, all teachers who participated in the year-end survey rated their technology skill at Level 3 or above.

The year-end survey asked teachers to discuss how effective the PD model has been in impacting their instruction, as well as any suggestions for improvement. Teachers described the benefits of PD in helping change their instruction, as well as several suggestions for improving PD implementation. Comments from SY 18-19 are displayed in the tables below, arranged by cohort. Table 2 contains comments from Cohort 1 teachers, Table 3 contains comments from Cohort 2 teachers, and Table 4 contains comments from Cohort 3 teachers.

Cohort 1 teachers expressed mixed opinions about the effectiveness of PD in SY 18-19. Of teachers who provided comments, most shared dissatisfaction with the structure or amount of PD. Some teachers

expressed a desire to have more attention from coaches or seemed to hint that coaches had too many demands from the schools, outside of their TechSmart responsibilities. Other teachers shared comments about needing more training to be able to effectively understand and implement technology in classrooms. One teacher shared frustration with their lack of control over students' device settings.

Table 2. Effectiveness of the PD Model at PPS – Cohort 1

TechSmart coaches should not work for the school but should work for the district in order to have all of their time go to TechSmart activities.
I have added technology apps to my instruction that I would not have known about or how to use.
I was only able to integrate the use of one new tech app this year, which was MyOn. It is still new to me and I find it difficult to navigate. Receiving more than just a one-time training would have been helpful (i.e. ongoing coaching). I have had a lot of learning around Seesaw, but I would need a lot of hand holding to really get going on it. It seems really difficult to get used to. I loved my one-day training. That was very useful, but the lack of organized coaching (integrated PLC time) was hard to deal with. My coach did not coach me at all.
We had a .5 TechSmart coach who did absolutely nothing. She wrote 4-5 brief emails, some of which were just forwarding the TechSmart newsletter. The position was completely wasted in my opinion.
I received the initial training at the beginning of the school year, but was not proficient. Each of the programs has so many options, I would have preferred getting to know one program at a time. I am new the 3rd grade, and the 3rd grade literacy block shifts the amount of time focused on reading and writing. I think more frameworks could be provided to people new to TechSmart from other teachers who have been able to integrate the new EBBL curriculum with the TechSmart pieces.
More access to Spanish tools. More control on modifying settings on Chromebooks (students constantly messed up with settings). Not a big fan of badges. Students lost them frequently and I had to print them often. I came up with an idea to attach them to the Chromebook, but had to spend my own money.

Comments from Cohort 2 teachers were generally more positive than comments from Cohort 1 teachers. Cohort 2 comments hinted at challenges around sustaining the progress Cohort 2 teachers experienced in their first year of TechSmart participation. Teachers expressed desire for more PD requirements and/or opportunities.

Table 3. Effectiveness of the PD Model at PPS-Cohort 2

Initially it was helpful. I think it would be helpful to add more required training during meeting time to have modeled how to include more technology with the writing process...or is it developmentally appropriate for kinders to be keyboarding and/or writing in Google Docs...?
This grant has greatly improved my way of thinking about technology integration and the apps made it adaptable. I think continued professional development with lots of hands-on opportunities to work on it would be beneficial.
TechSmart has brought the need of computer literacy to Stephenson. Our first year was a bit more successful as all the required demands of the new literacy adoption, GVC and EBBL were not a priority. At the present time, staff are learning to balance both.

Cohort 3 teachers, who finished their first year of TechSmart participation during SY 18-19, expressed very positive opinions of PD opportunities and the PD model. Some teachers expressed a desire for more training. Teachers shared particular appreciation for individualized PD from coaches, especially when compared with group PD.

Table 4. Effectiveness of the PD Model at PPS-Cohort 3

It has been wonderful. I would love more opportunities to learn about the different apps and programs. I would love to observe technology integration in other kindergarten classrooms.
I would love to get more examples of how to specifically use the applications.
Our tech smart coach was terrific, so much better than whole group Professional Development. Hire more classroom teachers to be tech smart coaches not technology only folks. The classroom experience of a coach makes a huge difference in the success of classroom implementation.
It has added an element of differentiation and assessment.
I appreciated individualized and team-based support. I found this more effective than whole group PD.
The professional development opportunities have been crucial to me using the programs. There is so much to learn that I wouldn't take the time or get frustrated not knowing what I was doing without the opportunities. Our TechSmart coach has been extremely helpful in introducing programs and assisting when we are ready for the next step.

The baseline and year-end surveys asked teachers to rate the extent to which they use technology to support new methods of instruction in their classrooms, according to the Substitution Augmentation Modification Redefinition (SAMR) model. The SAMR model provides a way to examine how technology might impact teaching and learning. It also shows a progression that adopters of educational technology often follow through teaching and learning with technology.

Figure 7 shows baseline ratings across all three cohorts (i.e., beginning of SY 16-17 for Cohort 1 teachers, beginning of SY 17-18 for Cohort 2 teachers, and beginning of SY 18-19 for Cohort 3 teachers). Figure 8 shows end of SY 18-19 ratings across all three cohorts (i.e., end of year 1 participation for Cohort 1 teachers, end of year 2 participation for Cohort 2 teachers, and end of year 3 participation for Cohort 3 teachers). At baseline, Cohort 3 teachers rated their integration of technology substantially higher than previous cohorts had rated themselves before starting TechSmart participation. At the end of SY 18-19, Cohort 2 teachers showed the highest ratings for three of four categories.

Comparing each cohort from baseline to the end of SY 18-19, all teachers provided higher ratings of technology integration at the end of SY 18-19 than they had at baseline, with the sole exception of Cohort 3 teachers' ratings of how often they use technology to redesign a task, which was higher at baseline than follow-up. It is important to note that sample sizes were substantially smaller at the end of SY 18-19 follow-up than sample sizes at baseline for all cohorts.

Figure 7. PPS Technology Integration According to SAMR Model at Baseline
(% At Least Once per Week or More)

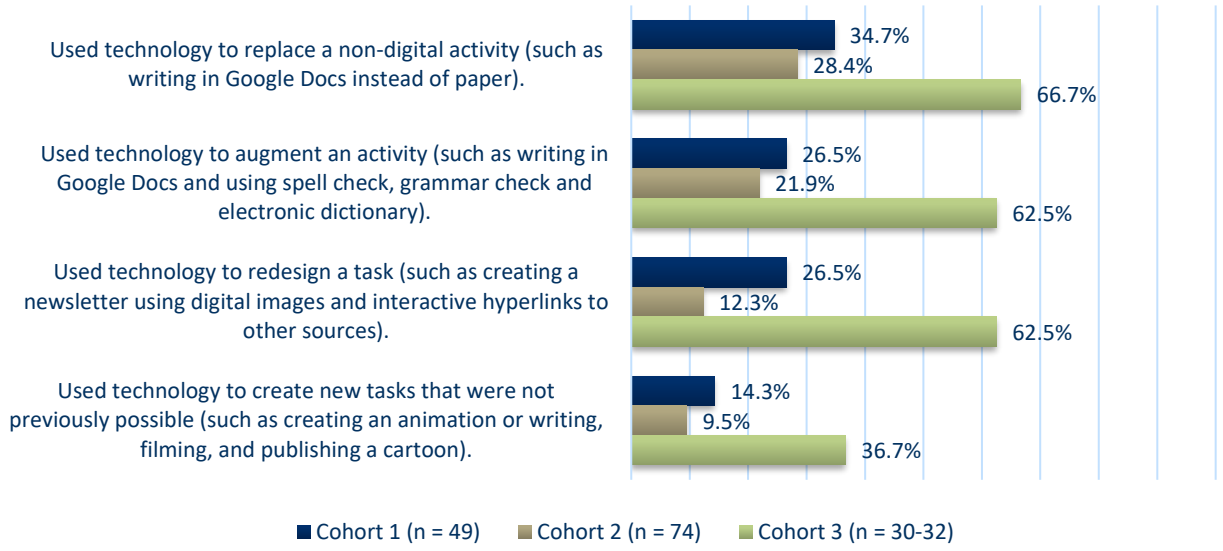
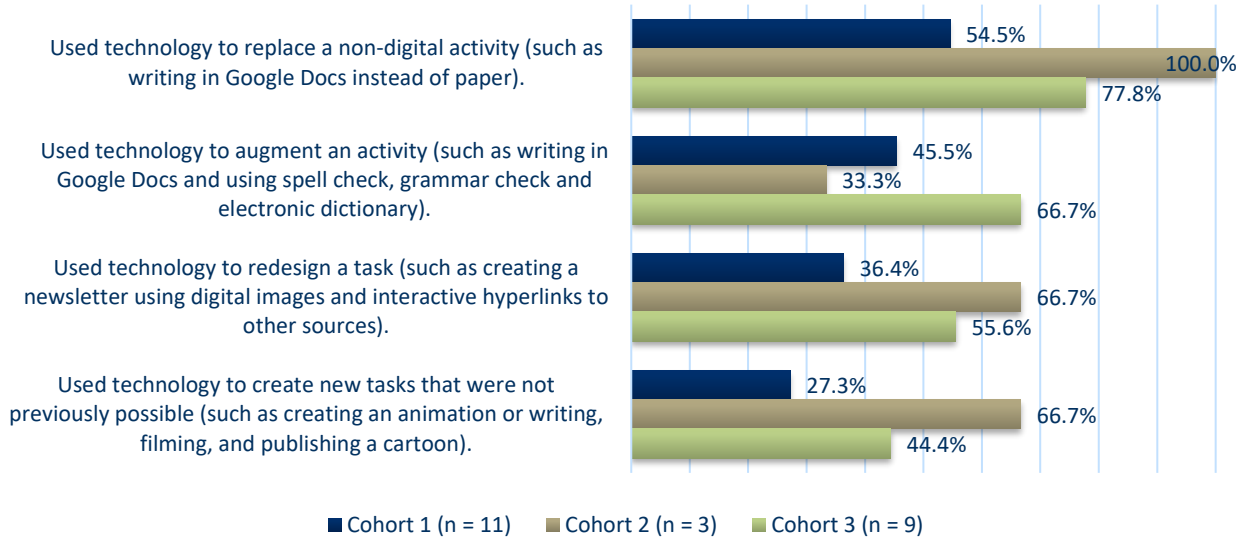


Figure 8. PPS Technology Integration According to SAMR Model for SY 18-19
(% At Least Once per Week or More)



Figures 9 and 10 present a series of survey items related to technology integration, with Figure 9 showing ratings for all three cohorts at baseline and Figure 10 showing ratings for all three cohorts at the end of SY 18-19. Comparing cohorts within each time point, Cohort 3 teachers rated themselves higher at baseline than either of the other cohorts for all items except the item measuring how much teachers seek out activities that promote increased problem solving and critical thinking. Cohort 1 and Cohort 2 teachers both generally showed higher ratings at the end of SY 18-19 than Cohort 3 teachers, which likely reflects the longer period of time that Cohort 1 and Cohort 2 have been participating in TechSmart, as compared to Cohort 3 who began participating at the beginning of SY 18-19.

Comparing each cohort across time, Cohort 1 teachers showed higher ratings for all four items than ratings during both baseline and the previous year's report, indicating continued growth trends from the start of their TechSmart participation at the beginning of SY 16-17 to the end of SY 18-19. Cohort 2 teachers also showed higher ratings for all four items than they did at baseline, as well as higher ratings for all but one item (i.e., seeking out activities that promote problem solving and critical thinking) when compared to the end of SY 17-18. This indicates that Cohort 2 teachers are also generally on a trend of continual growth. On the other hand, Cohort 3 teachers showed different trends than previous cohorts. Ratings from Cohort 3 teachers decreased from beginning of SY 18-19 to end of SY 18-19 for all but one item (i.e., seeking out activities that promote problem solving and critical thinking). It is important to note that sample sizes were smaller for SY 18-19 than previous years, which may play a role in trends within the data.

Figure 9. PPS District Teaching Instruction at Baseline
(% True of Me/Very True of Me)

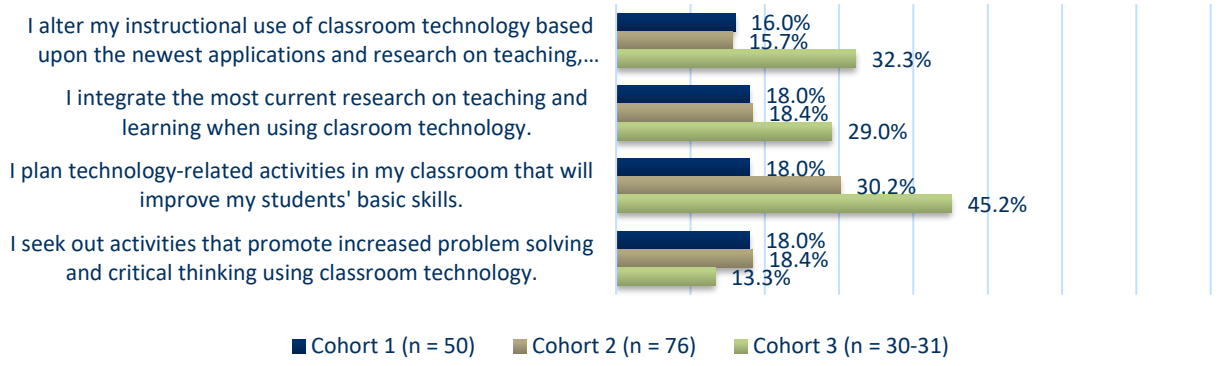
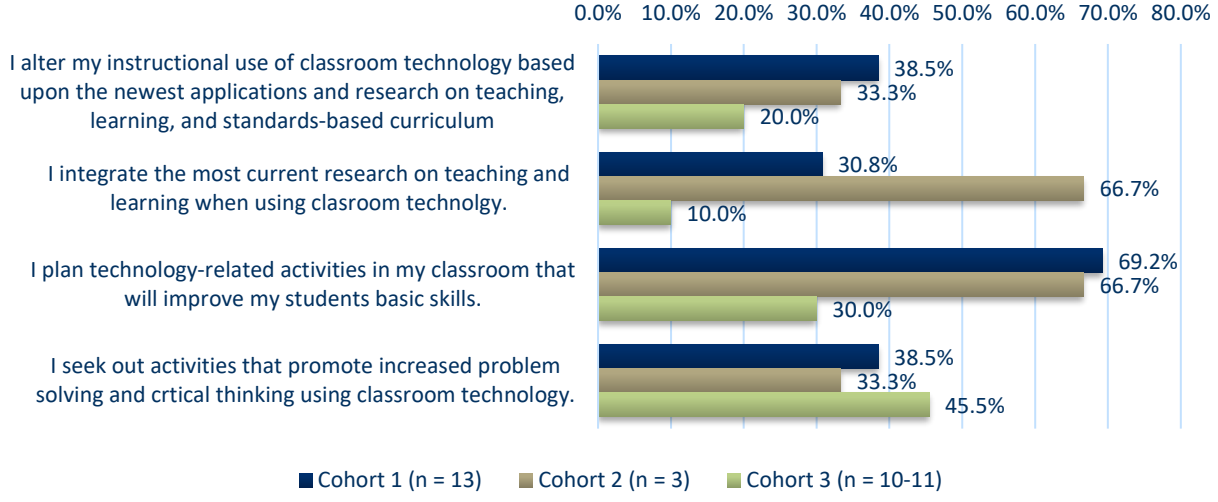


Figure 10. PPS District Teaching Instruction for SY 18-19
(% True of Me/Very True of Me)



Teachers rated their technology skill level on the baseline and year-end surveys according to the following five levels:

Level 1: I get someone else to do technology-based tasks for me.

Level 2: I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job.

Level 3: I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose.

Level 4: I use a variety of technology tools and I use them efficiently for all aspects of my job.

Level 5: I use technology efficiently, effectively, and in creative ways to accomplish my job.

Figure 11 shows teachers' technology skill self-ratings at baseline across all three cohorts. Note that Cohort 3 ratings were collected during the year-end SY 17-18 survey, rather than the intended baseline timepoint of the beginning of SY 18-19. At baseline, the majority of teachers rated themselves at a Level 3 and or Level 4 across all three cohorts. Cohort 3 teachers rated themselves at Level 5 at baseline more frequently than teachers from other cohorts. No Cohort 3 teachers rated themselves at Level 1 at baseline, while only a few teachers from Cohort 2 and Cohort 3 selected Level 1.

Figure 11. PPS Teacher Technology Skill Levels at Baseline

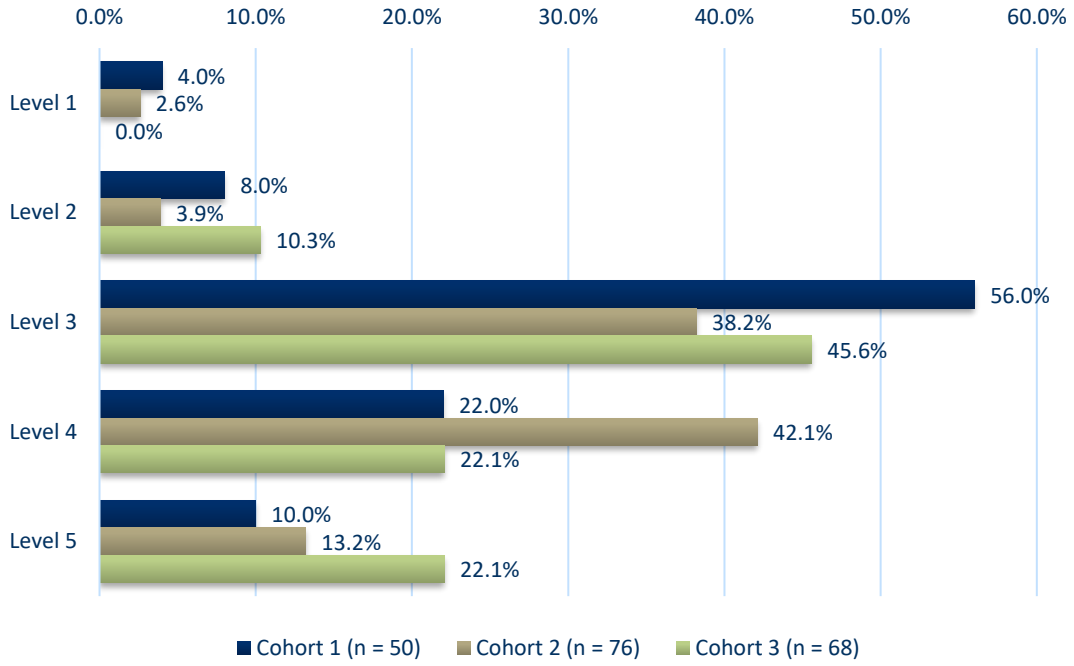
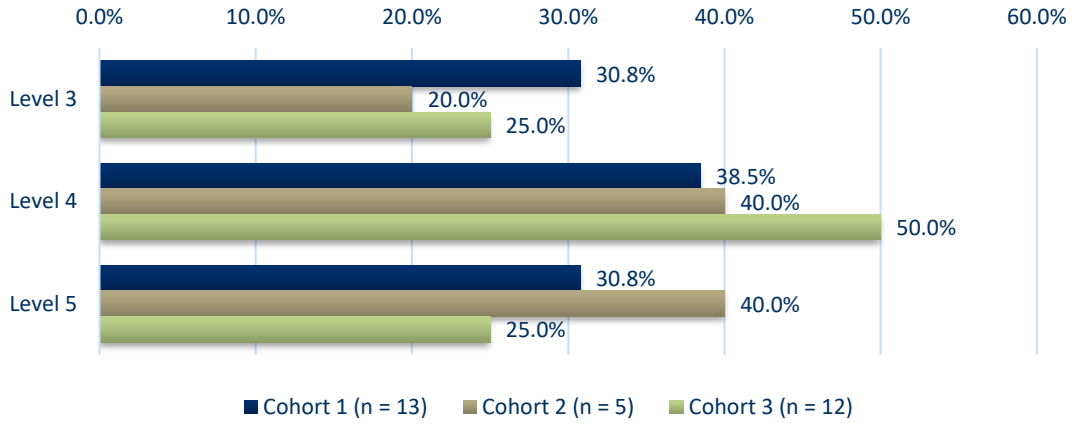


Figure 12 shows teachers' technology skill self-ratings at the end of SY 18-19 across all three cohorts. No teachers from any cohort selected Level 1 or Level 2 during their year-end self-ratings, though year-end sample sizes were substantially lower than baseline sample sizes. Cohort 1 teachers, who completed their third year of TechSmart participation in SY 18-19, most often selected Level 4, but ratings were relatively even across Levels 3, 4, and 5. Cohort 2 teachers, who completed their second year of participation during SY 18-19, were equally likely to rate themselves at Level 4 and Level 5, with only one teacher selecting Level 3. Half of Cohort 3 teachers, who completed their first year of participation during SY 18-19,

selected Level 4, with the other half split between Level 3 and Level 5 ratings. General trends across all cohorts indicated growth in teacher self-rated technology skill from baseline to SY 18-19.

Figure 12. PPS Teacher Technology Skill Levels for SY 18-19



What new instructional strategies are teachers reporting?

Section Highlights:

Similar to past reports, many teachers continue to work to implement new instructional strategies. Lexia was frequently referenced as a useful tool, as well as Seesaw, Book Creator, and Google Classroom. Lexia was generally rated higher than myON across all three cohorts. Like SY 17-18, teachers in SY 18-19 reported most commonly using technology successfully to engage students in learning and for planning and preparation. Leaders also rated teachers' use of technology to engage students in learning particularly highly.

The primary instructional changes have taken place through the use of Lexia and myON, the applications used with the Chromebooks to support EBBL. Leaders and teachers who were interviewed expressed that these programs and tools have been very helpful for changing and improving instruction. One Cohort 2 leader explained:

> *I think [the teachers] are more aware of how to best use the tools and programs. It's evident by my observations the comfort of teachers and being able to work with students with more consistency and with fidelity, versus the prior year where it was such a new learning curve for them. [….] I hope it continues because we're so much further—even though they're baby steps further—than we were just two years ago in using technology in the classroom and being provided with the tools.*

Lexia Reading Core5 supports educators in providing differentiated literacy instruction for students of all abilities in grades pre-K–5. Lexia's program provides explicit, systematic, personalized learning in the six areas of reading instruction, targeting skill gaps as they emerge, and providing teachers with the data and student-specific resources they need for individual or small-group instruction. myON is a personalized literacy environment that incorporates: 1) A state-of-the art learning platform, 2) Enhanced digital reading

content, 3) Daily news articles written for students, 4) The Lexile® Framework for Reading, 5) Cutting-edge literacy tool, and 6) Embedded metrics to monitor activity and growth. Several leaders who were interviewed commented on the usefulness of Lexia in particular, citing the value of the "assessments" or "diagnostics" for differentiating among students' needs. Three other programs that were mentioned frequently included Seesaw, Google Classroom, and Book Creator.

When asked on the year-end survey whether Lexia was used during the school year, 72.7% of Cohort 1 teachers, 100.0% of Cohort 2 teachers, and 100.0% of Cohort 3 teachers reported using Lexia. When asked about myON use, 63.6% of Cohort 1 teachers, 100.0% of Cohort 2 teachers, and 75.0% of Cohort 3 teachers reported using myON. Teachers who reported using either of these applications were asked to rate their agreement with a series of items relating to the benefits of the instructional tools. Ratings are displayed in Table 6. Teachers were asked to rate the items on a Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Generally, teachers rated Lexia substantially higher than myON, especially teachers from Cohort 1 and Cohort 3. The primary exception was that teachers in all cohorts rated myON somewhat higher when considering the degree to which each program "cultivates digital literacy and digital citizenship." Cohort 2 teachers tended to rate myON higher than Lexia across more categories than the other two cohorts, but these ratings are based on only three Cohort 2 teachers.

Table 6. Teacher Ratings of Lexia and myON

	Cohort 1 (n = 7-8)		Cohort 2 (n = 3)		Cohort 3 (n = 5-8)	
	Lexia	myON	Lexia	myON	Lexia	myON
The program is aligned with Common Core State Standards.	6.13	4.50	7.00	6.33	6.38	6.20
Use of the program supported student growth and advanced equity work (closing achievement/opportunity gaps).	5.88	4.50	5.67	6.33	6.00	5.60
The program integrates with current core curriculum or provides a compatible progression from current content to new content.	6.00	4.50	5.67	6.33	5.88	5.80
The program interface is student-friendly.	6.50	4.86	6.33	6.33	6.25	5.60
The program interface is culturally relevant.	5.00	4.71	5.67	5.67	5.50	6.00
The program supports personalized and proficiency-based learning for all students.	6.13	4.43	7.00	5.67	6.50	5.60
The program cultivates digital literacy and digital citizenship.	5.13	5.29	6.33	7.00	6.13	6.20
Differentiated supports are evident in the program for Emerging Bilingual, Special Ed, and TAG students.	5.13	4.14	5.67	6.33	6.38	5.00
In the program, students are supported in independent practice to meet or exceed grade level standards with scaffolds and a gradual release model.	5.75	3.86	5.67	4.67	6.38	5.60
The program generates teacher friendly whole class and individual student data.	5.88	3.00	5.67	5.33	6.38	4.60

	Cohort 1 (n = 7-8)		Cohort 2 (n = 3)		Cohort 3 (n = 5-8)	
	Lexia	myON	Lexia	myON	Lexia	myON
The program facilitates teacher planning and implementation of instruction and interventions.	5.88	3.71	7.00	4.33	6.00	4.40
The program is supported by facilitated and/or self-directed PD that is teacher-friendly.	4.88	3.29	6.33	4.00	6.00	4.60
The program assessments elicit direct, observable evidence of the degree to which a student can independently demonstrate the grade level standard.	5.75	3.00	5.67	3.67	5.63	4.80
The program assesses student proficiency using methods that are unbiased and accessible to all students.	5.50	3.29	6.33	4.33	5.88	4.80
The program uses varied modes of assessment (e.g., selected, constructed, extended response items, self-assessments, and performance tasks) to provide teachers with a range of formative and summative data to inform instruction.	5.25	3.29	4.67	3.67	6.13	4.60

While some teachers did report using myON in the classroom, Lexia and Seesaw were mentioned more often in interviews. Teachers frequently described the value of Lexia in particular. One teacher said of Lexia, "That is probably what we use the most, and it's just a super great way for kids to learn. It helps them with their spelling. It helps them with their reading. It helps them with their comprehension." A second teacher described how students rotate through different uses of Lexia, saying, "We have 14 computers and 23 students in my classroom, so it's a rotation where some people will be working on their Lexia packets, others will be doing word games with me, and then the rest will be on Lexia. Then, after 15 or 20 minutes, with the time everyone switches." A third teacher described Lexia's value in terms of differentiation, also mentioning Seesaw as a helpful program.

I think having the Lexia piece has been really effective. The kids love it. And because it's so differentiated and their taste has really been honed that way, I've been able to build off of that and what they're doing there to further differentiate my instruction. So that's been helpful. And then I think, also, the aspect of using Seesaw to really show their learning and to show if they're taking it seriously.

Seesaw was also described in comparison to Lexia and myON by one coach, who said, "This year our district has added in Seesaw as an additional license, and I think that's made a pretty significant impact as well in terms of sort of moving beyond kind of the slightly more passive interactions. With myON, they're kind of reading books visually, and with Lexia they're kind of playing skill-building games. I guess I don't want to say those are only passive, but Seesaw allows teachers to more fully integrate a lot of things in terms of the combination of digital and physical work." Several other leaders expressed satisfaction with Seesaw implementation, including one principal who said, "It's very open-ended. It has

great potential. Another bonus to it is that the student portfolio can be shared with the class, but it can also be shared with families. The families know what's going on. So it has really an amazing potential to do a lot of things. Our music teacher ended up using it a lot and our art teacher."

Table 7 below presents averaged ratings for teachers from each cohort who completed the teacher self-assessment rubric, as well as the average across 5 ratings that were provided by leaders who completed the leadership rubric "thinking about TechSmart teachers as a whole" and 42 ratings that were provided by leaders who participated in behavioral observations. Teachers from all three cohorts rated their use of technology for "planning and preparation" particularly highly, and Cohorts 2 and 3 rated their use of technology for "engaging students in learning" particularly highly. Leader ratings were higher than teachers' self-ratings, with one exception (i.e., Cohort 2 ratings of using technology for "communicating with students"). Leaders' ratings of teachers' use of technology for "engaging students in learning" were especially high, and leader ratings were also high for teachers' use of technology for "planning and preparation," "managing classroom procedures," and "demonstrating flexibility and responsiveness."

Table 7. Technology Used for Supporting Instructional Practices

	Cohort 1 (n = 11)	Cohort 2 (n = 3)	Cohort 3 (n = 8)	Leadership Observations (n = 47)
Planning and Preparation	3.45	3.33	3.25	3.47
Managing Classroom Procedures	2.45	3.00	2.50	3.50
Organizing Physical Space	2.45	2.33	2.63	3.34
Communicating with Students	2.91	3.67	2.75	3.21
Using Questioning and Discussion Techniques	2.73	3.00	2.63	3.09
Engaging Students in Learning	3.09	3.67	3.38	3.87
Using Assessment in Instruction	3.27	2.33	3.00	3.33
Demonstrating Flexibility and Responsiveness	3.18	2.33	2.75	3.57

Another key aspect of instructional practices described by teachers and leaders was that several interview participants mentioned use of the workshop model from EBBL, as well as the "lab model". When asked about examples of instructional strategies being implemented, one principal responded, "The range is pretty far and wide. There have been some primary classrooms that have rarely in the past utilized technology, whereas now we have the workshop model. One of the stations in the workshop is actually utilizing educational apps for students, and there's actually a station set up in the room during the literacy block." One coach mentioned the models as well:

I've been seeing the view from the school level in my school. That has been changing somewhat, moving into the kind of lab model that we've been sort of starting trying to get up. In terms of at my building level, for the last several years it's been pretty instrumental in allowing teachers to be able to really implement the workshop model in literacy curriculum, which is something that the district is trying to move towards. And so it is really having the Chromebooks and having our programs like Lexia and myON kind of providing data in a more automated way—I think that has really

helped teachers considerably, both in terms of the classroom management aspect and then also in terms of being able to gather information to more specifically fine tune their understanding of where each student is at in order to better inform the work they're doing in person and that sort of thing.

How are the new instructional strategies impacting student engagement?

Section Highlights:

Data from SY 18-19 provided evidenced that engagement continues to be positively impacted by technology integration. Teachers described students' enthusiasm for working with technology in the classroom and how student engagement levels indicate that using technology is rewarding for students. They also described how students are engaged with a variety of different programs, including Lexia, myON, and Book Creator. Teacher survey data reflected similar findings, with teachers agreeing that students were comfortable with technology and were able to work independently during SY 18-19.

Similar to previous years, interviews with teachers and leaders from SY 18-19 indicated continued benefits of technology for student engagement. When asked whether technology has impacted engagement, one teacher said of her students, "They're excited. Their energy is that they're happy. There's no complaining. They can't wait for me to stop talking so they can open their Chromebooks and start working. They're just focused. They're really focused, and then they're very productive. When the time is over, it's usually they don't want it to be over. They want to keep working."

Other teachers described how they have used student engagement around technology as a tool or reward. One teacher said, "I could use Lexia as a reward, and they would be really excited about that. The ever-present allure of technology, they really buy into that piece for sure." Another teacher said, "Having strict parameters around technology and when it is used makes them more engaged. When we had a more relaxed classroom last year, it's kind of like they didn't care that they had technology. It was just one more thing that they did. But I use it really strategically, like they don't use it every day or they only use it for certain content areas, so when they do get it they're really excited about it and really engaged with it."

Students seemed to be engaged with a variety of different programs during SY 18-19. One teacher shared, "The Lexia time after lunch is a really exciting time. When I go over the schedule, they all say, 'Yay' – besides a few. The majority of them get on there and are encouraged by it. They ask to use different programs too. Like some will ask to use myON during reading time. If we have enough Chromebooks, I let them do that or on a rotation. The Book Creator was very engaging. What's cool about that is they created their own books, but they wanted to go on and read other students' work, so that's nice for a motivation for reading. It's integrated in the day. It's a minority of the day, but I like that it's there." A coach reiterated this point, saying, "Kids are really loving Lexia and myON. If they don't love one, they love the other."

Figures 13 and 14 present a series of items relating to students' technology use, with Figure 13 representing ratings across all cohorts at baseline and Figure 14 representing ratings across all cohorts at

the end of SY 18-19. Teachers were asked to rate students' comfort with using digital tools for learning, their ability to choose the right tool for their task, and whether students are able to work independently. While sample sizes were small at follow-up, particularly for Cohort 2, all participating teachers across all cohorts agreed that their students were comfortable using digital tools for learning at the end of SY 18-19. Almost all teachers also agreed their students were able to work independently at the end of SY 18-19, with the exception of one teacher from Cohort 3. There was somewhat more variation regarding whether teachers agreed that students could choose the right tool for their task at the end of SY 18-19, but the percentage of teachers who agreed was higher at the end of SY 18-19 than at baseline for all cohorts.

Figure 13. PPS Year-End Student Technology Use at Baseline
(%Somewhat Agree/Strongly Agree)

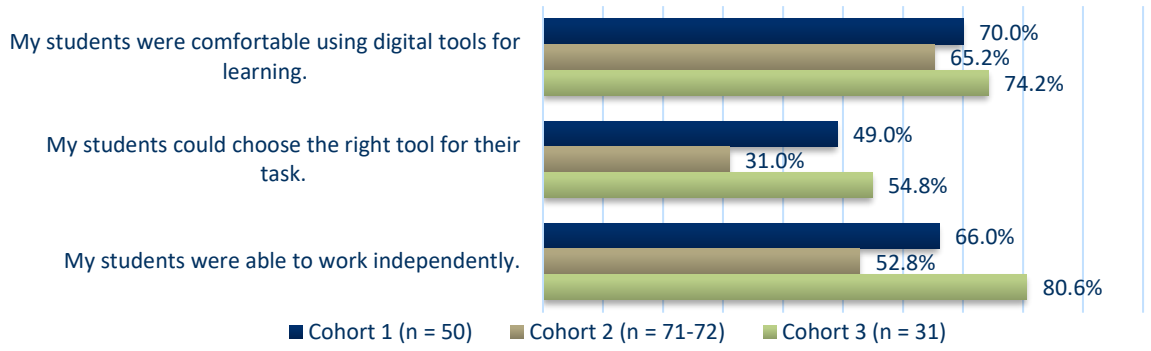
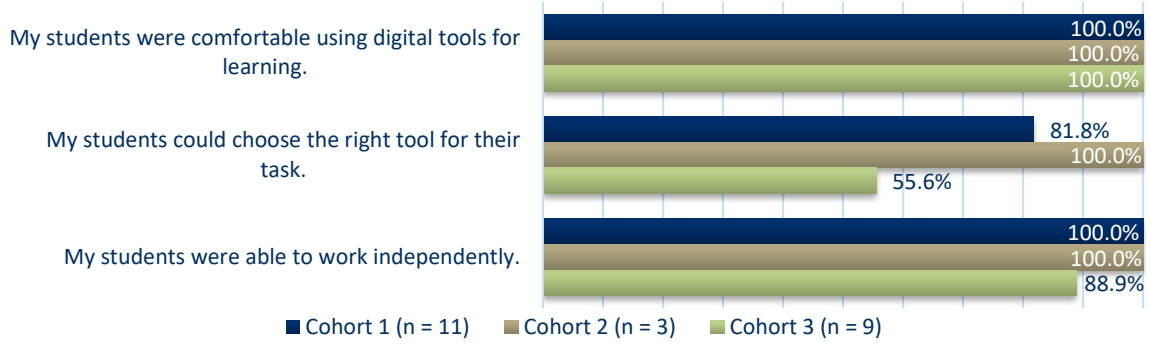


Figure 14. PPS Year-End Student Technology Use for SY 18-19
(% Somewhat Agree/Strongly Agree)



Leaders tied student engagement to the promise they see for technology impacting student outcomes. For example, one coach stated:

> *I think just the kids' excitement about writing has been really awesome to see. You can't really quantify excitement, but they're loving being able to publish their work in book reader, and it's awesome to see. Kids that were really hesitant writers, who could see maybe get a sentence or two out, are writing pages and adding images and are recording. It's just boosted the quality and the quantity of the writing for our kids.*

The year-end status report also shared information about how technology is impacting engagement. For example, the status report described the connection between technology and the workshop model of instruction. The report stated that technology-integrated blended learning is a "natural fit for the workshop model of instruction," and also that the student-to-device ratio has supported "instructional rigor, student engagement, and classroom management."

Are the new instructional strategies showing promise for improving academic outcomes?

Section Highlights:

When interviewed, teachers and leaders generally agreed that they see anecdotal evidence of new instructional strategies showing promise for improving student academic outcomes. Interview participants sometimes discussed the overlap of EBBL and TechSmart implementation. DIBELS assessment data showed promising trends; despite the overall trend from baseline to follow-up indicating decreases in the percentage of students at benchmark for both Comparison Group 1 and Comparison Group 2, both Cohort 1 and Cohort 2 trends showed higher percentages of students at benchmark from baseline to the most recent follow-up.

Teachers and leaders were asked during interviews whether new instructional practices that teachers were implementing were showing promise for improving academic outcomes. The vast majority of those who participated in interviews agreed that the new practices do show promise for improving outcomes and shared anecdotal descriptions of student improvement. Participants acknowledged that it is the combination of technology integration and high-quality instruction that improves outcomes most. One principal emphasized how technology and instruction fit together to benefit students, stating, "I think the technology resources are really a complement to quality instruction. I certainly see [promise for improving academic outcomes] in the classrooms where I have my highest quality teachers, my teachers who are most effective at using the technology and really understand the data and keeping track of what the kids are doing. I've seen a lot of growth."

Similar to SY 17-18, many teachers and leaders discussed the overlap between EBBL and the TechSmart grant. The overlap continues to provide anecdotally supported benefits for students through implementation of the workshop model and other aspects of the EBBL efforts that align well with TechSmart goals; however, the overlap between EBBL and TechSmart also continues to complicate teachers' and leaders' views of the benefits of each program. One coach described improvements in literacy, which might be attributed to the combination of EBBL and TechSmart implementation, sharing:

> *Teachers have told me, especially the kindergarten, first, and second grade teachers are telling me that they're seeing a lot of growth with their kids in reading and some of those foundational skills that they need for reading using Lexia. Kids are reading at home with their parents on myON and, you know, just getting more and more practice. So, I think teachers are feeling like there are gains, and I have seen some gains within the applications. Within Lexia and myON, I can see the levels changing, and I can see our kids moving up in grade level on Lexia and, yeah. Especially after*

using the Lexia lessons and skill builders, the kids are really responding well to those and continuing their practice in each of the applications.

Student Achievement Data

DIBELS

PPS uses the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment for K-3 students. DIBELS are a set of procedures and measures for assessing the acquisition of early literacy skills from Kindergarten through sixth grade. DIBELS assessment data were examined for Cohort 1 students and Comparison Group 1 students from fall 2016 to spring 2019. DIBELS assessment data were examined for Cohort 2 and Comparison Group 2 students from fall 2017 to spring 2019. Figure 15 presents the percentage of students who were at benchmark (Core) on the DIBELS assessments for Cohort 1 and Comparison Group 1, while Figure 16 presents the same data for Cohort 2 and Comparison Group 2. For the first time since the start of the TechSmart grant, the percentage of Cohort 1 students at benchmark on the DIBELS was higher than it's comparison group (by 21.2%). Cohort 2 has been outperforming it's comparison group on the DIBELS assessment since they started with the grant and this difference was largest in 2018-19.

Figure 15. Percentage of students at benchmark on the DIBELS assessment - Cohort 1

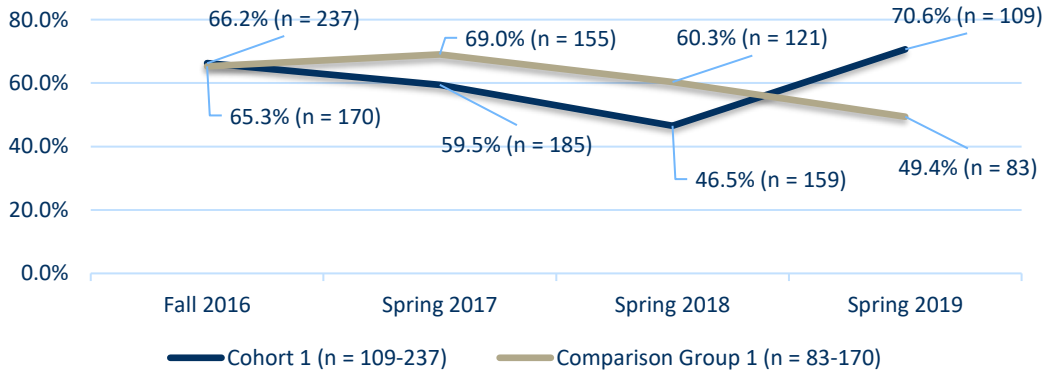
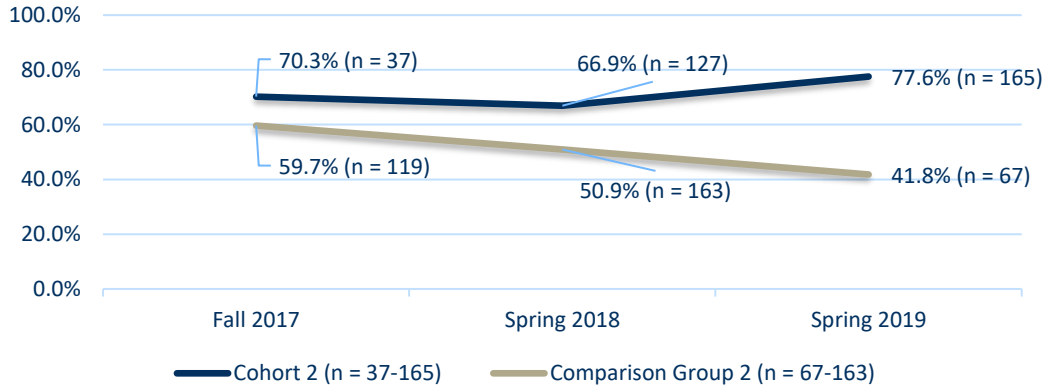


Figure 16. Percentage of students at benchmark on the DIBELS assessment - Cohort 2



Instructional practices show promise for improving student academic outcomes with at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards).

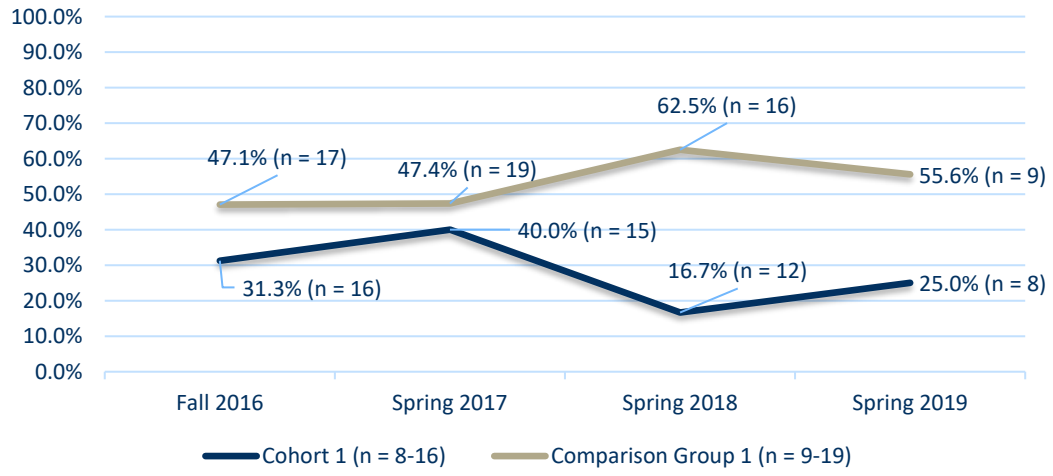
Section Highlights:

Teachers provided examples of their use of technology to differentiate instruction and provide access for at-risk subgroups. Student achievement data indicated variation in performance of different subgroups on the DIBELS assessment over time. Cohort 2 showed particular promise in overall trends, with DIBELS percentages increasing over time for students of color and SPED students. Both cohorts also showed improvement since baseline in percentage of students at benchmark on the IDEL assessment. ELPA scores showed a higher percentage of students scoring above "Emerging" for both cohorts than their respective comparison groups during kindergarten, but not for Cohort 1 in 1st grade (Cohort 2 1st grade data not yet available).

Student Achievement Data

In order to examine whether instructional practices show promise for improving student academic outcomes with at-risk subgroups, DIBELS scores were examined for at-risk subgroups with each cohort. Figure 17 presents the percentage of LEP students who performed at benchmark on the DIBELS assessments at each time point for Cohort 1. While all sample sizes were small, sample sizes in Cohort 2 were too small to include in this report. In general, Cohort 1 percentage of LEP students at benchmark decreased over time, though not substantially. Comparison Group 1 percentage of LEP students at benchmark increased over time, though not substantially.

Figure 17. DIBELS composite growth for TechSmart vs. non-TechSmart LEP students - Cohort 1



Figures 18 and 19 present the percentage of SPED students who tested at benchmark on the DIBELS assessments across time points for Cohort 1 and Cohort 2, with their respective comparison groups. Note that the sample size for Cohort 2 during Fall 2017 was too small to include in this report, so does not appear in the figure. Cohort 1 percentage of SPED students at benchmark changed somewhat over time

but ended approximately the same as baseline by the third follow-up time point. Comparison Group 1 also shifted somewhat over time, but generally increased in percentage of SPED students at benchmark. Cohort 2 had small sample sizes but showed increase in percentage of SPED students at benchmark over time. Comparison Group 2 stayed approximately level, with a dip at the first follow-up time point.

Figure 18. DIBELS composite growth for TechSmart vs. non-TechSmart SPED students - Cohort 1

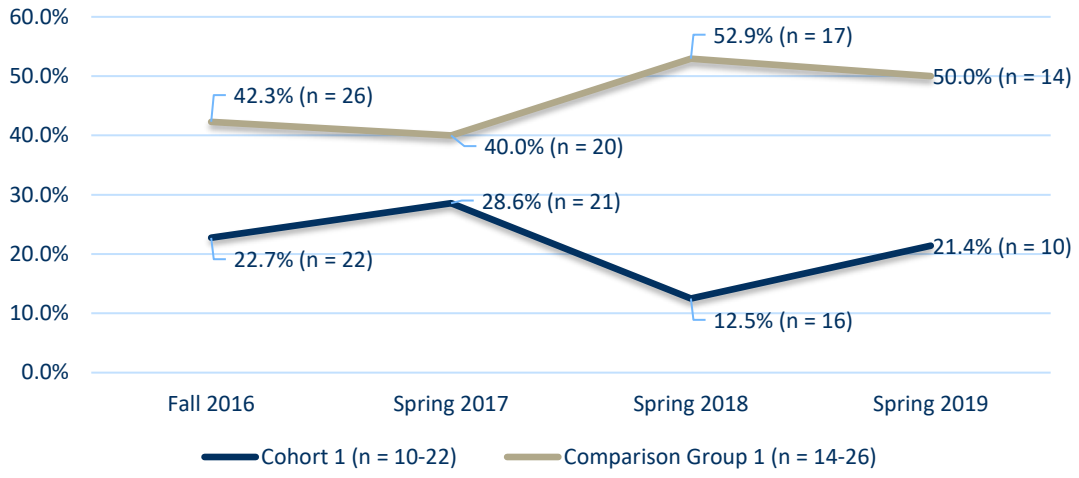
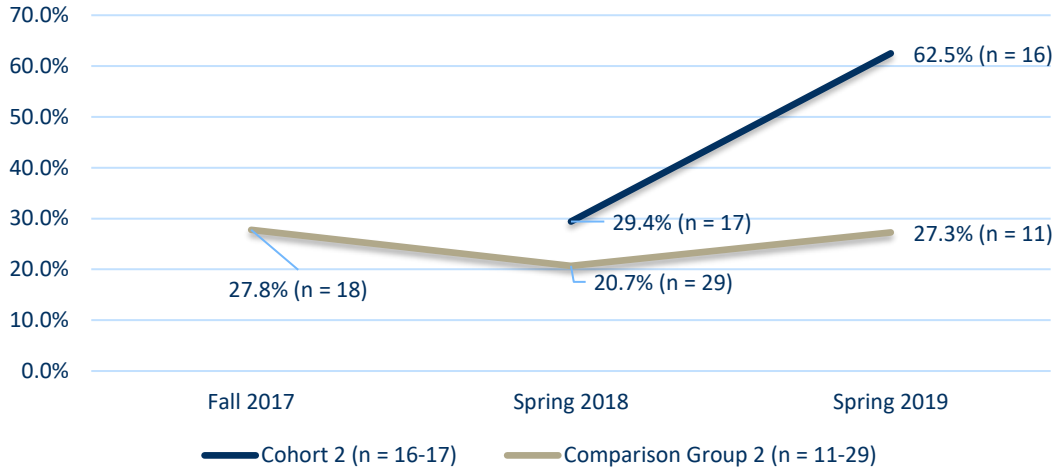


Figure 19. DIBELS composite growth for TechSmart vs. non-TechSmart SPED students - Cohort 2



Figures 20 and 21 present the percentage of students of color who were at benchmark on the DIBELS assessments across all time points, with Figure 20 representing data from Cohort 1 and Figure 21 representing data from Cohort 2. Cohort 1 dipped substantially during Spring 2018, but returned to approximately baseline by Spring 2019. Comparison Group 1 increased slightly for Spring 2017 and 2018 but decreased substantially for Spring 2019. Cohort 2 increased in percentage of students of color who were at benchmark by Spring 2019. Comparison Group 2 decreased in percentage of students of color who were at benchmark over time.

Figure 20. DIBELS composite growth for TechSmart vs. non-TechSmart minority students - Cohort 1

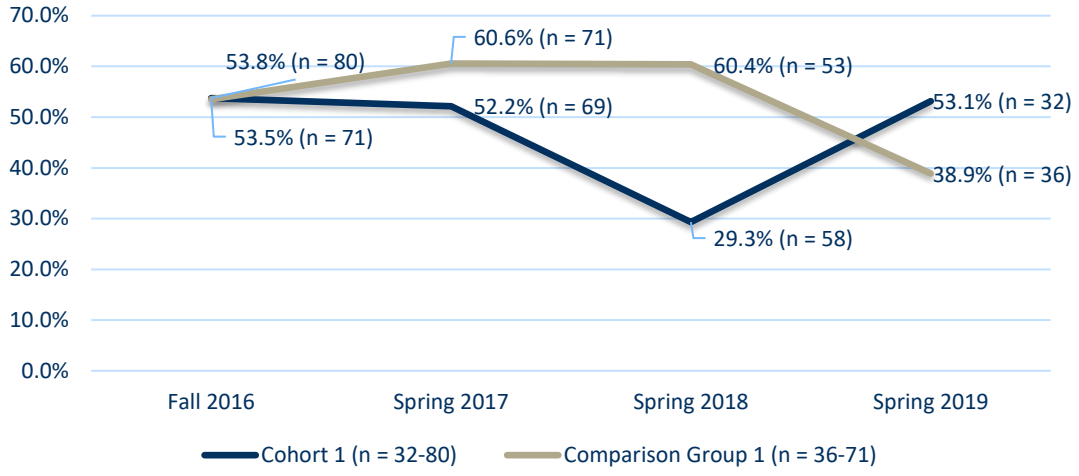
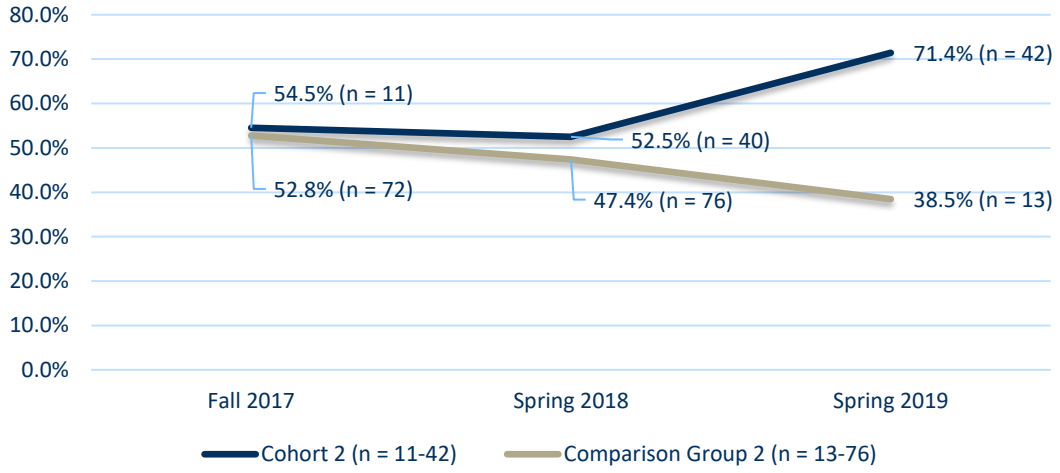


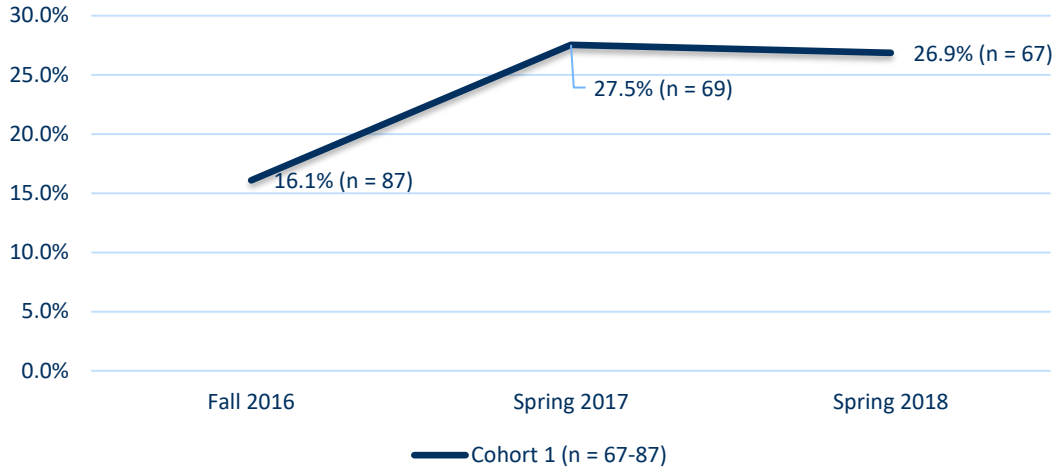
Figure 21. DIBELS composite growth for TechSmart vs. non-TechSmart minority students - Cohort 2



IDEL

IDEL is a formative assessment series designed to measure the basic early literacy skills of children learning to read in Spanish. The IDEL measure, like DIBELS, is a screening tool that includes instructional recommendations and benchmark goals. No IDEL data were provided for Comparison Group 1 or 2 schools. Figure 19 presents the percent of Cohort 1 students scoring at benchmark on the IDEL assessment across time points. Cohort 1 showed overall increases in percentage at benchmark across time. No data were available for Spring 2019 from Cohort 1, and all Cohort 2 sample sizes were too small to include in this report.

Figure 22. Percentage of students at benchmark on the IDEL assessment - Cohort 1



ELPA Assessment

Table 8 below presents the ELPA21 results for Cohort 1 and Comparison Group 1 in kindergarten and 1st grade, as well as for Cohort 2 and Comparison Group 2 in kindergarten. A higher percentage of Cohort 1 students scored above "Emerging" during kindergarten than Comparison Group 1 students, but the opposite was found during 1st grade, with more Comparison Group 1 students scoring above "Emerging" than Cohort 1 students. Cohort 2 students mirrored Cohort 1 in kindergarten, with a higher percentage of Cohort 2 students scoring above "Emerging" than Comparison Group 2 students.

Table 8. ELPA21 Results

Proficiency Determination	Cohort 1 (n = 38-40)	Comparison Group 1 (n = 21-23)	Cohort 2 (n = 8)	Comparison Group 2 (n = 31)
SY 16-17				
Emerging	26.3%	33.3%	—	—
Progressing	73.7%	66.7%	—	—
Proficient	0.0%	0.0%	—	—
SY 17-18				
Emerging	17.5%	4.3%	12.5%	25.8%
Progressing	80.0%	91.4%	75.0%	74.2%
Proficient	2.5%	4.3%	12.5%	0.0%

During interviews, teachers and leaders provided many examples of how technology-supported new instructional practices are showing promise for improving academic outcomes with at-risk subgroups. Several different key factors emerged from responses. First, interview participants emphasized how the presence of technology in the classroom improves equity by providing access to all students equally, unlike students' differing home access levels. One leader said, "Some of our students don't have access to technology in their homes, so by providing that at the school, I feel like that is more trying to have an equitable educational outcome for students, giving them that opportunity."

A second key point that interview participants raised relates to the use of data to assist differentiation among students and provide early warning signs when students may be struggling. One coach shared, “It gives more personalized data as well, so if they don’t know something that becomes very clear very quickly, and there aren’t as many ways to avoid letting that be known. So I think that’s good as well, that it more quickly raises those red flags when students need additional support and additional scaffolding.”

Finally, many interview participants emphasized the benefits of technology for increasing the inclusivity of classroom activities and providing opportunities for students to display their learning in diverse, non-traditional ways. For example, one coach said, “For students with IEPs, the technology has been really helpful. Teachers are using things like voice-to-text on the computer, so students are able to create using the computer. They don't have to rely on writing, and sometimes writing can be a big barrier for students with IEPs. Students can compose directly into a Google Doc or into Seesaw, whereas in the past they might've had to write it. And again, that can often be a barrier.” Another coach expanded on this point, sharing:

> *I think it's helpful because it provides some alternative ways for students to show their learning. And that works on a couple of different ways, especially, I would say, the [dual-language immersion] kids, sometimes they have a story in their head, but they can't just yet write it down all the time. So, using something like Seesaw where they can create a product, and I would say the same thing with Book Creator. When they can create a product that does show their learning even though they might not be able to write it all out, either in English or Spanish yet. I also think another help to that is, especially for kids that maybe have IEPs for attention and/or just some behavior issues just because of trauma, I think that it's another way to reach them and keep them focused, for a little bit anyway. So, it's just an alternative way to reach them and an alternative way for them to show their learning. I think it has been helpful too.*

On the teacher survey, teachers provided examples of how they use technology-supported instruction with at-risk subgroups. Select quotes from these responses are highlighted below in Table 9. Sample sizes were small for each cohort (i.e., five teachers for Cohort 1, two teachers for Cohort 2, and five teachers for Cohort 3), so responses in Table 9 reflect all cohorts combined. Teachers most commonly discussed examples from Lexia, myON, Seesaw, and Google Slides, but mentioned other programs like Zearn, YouTube, and Reading A-Z. When discussing use of Lexia, many teachers emphasized its use for differentiated instruction.

Table 9. PPS Teachers' Use of Technology Supported Instruction with At-Risk Subgroups

Lexia and myON	• *Lexia and myON have provided at-risk students with differentiated materials that keep them engaged.* • *With Lexia and myON, I assigned certain books.* • *I used Lexia to monitor/reteach reading/prereading concepts.* • *Lexia bases their lessons on what individual students need at that moment.* • *Self-differentiated with Lexia.* • *Lexia and the individual lessons to support student needs.*
Audio &Visual Supports	• *When I created my slide show around architecture, I included images of the architects so the students could see themselves represented.* • *When learning math facts, I chose music videos of skip counting specifically targeting my students of color.* • *My ELL students used google slides to present about their bridges. This allowed them to share their slides with their teacher and have the info on the screen while they gave their speeches.* • *Google Slides was an excellent way to help students focus and have prepared questions that target exactly what I wanted to ask. Once a slide show is made it can be reused, but it takes time to make them.* • *I would use YouTube videos to visually show how to apply concepts or introduce new skills. This keeps learners engaged and really helps them see and hear how it's supposed to work before they work independently. It's also great to help with questions and answers they may have.* • *Seesaw – record students reading in their own language for fluency practice.*
Individualized Instruction	• *I used Zearn to differentiate for my SPED kids choosing lessons/levels they needed.* • *I used the MAP test data to target my instruction in reading and math.* • *ELD students have access to the program Reading A-Z, which can be navigated very independently, even for Level 1 students. This is a great resource, and navigates more easily than myON.* • *Helps to differentiate instruction*

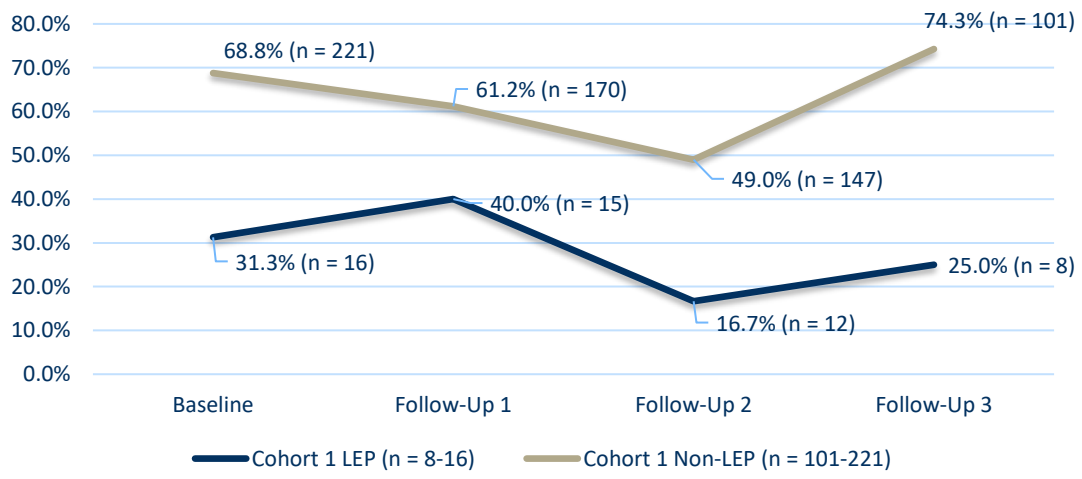
Is the rate of student growth in one or more AHR outcomes greatest for at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards).

Section Highlights:

For Cohort 1, the student achievement data do not provide evidence that the rate of student growth is greater for at-risk student subgroups. However, Cohort 2 SPED students and students of color showed evidence of closing the achievement gap as measured by the DIBELS assessment.

DIBELS data were examined to assess how student progress may differ for at-risk subgroups, when compared to non-at-risk subgroups. Figure 23 presents the percentage of Cohort 1 LEP and non-LEP students performing at benchmark (Core) on the DIBELS assessments across all available time points. Cohort 2 data were also collected, but sample sizes for all groups were less than 7 individuals, meaning results for Cohort 2 are not included below. Within Cohort 1, a higher percentage of non-LEP students scored at benchmark for all time points, with the widest gap at the most recent follow-up (spring 2019). However, sample sizes were small for LEP students, ranging from 8 to 16 students.

Figure 23. DIBELS composite growth for LEP vs. non-LEP TechSmart students - Cohort 1



Figures 24 and 25 present the percentage of SPED and non-SPED students at benchmark for Cohort 1 and at four time points (baseline in fall 2016, as well as follow-ups in spring of 2017, 2018, and 2019), and for Cohort 2 at three time points (baseline in fall 2017, as well as follow-ups in spring of 2018 and 2019). Cohort 2 SPED students are not shown at baseline, as the sample size was only five students, which is too small to include in this report. Cohort 1 non-SPED students showed decreased percentages at the first two follow-up time points, but returned to even higher than baseline by spring 2019. Cohort 1 SPED students showed increased percentages from baseline to spring 2017 and spring 2019, with a dip in between. Cohort 2 non-SPED students stayed relatively stable in percentage at benchmark, while Cohort 2 SPED students showed increases in percentage of SPED students at benchmark across time points.

Figure 24. DIBELS composite growth for SPED vs. non-SPED TechSmart students - Cohort 1

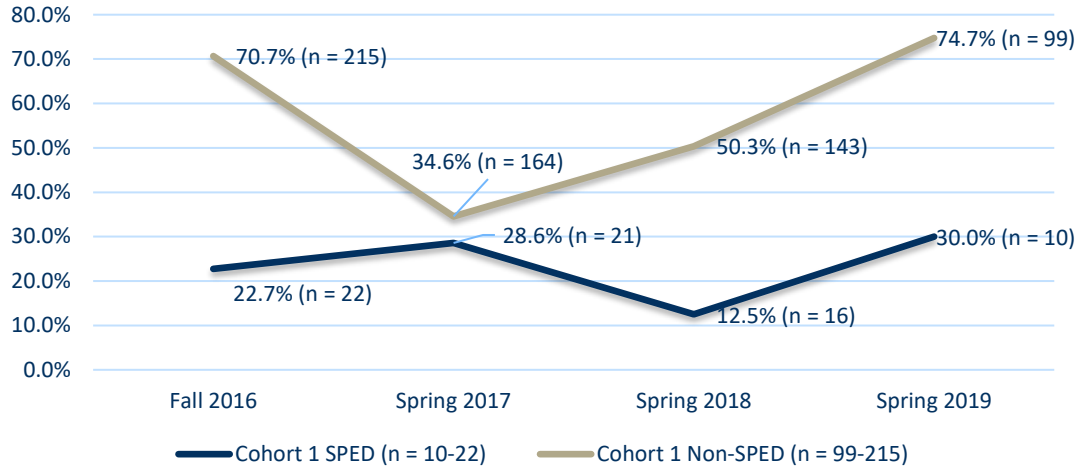
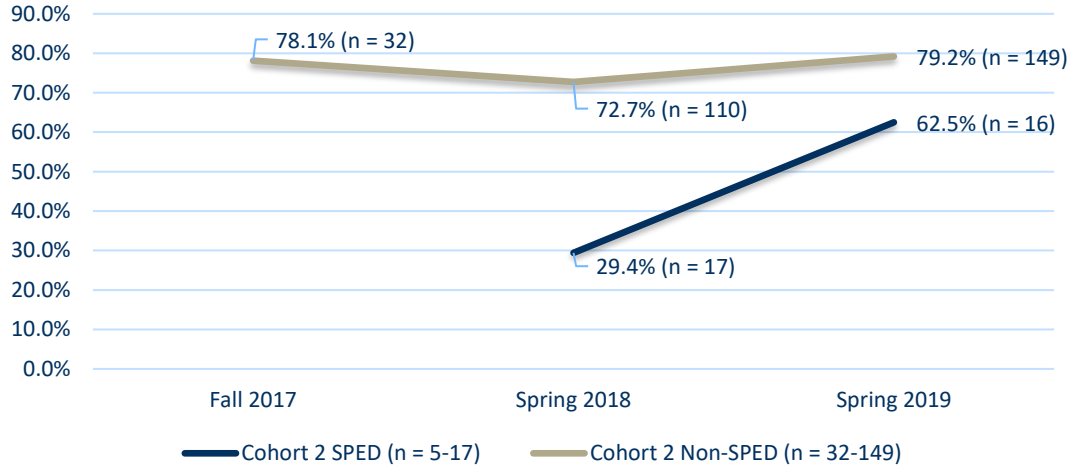


Figure 25. DIBELS composite growth for SPED vs. non-SPED TechSmart students - Cohort 2



Figures 26 and 27 present the percentage of Cohort 1 and Cohort 2 students performing at benchmark for students of color and White students. Cohort 1 students of color showed a dip in percentage of students at benchmark during the second follow-up (spring 2018), but returned to approximately baseline by the third follow-up (spring 2019). Cohort 1 White students decreased in percentage of students at benchmark until the third follow-up (spring 2019), when percentage of students at benchmark rose to a value even higher than baseline. Cohort 2 students of color remained at approximately the same percentage of students at benchmark for the first follow-up (spring 2018), then rose substantially during the second follow-up (spring 2019). Cohort 2 White students stayed approximately level across time.

Figure 26. DIBELS composite growth for students of color vs. White TechSmart students - Cohort 1

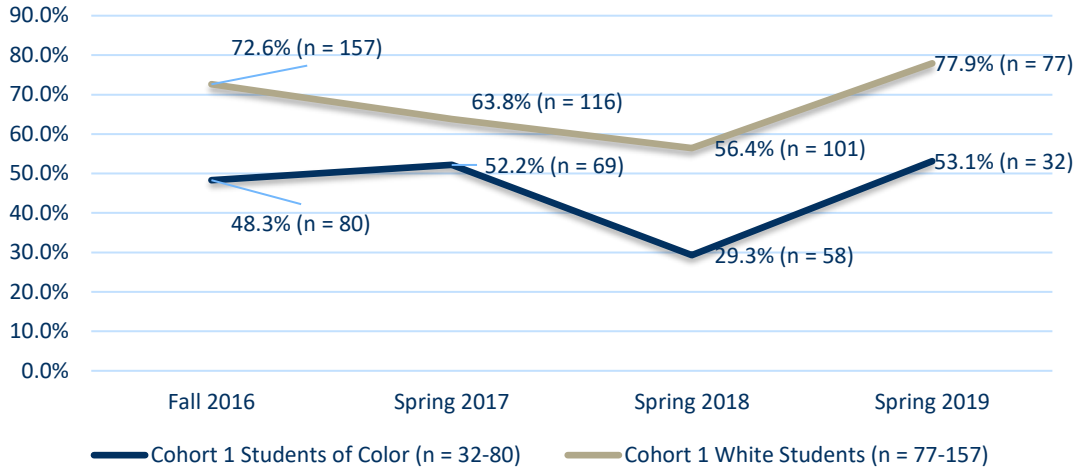
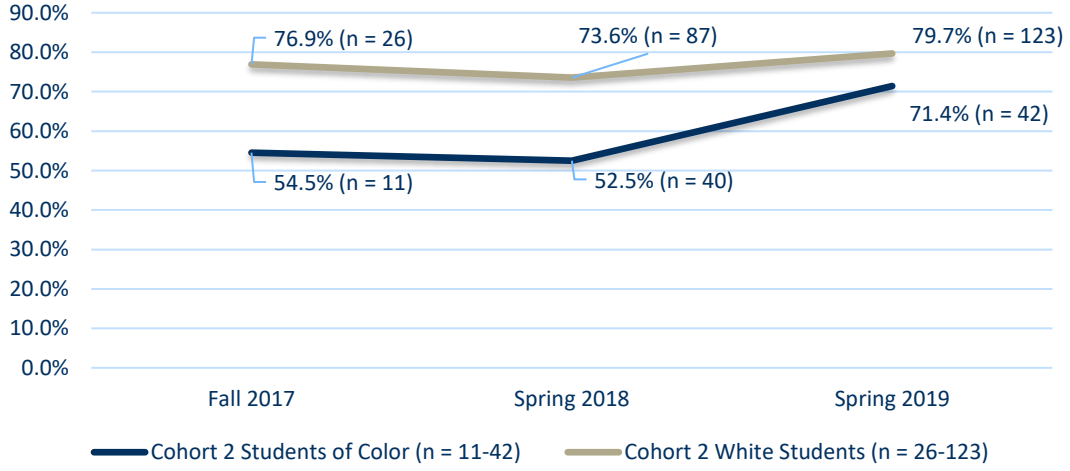


Figure 27. DIBELS composite growth for students of color vs. White TechSmart students - Cohort 2



Digital Age Learning Culture

Districts embrace a cultural shift and view technology as positive.

Has the use of technology to support instructional practices increased?

Section Highlights:

Use of technology to support instructional practices has increased in most cases, based on teachers' reports of frequency of technology integration across all three cohorts. Only two exceptions showed decreases in use of technology from baseline to follow-up, which were Cohort 3 reports of how frequently technology is used to deliver instruction in class and how frequently students work in groups using technology.

As described in previous sections, teachers and coaches shared many examples of increased use of technology to support instructional practices. Furthermore, many leaders and teachers indicated that the culture has shifted to include more frequent, creative, and thoughtful use of technology. For example, one principal who was interviewed shared, "Oh, the culture of technology is widely embedded. Like, a few times this year it's gone down and we've been sort of paralyzed. But it's just used across the day by students, by staff. It's very much integrated, but it's also very much thoughtfully used. We do not have kids on computers all day at all. It's very intentional."

Figures 28 and 29 present teachers' self-reported frequency of technology integration across all three cohorts, with Figure 28 presenting frequency at baseline and Figure 29 presenting frequency during spring of SY 18-19. At baseline, Cohort 1 teachers reported the lowest frequency of integration, followed by Cohort 2 teachers, with Cohort 3 teachers reporting the highest baseline frequency of technology integration of any cohort thus far. During the end of SY 18-19 follow-up survey, all frequencies increased from baseline, with the exception of Cohort 3 reports of how frequently technology is used to deliver instruction in class and how frequently students work in groups using technology, which both decreased. Note that follow-up sample sizes were substantially smaller than baseline sample sizes.

Figure 28. Frequency of Technology Integration Among PPS Teachers at Baseline

(% A Moderate Amount/A Great Deal)

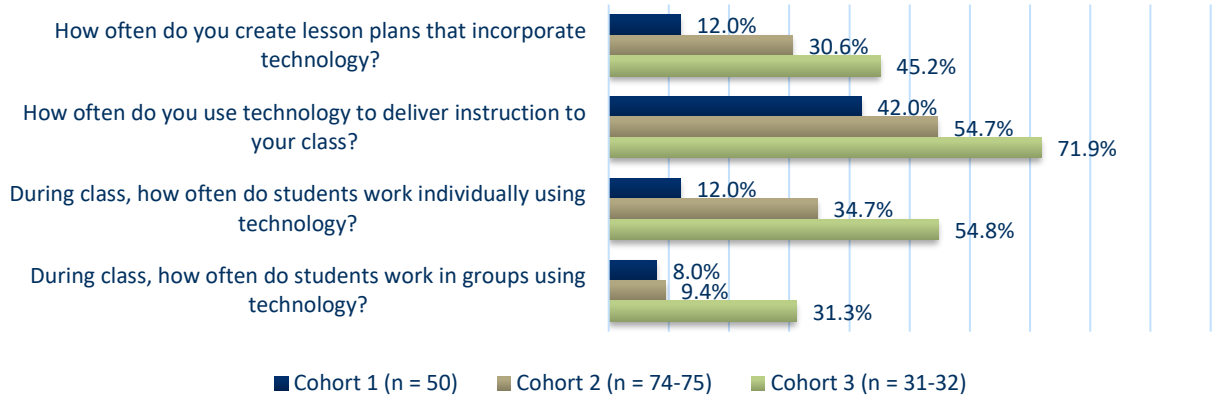
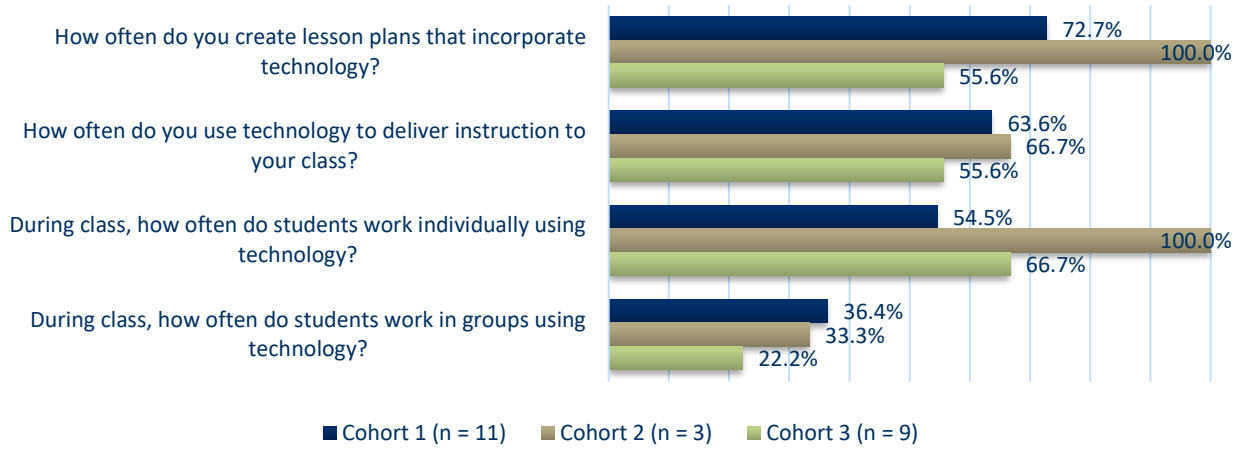


Figure 29. Frequency of Technology Integration Among PPS Teachers for Spring of SY 18-19
(% A Moderate Amount/A Great Deal)



Is the learning management system useful for identifying effective instructional practices (more efficient, easier, data driven)?

PPS use of the Canvas Learning Management System (LMS) was described in the year-end status report, which indicated that the LMS is in use for PD, with an "expanding role." Additionally, a "small sample of early adopters" are using the LMS for student instruction. In SY 18-19, PPS implemented TechSmart Labs, Book Creator, and Seesaw. The year-end status report stated that TechSmart Labs have "proven particularly effective in increasing the level of engagement and collaboration among TechSmart Coaches, Literacy Coaches and TOSAs, and Dual Language TOSAs. Particularly with regards to the DL TOSAs, Labs required the TechSmart team to co-facilitate classroom demonstrations with DL TOSAs who can teach in the target language. Bringing those perspectives has in turn improved mutual understanding of programmatic goals and best practices for modeled instruction." The year-end status report also described how Seesaw has "allowed teachers to create digital lessons and share them among their teams."

Do teachers have increased access to and use of digital content and resources?

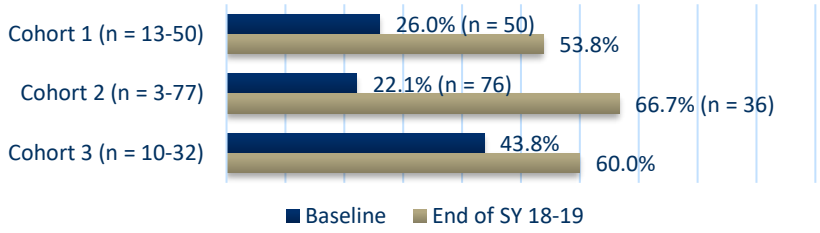
Section Highlights:

At the end of SY 18-19, teachers' reports of adequate student access to technology in their classrooms were substantially higher than at baseline. Teachers listed many examples of instructional practices used in their classrooms, focused primarily on use of Lexia, myON, Google, and Seesaw.

Throughout implementation of TechSmart, teachers have received access to resources, technology, and content to enhance instruction. Teachers were asked to rate students' access to technology in the classroom during baseline and follow-up surveys. Figure 30 shows these ratings, which indicate the extent to which teachers agree that "students have adequate access to technology" in their classrooms. At baseline, 22.1% to 43.8% of teachers selected "true of me" or "very true of me" when rating their classrooms. During the follow-up survey conducted at the end of SY 18-19, these rates rose, ranging from

53.8% to 60.0%. Rates of teacher agreement for Cohort 1 and Cohort 2 decreased somewhat since then end of SY 17-18, but it is also important to note the smaller sample sizes for the SY 18-19 end-of-year survey.

Figure 30. PPS Teacher Reports on Students' Access to Technology
(% True of Me/Very True of Me)



Teachers also provided comments on the use of Lexia, Google, myON, and Seesaw during the year-end survey. Table 10 below presents sample quotes regarding the application of these technologies, with the commenter's cohort listed in parentheses at the end of each quote.

Table 10. PPS Teachers' Use of Technology – Cohorts 1, 2, and 3

Technology	Teachers' Application of Technology
Lexia	• *Lexia is used to differentiate reading instruction and data is used to track growth and report progress to parents. (Cohort 1)* • *Lexia is an outstanding tool in meeting diverse students' needs at individual literacy levels. (Cohort 1)* • *Individualized reading skills can be addressed with Lexia and MyOn while working with small groups of kids to hone in on specific concepts. (Cohort 2)* • *I use Lexia as a short warm up every other day for students that are not getting it in their classroom. I also am able to check in on how my students are doing and provide the extra support that their classroom teacher doesn't always have the time to give. (Cohort 3)* • *We use Lexia daily, and I love how it provides differentiated instruction in literacy foundational skills. (Cohort 3)*
Google	• *The use of Google Slides to present information and activities for the integrated Science/ELD units of instruction. (Cohort 1)* • *Students published writing work using Google Docs through my Google classroom. (Cohort 3)*
myON	• *I received a basic one day training on the apps my students could use, how to set up my classroom page and show my students how to access it. I used that training to learn more about MyOn and I used it to differentiate my reading. I added a bank of Mystery books for my low readers so they could participate in whole group discussions around how mysteries work. It worked really well. (Cohort 1)*

	• *During Words Their Way, one group is usually doing the paper WTW work with me or another adult and another group is doing Lexia or Myon on the Chromebooks. (Cohort 2)* • *Students have access to MyOn during independent reading. (Cohort 3)*
Seesaw	• *Using Seesaw to record student writing. (Cohort 3)* • *Assessment of student created math story problems using Seesaw. (Cohort 3)*

Is there evidence of district-wide support for technology integration?

Section Highlights:

Survey data indicated that culture of support for technology integration improved from baseline to the end of SY 18-19 in two cohorts, but decreased somewhat in another cohort. During interviews, most teachers agreed that the culture supports technology integration, but some disagreed and expressed a need for more support.

Baseline and follow-up surveys asked teachers to rate the extent to which they agree with statements about their school's culture around support for technology. Figure 26 shows teacher reports at baseline across all three cohorts, while Figure 31 shows teacher reports from the year-end survey during SY 18-19. At baseline, Cohort 1 and Cohort 3 showed relatively similar and largely positive ratings of school culture, while Cohort 2 showed lower agreement with statements about perceptions of culture of support for technology. For example, about half of Cohort 1 and Cohort 3 teachers agreed with the statement, "Teachers in this school share an understanding about how technology will be used to enhance learning," while only about 10% of Cohort 2 teachers agreed with the same statement.

Figure 31. PPS Teacher Perceptions of a Culture of Support for Technology Integration at Baseline
(% Agree/Strongly Agree)

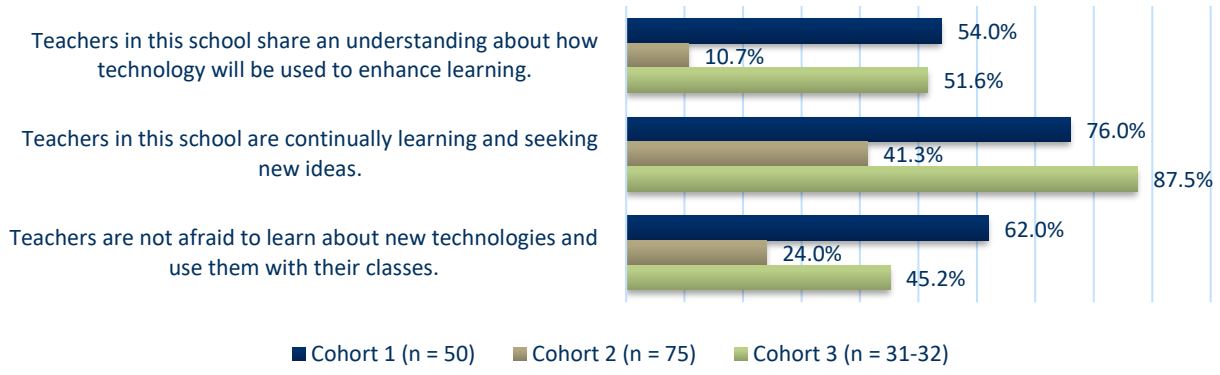
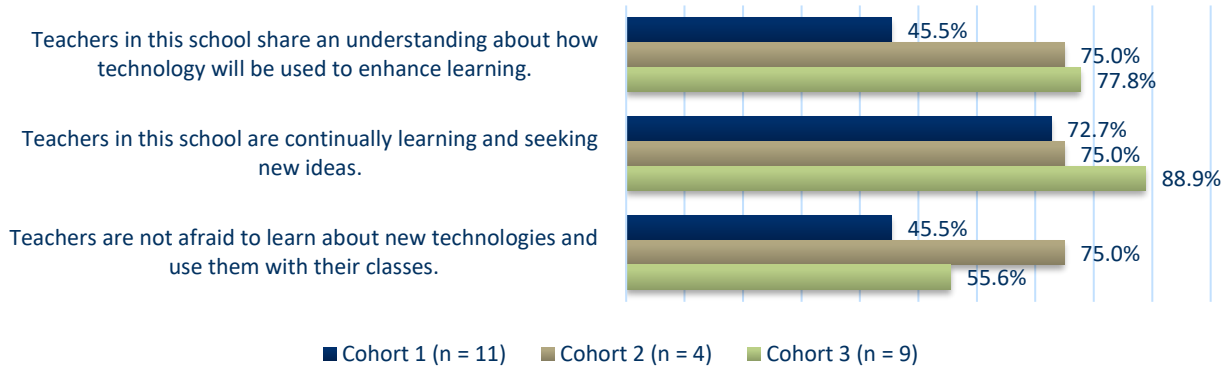


Figure 32 shows that, for both Cohort 2 and Cohort 3 teachers, ratings increased from baseline to the end of SY 18-19 across all three statements. Increases were particularly dramatic in Cohort 2, with percentage of agreement increasing from 33.7-64.3%. However, Cohort 1 teachers showed slightly lower agreement

with statements about school culture at follow-up than at baseline. It is important to note small sample sizes at follow-up, particularly for Cohort 2, which included only four teacher ratings at follow-up.

Figure 32. PPS Teacher Perceptions of a Culture of Support for Technology Integration Following SY 18-19
(% Agree/Strongly Agree)



When asked whether teachers believe there is a culture of support for technology integration during interviews, most teachers responded positively. One teacher said, "Yeah, I think so. I think there's always a few minutes mentioned at PD or at our weekly staff meetings. And I think that, as a whole, some teachers are more excited than others, but I feel like there's support for anyone who needs it, and teams are working together to use it. So, yeah, I think it's overall pretty positive." On the other hand, some teachers disagreed that the culture supported technology integration, attributing the lack of positive culture to difficulty implementing technology integration in non-English classrooms and to a lack of support from and involvement of administration.

Do parents have an increased understanding and utilization of districts' technology assets?

The year-end status report described implementation of Seesaw with dual-language immersion students, a program that allows students' work to be shared with parents, in addition to classmates and other audiences. PPS reported, "For the 18-19 school year, we have had 1,114 family members connect to their child's digital portfolio. There have been 25,794 unique parent visits to view student work and/or teacher communication." Additionally, the report described a number of parent-focused events, which PPS reported occur approximately five times per year per school and include events that are not focused specifically on technology, such as Back to School Night and parent-teacher conferences, as well as some efforts focused on technology, such as newsletters.

During interviews, teachers and leaders described ways that parents are involved in the classroom or in students' work through technology. One leader shared, "[The technology] is really supportive of family interaction, so then when they have the families engaged with it too, I think that's, overall, a nice support for the kids' learning." Teachers and coaches described more specific ways technology and parent involvement work together. One coach said, "That's been great, to have that communication where I could push out to parents and just let them know that my blog photos are posted for the week, or please

don’t forget to make sure your child has their 12 minutes of Lexia, or Library is tomorrow. That’s been a helpful little connection. I’m learning to blog. I take photos during the week, and then I post that, and that bit of technology has been just fantastic for families to see because if they’re not able to come into the classroom, or if grandparents are not around, they can share that, no matter where they are.”

Visible Leadership

District leadership is actively involved and working with key communities to accomplish change.

Are districts identifying effective instructional practices and disseminating information and results to other districts?

Section Highlights:

During SY 18-19, coaches participated in several events that involved other districts, including several conferences. Additionally, the district described several efforts to share information from TechSmart more widely within PPS but across different buildings.

The year-end status report listed several ways that PPS interacted with other districts during SY 18-19. Coaches visited Beaverton School District to "observe the illuminated project, to gain understanding around TechSmart Labs prior to implementation." Additionally, 12 coaches and one district coach attended the Digital & Media Literacy Institute in May 2019 at Teachers College at Columbia University. Finally, two coaches "presented sessions at OETC's annual IntegratED conference in February," coaches "participated in the MHCRC shared learning event in April," and "Astor hosted a site visit for district administrators from across the country as part of the COSN conference in April."

Although the above activities were the only efforts to connect with other districts that were described, the year-end status report described several additional activities within PPS but across buildings. For example, the report described work on TechSmart Labs, "in which TechSmart coaches from across the district conduct technology-rich classroom demonstrations in a single building's K-3 classrooms." TechSmart Labs were conducted in classrooms from Cohort 1 and the upcoming Cohort 4, and the district has set a goal of delivering Labs days "at the remaining 16 TechSmart schools, as well as some Title I schools, in the upcoming school year." PPS described their efforts to invite a videographer to document one TechSmart Labs day, with plans to create a video promoting the Labs program for distribution within and outside of PPS in fall 2019.

Do teachers feel increased support from district leaders regarding technology integration?

Section Highlights:

During interviews, participating leaders and teachers shared mixed views of support from district- and building-level leaders. In general, teachers reported support from principals and other building-level leaders. Many participants also expressed positive experiences with both the teacher on special assignment (TOSA) for TechSmart and the newly-hired Director of Learning Technologies. However, most other descriptions of district-level support indicated need for improvement.

During interviews, teachers and leaders described a variety of opinions and experiences regarding support from district leadership. One teacher expressed difficulty with differentiating between district-level support and building-level support; others may share this confusion, as perceptions of support seemed to vary substantially across buildings, despite belonging to the same district.

Reports regarding district support for the physical technology resources were mixed. One teacher expressed that the district has improved its ability to provide new parts and repairs, saying, "Another piece of it, having it be Chromebooks—I know they're pretty inexpensive—is if I've had pieces that are missing, because, you know, they're first graders and it just happens, or headphones that aren't working, I feel like I can turn them in to the TechSmart coach, she turns them in to the district, and I get new stuff, at least now, pretty quickly. I think that's a piece that, historically in our district, is tough, is, 'Oh, here's this cool new thing,' and what happens when it breaks and it's done? You know what I mean? So I feel like that's a really important piece just as a whole, is what are you going to do to maintain? Are you going to purchase new Chromebooks? That kind of stuff. So I feel they've been really responsive to those things, which is important." On the other hand, when discussing sustainability, one of the most frequently raised concerns or fears was that the district would not be able to continue to provide support once TechSmart funding ends.

Another common theme from interview responses was the value of the newly hired Director of Learning Technologies. Even those participants who did not feel supported by the district as a whole shared excitement about the Director position. One principal said, "I think last year was a lot better, whereas this year I don't think the district leadership was consistent for most of the year. But I know that's going to get better because there's a new person in a role of Director of Learning Technologies that is already showing some interest in visiting the school and doing some informal observation." Another coach shared:

> *I think the district has been not incredibly supportive. Although, with the caveat of now that there is somebody who is at least—I was going to say nominally, but he's not nominally in charge—but Kevin Crochett, the new guy. I mean, I think finally putting somebody in place, I think things are going to be a lot better. We struggled this year. I mean, we had great people, and we did a lot of great stuff. But, without having upper management support, it's like everybody that was involved was gone, so there's nobody to advocate for us on the bigger pieces. And I think that was really difficult. So, I think it will get better now.*

Principals, who were more confident in differentiating between district-level and building-level support, shared concerns about support from the district. One principal said, "I think that the TOSA [teacher on special assignment] is very supportive of our coach, but I don't see any support from district leadership. In fact, I was on the TechSmart team, and the head of K-5 literacy never came. She wasn't at the thing we had at the county school. I don't think it seems to be a priority for her." Others agreed that the TOSA is the primary support mechanism, with another leader stating, "The support comes mainly through the TOSA, who coordinates professional development and professional learning opportunities for coaches. But beyond her, if I thought about leadership as being administration at the district level I would say there's very little support." Another principal shared:

> *I don't want to be overly critical, but I am going to be somewhat critical. You know, the TechSmart TOSA position, which is a teacher on special assignment, which is generally the leadership point person, has been cut from a 1.0 to a .5 person. I have not, as a building leader, had a lot of opportunity this year to work on TechSmart. It*

used to be the first year that we would have leadership meetings where a TechSmart coach and principals would meet with other TechSmart coaches and other principals of TechSmart schools to share ideas and do that. There's been very little of that offering this year, or maybe it's been offered and I haven't seen it or taken the opportunity I guess because of time constraints, but it seems to be that that hasn't been as prevalent. And I think it's probably due to only having a .5 TOSA coordinator in that position. I do know that the TechSmart coaches meet once a month to get together and collaborate and share ideas to take back to implement in schools, but it hasn't been as prevalent for administrators in terms of that leadership role.

Data-Driven Improvement

Current, relevant and high-quality data from multiple sources are used to improve schools, instruction, professional development, and other systems.

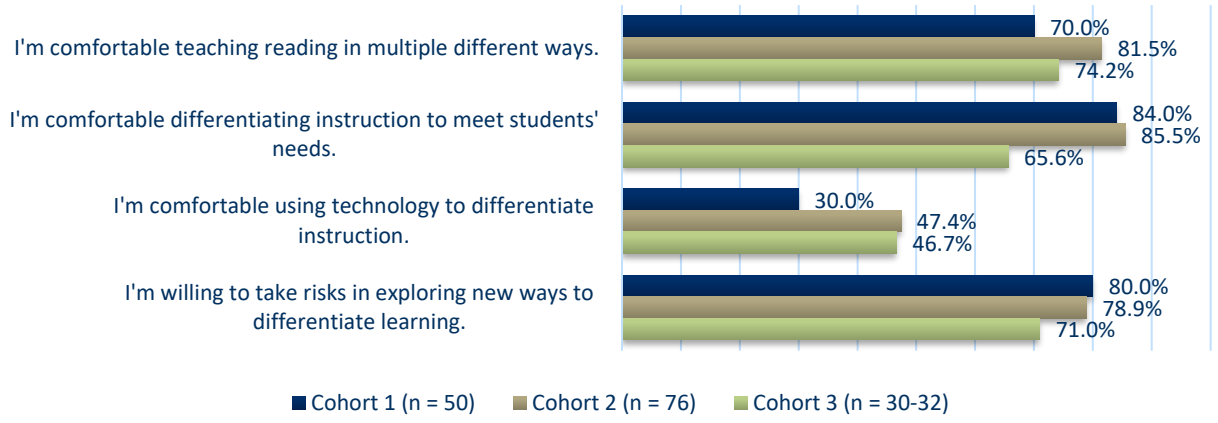
How are schools using data to improve instruction, professional development, and student performance?

Section Highlights:

Interview and survey data indicated that teachers continue to use data-driven instructional strategies. All teacher survey ratings of data-driven strategies improved from baseline to the end of SY 18-19. One coach indicated that special education teachers are beginning to use data from the technology to inform their instruction.

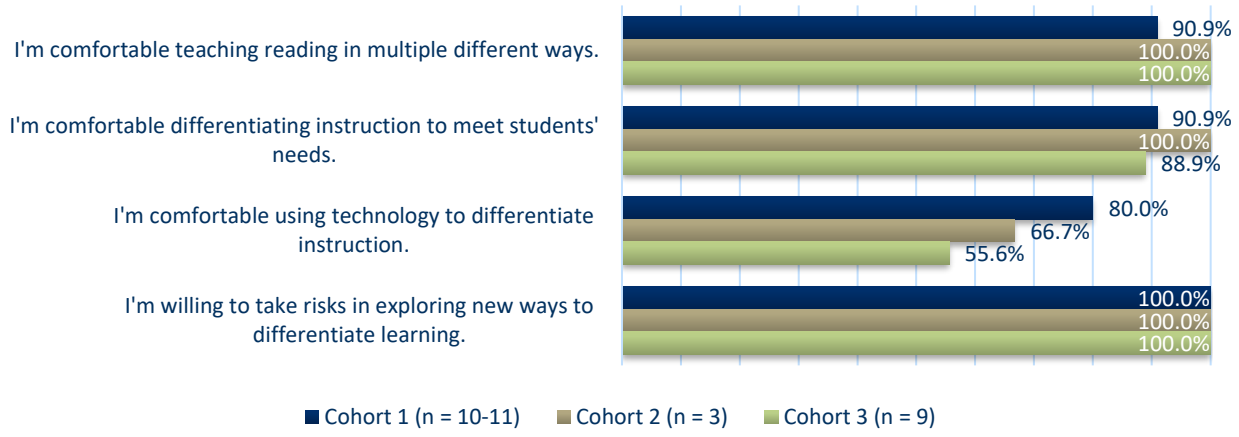
Data collected through both interviews and surveys indicate that teachers are increasing their use of data-driven instructional strategies. Figures 33 and 34 show teachers' agreement with statements about data-driven improvement, with Figure 33 showing all cohorts at baseline and Figure 34 showing all cohorts at the year-end survey for SY 18-19. At baseline, Cohort 3 teachers reported relatively similar agreement to previous cohorts. The most notable difference was that only 65.6% of teachers agreed with the statement, "I'm comfortable differentiating instruction to meet students' needs," whereas approximately 85% of previous cohorts had agreed that the same statement was "true" or "very true" of them.

Figure 33. PPS Data-Driven Improvement at Baseline
(% True of Me/Very True of Me)



All cohorts showed increases from baseline to follow-up, with 100% of teachers agreeing that some of the statements were "true" or "very true" of them. In general, all cohorts had relatively similar rates of agreement at follow-up, with the exception of the item stating, "I'm comfortable using technology to differentiate instruction." For this item, agreement seemed possibly tied to length of time participating in TechSmart, with Cohort 1 showing the highest rate of agreement and Cohort 3 showing the lowest rate of agreement.

Figure 34. PPS Data-Driven Improvement Following SY 18-19
(% True of Me/Very True of Me)



Teachers and coaches reported that Lexia is the most commonly used tool when engaging with data. One coach reported that specialist teachers are also beginning to use data in new ways, saying:

I'm such an advocate for [technology] when it's used in a thoughtful way for students, and if teachers are working collaboratively with our specialists. At Glenco, our special education teachers have also been using Lexia from time to time and looking up the data as well to look up the specific strands where students may need extra support. So they've been looking at the data to help them plan for instruction as well.

Strategic Planning

District strategic plan reflects shared commitment to improving outcomes for students.

Does the district's strategic plan reflect shared commitment to improving outcomes for students?

Section Highlights:

Although leaders reported that PPS does not have a formal strategic plan, interview responses indicated several efforts to engage in strategic thinking around technology integration efforts. Specific efforts included the addition of a new Director of Learning Technologies, a recurring meeting for leaders to discuss technology implementation efforts, and suggestions about strategies PPS could consider.

While leaders reported that PPS does not have a formal strategic plan in place, factors surrounding strategic planning were raised by teachers and leaders during interviews. For example, one principal said that the district's new Director of Learning Technologies established a group of principals who want to learn more about technology use in their schools, called Leaders Talking Tech Over Coffee. They shared, "Some of the questions that will be included in those talks are what does technology-enhanced instruction look like? How can I best model for staff? What equipment is best for our schools? It'll be interesting to see how that transpires and what that leads into for future work."

Another principal shared their hope for the strategic thinking they see taking place at the district level around technology, saying, "I feel more confident going into next year that district leadership are thinking about how to build technology into schools. They are working to make sure that things aren't isolated in tech labs. That's a very old school kind of way of thinking about how technology instruction is delivered, but they're really focusing on what teachers do within the classroom and how they can be supported in doing that to get really good results for kids."

From coaches' perspective at PPS, one coach suggested that a good strategy for the district to employ may be to have TechSmart coaches working for and/or reporting to the district, rather than individual schools. They shared, "My suggestion, and I think other coaches agree, is that it would make more sense for the TechSmart coaches to work for the district instead of working for the school. Everybody's half time doing one thing and half time doing TechSmart, and it's really easy to get overrun with other tasks and not be spending the full time that you should be on the TechSmart work. TechSmart takes lower priority because there's so much that needs doing. I think it needs to be restructured so that the principal can't prioritize other things over TechSmart time."

Funding & Budget

District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.

Have districts have identified at least one opportunity for repurposing resources to support technology integration?

Section Highlights:

During SY 18-19, PPS principals worked to set aside building-level funds to expand device availability beyond TechSmart classrooms. Additionally, the district hired a Director of Learning Technologies and implemented a new team to support technology integration and implementation within the Office of Technology and Information Services.

In the year-end report for SY 18-19, PSS reported that some principals are setting aside building-level funding to purchase additional devices for non-TechSmart classrooms, as well as to purchase Hapara to support 4th-8th grade teachers. The Dual Language Department has also used departmental funds to purchase Hapara for DLI teachers in 5th-8th grade classrooms. Perhaps the most important change, based on qualitative responses, was the addition of a Director of Learning Technologies, who was hired in March 2019. Along with this new hire, a team in the Office of Technology and Information Services was created and tasks with direct support of technology integration and implementation of instructional frameworks and strategies that further embed technology tools and resources in student learning. As described in previous sections of this report, the addition of a Director of Learning Technologies seems well-received by teachers, coaches, and principals alike.

Regarding principals' efforts to set aside funding to improve device availability for non-TechSmart classrooms, one principal described their efforts as a way to continue to support TechSmart students in continuing to have access to technology through higher grades, saying:

> *For me, what was really important is we're a K-8 school, and I believe middle school should be one-to-one technology. There should be no reason why our middle school kids don't have that technology. So I have focused on making sure that our equity funds through All Hands Raised over these past few years have purchased technology for our upper grades. So making sure that although we have two-to-one in the lower grades, making sure that there's technology in the higher grades. So that's one thing that I've been working on. So next year, middle school will be one-to-one, and I'm hoping that our four or five will be two-to-one. We'll see. We've gotta do the inventory and see where we're at with all our families. That's something that we wanted to make sure because TechSmart is for the younger grades. So then what happens when you don't have technology in the higher grades?*

Evaluation Insights at Portland Public School District

The SY 18-19 evaluation for the Portland Public School District produced the following insights:

- For the first time since the start of the TechSmart grant, the percentage of Cohort 1 students at benchmark on the DIBELS was higher than its comparison group (by 21.2%). This trend was also present for Cohort 1 students of color as the percentage at benchmark was 14.2% higher than the Comparison Cohort in SY 18-19. Cohort 2 has been outperforming it's comparison group on the DIBELS assessment since they started the grant and this difference was largest in 2018-19 (35.8%). Cohort 2 showed particular promise in the subgroup analysis, with DIBELS percentages increasing over time for students of color and SPED students. When examining TechSmart vs. Non-TechSmart students within Cohort 2, SPED students and students of color showed evidence of a decreased the achievement gap as measured by the DIBELS assessment.
- The qualitative data from the SY 18-19 evaluation indicated that there is a culture of support for technology within most participating schools, but that there has been a noticeable lack of support from the district level. The exception to the lack of support from district leadership that was described repeatedly is the addition of a Director of Learning Technologies. Interview participants expressed hope and excitement about the new position and the individual hired to fill the position, sharing that they hope the hire is an indicator of increased support.
- PPS added Seesaw during SY 18-19, with a positive response from many teachers. Teachers also seemed to use myON somewhat more often than in past years, or at least to be less frustrated with it than in past years, but still described use of Lexia more often than myON. Teachers described a need for more support and consistency regarding integration and implementation of technology in classrooms. Additionally, teachers described a need for more support from the district for repairing devices.
- The majority of teachers expressed substantial gratitude for the role of coaches in assisting with technology implementation and PD opportunities. Those teachers who did not have a positive experience with coaches during SY 18-19 seemed to indicate that the coaches had too many demands placed on them outside of technology coaching, such as additional roles within the school (e.g., half-time technology coach and half-time library staff). Teachers expressed desire for more PD opportunities, as well as for PD opportunities to be spread out more or to have additional follow-up offered. Teachers described how opportunities have diminished over the time that TechSmart has been in place at PPS, such as former opportunities to work in after-school sessions that teachers could be paid to participate in.
- One key point of positive growth since SY 17-18 is that teachers seem to be improving at adopting both EBBL and TechSmart simultaneously, perhaps due to the district's efforts to change the system for later cohorts. Many teachers described use of technology for the workshop model and emphasized the usefulness of technology for differentiating instruction and improving equitable access to technology across students from at-risk subgroups. Progress still remains to be made regarding use of technology to substitute or augment traditional instruction, rather than for modification or redefinition.

Project Summary

Centennial School District's (CSD) MHCRC TechSmart grant focuses on improving student outcomes in math and science in grades 7 to 9 through an integrated, hands-on, student-centered approach referred to as Project-Based Learning (PBL). Over four school years of implementation, which began in school year 2018-2019 (SY 18-19), CSD aims to improve achievement across all students, but especially to close achievement gaps between groups of students, including historically underserved populations. Specifically, desired project outcomes include: (1) teachers knowing how to develop effective PBL units; (2) teachers effectively implementing PBL practices and strategies; (3) use of technology-supported PBL instruction that supports student creativity, collaboration, communication, and critical thinking; and (4) improve student outcomes. All outcomes incorporate use of culturally relevant practices and meaningful, transformative technology.

CSD chose to focus on these outcomes based on an intensive, district-wide strategic planning process conducted during SY 17-18, which included examination of multiple types and sources of data. Some of these data showed that student achievement in math has declined in recent years. Other data showed noticeable achievement gaps in math and science for all historically underserved groups. Student survey data indicated low levels of student choice in learning and lack of authentic engagement in learning. Teacher survey data indicated a need for more support and resources for teachers, particularly to help differentiate instruction and implement classroom technology.

The primary vehicle for instructional changes at CSD centers on the PBL approach, with which CSD plans to use to work with students to design interdisciplinary projects that apply to real-world problems. The first phase of the project focused on Cohort 1 of teachers, which included four 7th and 8th grade math and science teachers. In the second year (SY 19-20), CSD is onboarding Cohort 2, which consists of the remaining 7th and 8th grade math and science teachers. In the third year (SY 20-21), CSD will onboard the final cohort, Cohort 3, which will include all 9th grade math and science teachers. Throughout the first three years of implementation, a full-time STEM coach will work with each cohort, supporting those teachers that have been onboarded and building capacity in those teachers who have not yet been onboarded. The final year of the project will focus on sustaining implementation, with no new teachers and half-time STEM coach support.

Given that SY 18-19 was CSD's first year of implementation, this report presents data from Cohort 1. No student achievement data are presented, but these data will be incorporated in future reports as data become available and applicable. During each year, teacher cohorts create and implement two integrated math/science PBL units and self-reflect using rubrics to evaluate effectiveness of the projects. Following revision, PBL units will be archived and curated for other participating teachers to develop a digital community of practice. Teachers receive three days of training about PBL, as well as on-site support from a full-time STEM coach throughout the year.

Methods

A general description of the methods included in the TechSmart evaluation are included in the introduction to the full report. Data collection efforts for the SY 18-19 evaluation in CSD are summarized below. Student achievement data (e.g., ELPA, credit attainment) will be included in next year's report but

are excluded from the current report, as student achievement data are not yet available over a period of time long enough to warrant conclusions.

Teacher Survey

PRE designed a survey that was administered online to teachers in both September of 2018 and April/May of 2019. Four teachers from Cohort 1 completed the survey at baseline. Additionally, four teachers from Cohort 1 completed the spring follow-up survey.

Teacher Interviews

PRE conducted phone interviews with three teachers involved in the TechSmart grant in Centennial School District. All teachers were part of Cohort 1.

District Leader Interviews

PRE conducted three interviews with leaders from CSD, including the district's Director of Curriculum and Student Learning, the middle school's Assistant Principal, and the full-time STEM coach.

Student Surveys

A student survey was administered in April/May 2019. A total of 170 students completed the survey. All participating students came from 8th grade.

Leadership Rubric

The leadership rubric was completed by the middle school Assistant Principal and the STEM coach.

Leadership Observations

An online leadership observation form was completed by the STEM coach for four teachers. The form asked leaders to rate teachers' use of technology and provide examples of how each teacher used technology to support instruction for at-risk subgroups.

Findings

The evaluation findings from the SY 18-19 evaluation at Centennial School District are presented below and organized by the seven factors identified as essential for schools to effectively transform into technology-rich teaching and learning environments.

Teaching Effectiveness

Districts support regular, inclusive and shared professional development among teachers.

Within CSD, TechSmart-related professional development (PD) activities begin with a three-day training about PBL for each cohort. The training is designed as an immersive summer seminar and is facilitated by the Buck Institute for Education (BIE), a partner for the project. Topics include foundational understanding of PBL, culturally relevant practices, using rubrics to create high-quality PBL opportunities, family engagement, designing a PBL unit, and ELL scaffolds for language development. Additional group PD opportunities include a half-day technology management session that focuses on device management, Hapara, Google Classroom, and student digital citizenship.

The other primary component of TechSmart PD is the full-time STEM coach, dedicated to integrating pedagogy and technology tools. One of the issues determined during project planning was that teachers have varying levels of skill and comfort with technology, despite shared enthusiasm about implementation. The full-time STEM coach allows for differentiation among teachers, providing different levels and types of support to each teacher based on their needs, experience, interests, and skills. In addition to providing support to participating cohorts that have been onboarded, the STEM coach is tasked with building capacity for those cohorts that have not yet been onboarded. All cohorts have access to technology for experimentation and receive support to take initial steps toward technology integration, logistics and device management, and use of Google tools and apps. Speaking about the coach, one teacher shared:

> *Yeah, she'll come and help you teach the kids how to use [technology] or teach you how to use it with the kids and how it could be useful as well. And she kind of does the legwork of, like, finding programs that are helpful, which is something that it seems like we never have time to do. So that's been really nice. And then we've added some other technology as well, like virtual reality ….There is a whole bunch of stuff that she has been able to use her time to get for us and then also to teach us how to use with kids to get ideas for instruction that we probably wouldn't be able to do otherwise.*

Generally speaking, teachers and leaders both expressed excitement and satisfaction with the PD model and the PD being implemented and received. Cohort 1 teachers who participated in interviews reported extremely positive experiences with the STEM coach, and also consistently asked for increased PD time. One teacher commented, “I think that our coach does a really good job of finding stuff that is going to be useful but then a lot of it she ends up having to push it out via e-mail because there's not really any other

time for her to do it. So I mean, I think we could utilize her more for professional development as far as the grant goes."

Similarly, one issue that CSD may need to continue to work through or improve communication around is that of the amount and replacement of PD. One leader shared that they continue to get questions about the balance of PD across all the different topic and content areas for which teachers receive PD, saying:

> *One question that I get occasionally from teachers is, "Oh, well, we're going to need technology PD, and that's going to probably have to replace –." One comment that I had to field was, "We should stop doing equity PD, so we can focus on technology." No. We're not going to get rid of equity PD. And I also get that people do need professional development in technology. So, one of the things that we've been doing is trying to build capacity in our administrators. We've been doing some professional development for our admin, and trying to work with our administrators so that, for example, when they're sending out their weekly updates it's not in a Word doc. They're doing that in Google Doc and trying to model some of that. Some of the different schools, sometimes they'll do professional development kind of like choice style for teachers. So, they'll have breakout sessions that are about how to do this specific thing technology-wise. We're trying to be intentional about integrating tech into our PD and also offering professional development that would be appropriate for teachers and administrators across the district.*

Teachers also described opportunities to participate in a committee related to the project, though meetings seemed to conflict sometimes with other committees. One teacher said, "We have committee meetings every Tuesday, and so [the coach] is available for a committee meeting, but I'm on a different committee. I do some individual stuff and stop in her office now and then. But I am not able to go to that. It's every other week." Teachers also mentioned additional planning time related to the project. One teacher said, "I worked with [our coach] a couple of times and then I've also – I've worked with her actually quite a bit in terms of equipment usage and designing certain activities to meet the needs of things. She's been a great resource. Then we've also been given some additional planning time. There was a couple of professional development days this year, and I was permitted to use those to do some planning."

Table 1 and Table 2 summarize the amount of group and individual PD that Cohort 1 teachers received by the end of the school year. The year-end survey data show that all of the teachers in Cohort 1 reported receiving two or three hours of group PD, but these reports do not appear to include the summer seminar.

Table 1. Centennial School District Hours of Group PD

Hours of Group PD	Cohort 1 (n = 4) End of Year Survey
0 hours	0.0%
1-8 hours	100.0%
9-16 hours	0.0%
17-32 hours	0.0%
33+ hours	0.0%

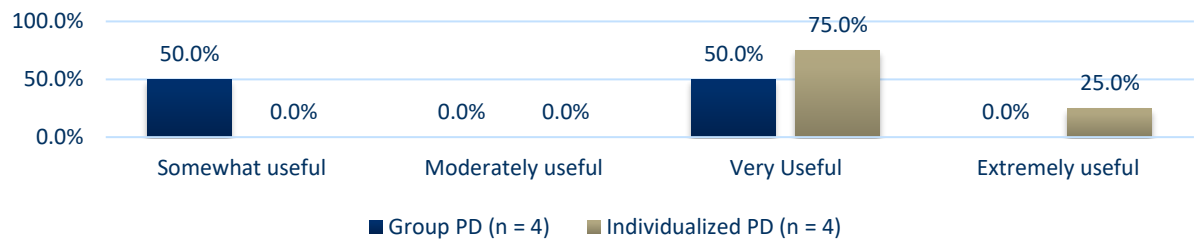
Table 2 shows that all Cohort 1 teachers received between one and eight hours of individual PD during SY 18-19. Specifically, teachers responded that they received two to five hours of individual PD during the year.

Table 2. Centennial School District Hours of Individualized PD

Hours of Individualized PD	Cohort 1 (n = 4) End of Year Survey
0 hours	0.0%
1-8 hours	100.0%
9-16 hours	0.0%
17-32 hours	0.0%
33+ hours	0.0%

Teachers rated the usefulness of the group and individual PD at CSD. Results are illustrated in Figure 1. A total of 50% of Cohort 1 teachers found group PD to be "somewhat" useful, while the other 50% found group PD "very" useful. Individual PD was rated higher in usefulness, with 75% of Cohort 1 teachers rating individual PD as "very" useful and 25% rating it as "extremely" useful.

Figure 1. Centennial End of Year Teacher Ratings of PD Usefulness



How is professional development impacting teacher instruction?

Section Highlights:

This evaluation question includes the following outcomes: 1) PD has helped teachers increase the use of technology for evidence-based instructional practices, 2) PD has helped teachers use technology to analyze and use data about student learning, and 3) PD has helped teachers use technology to differentiate instruction. During SY 18-19, Cohort 1 teachers increased their use of technology for evidence-based instruction and to differentiate instruction. Reported use of technology to analyze data about student learning dropped slightly, from all four Cohort 1 teachers to only three Cohort 1 teachers. Teachers described positive impacts of the PD model. Overall self-reported teacher skill level increased from the beginning to end of SY 18-19.

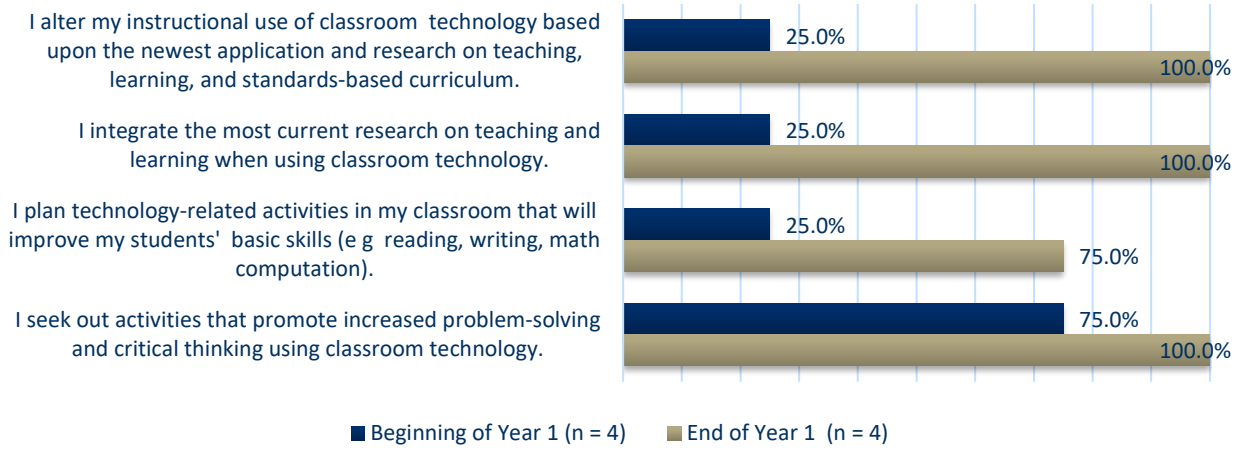
The teacher survey asked how effective the PD model has been in impacting teacher instruction. The three Cohort 1 teachers who responded to this question shared positive opinions about PD and the overall project (see Table 3).

Table 3. Effectiveness of the PD Model at Centennial - Cohort 1

"My instruction has changed greatly due to the fact that I now have access to a class set of chrome books for my students to use."
"It has helped provide a LOT of support and supplies for integrating technology into the classroom."
"Most of the PD has been based in PBL and not technology. Most of the technology information has come in the form of emails and offers of one on one help."

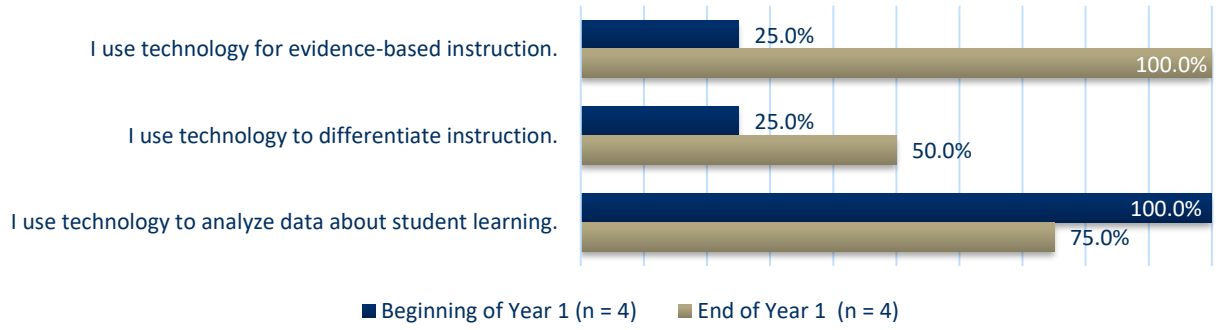
Teacher surveys at the beginning and end of SY 18-19 asked teachers to rate the degree to which several statements about instructional strategies were true of them. Responses are displayed in Figure 2. By the end of SY 18-19, teacher responses improved for all four items, indicating that teachers integrated each of the following strategies more at the end of SY 18-19 than at the beginning: altered instructional use of classroom technology; integrated current research; planned technology-related activities; and sought out activities that promote problem-solving and critical thinking using technology.

Figure 2. Centennial Instructional Strategies
(% True of Me/Very True of Me)



The survey also asked teachers to describe the extent to which the PD increased their use of technology for evidence-based instruction, differentiating instruction, and analyzing and using data about student learning. Results from the beginning and end of year surveys given to Cohort 1 teachers, which are displayed in Figure 3, showed that use of technology for evidence-based instruction and use of technology to differentiate instruction both increased in frequency from the beginning to end of SY 18-19. Use of technology to analyze data about student learning decreased, with only three of four Cohort 1 teachers reporting they use technology to analyze data about student learning "a moderate amount" or "a great deal" at the end of the year.

Figure 3. Centennial Instructional Technology Use
(% A Moderate Amount/A Great Deal)



Teachers reported their technology skill level on the beginning-of-year and end-of-year surveys by rating themselves at one of the following five levels:

Level 1: I get someone else to do technology-based tasks for me.

Level 2: I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job.

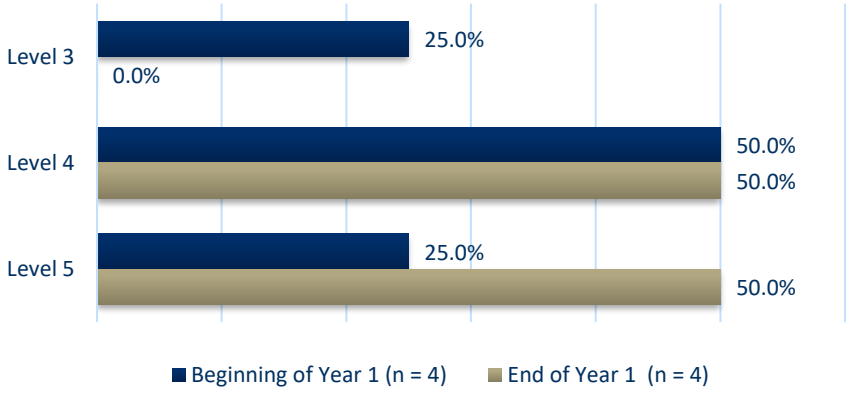
Level 3: I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose.

Level 4: I use a variety of technology tools and I use them efficiently for all aspects of my job.

Level 5: I use technology efficiently, effectively, and in creative ways to accomplish my job.

As illustrated in Figure 4, at the beginning of SY 18-19, one Cohort 1 teacher reported their skill level as a Level 3, while two teachers reported Level 4 and one teacher reported Level 5. By the end of the year, two teachers reported their skill level as Level 4, with the other two teachers reporting Level 5. In other words, all Cohort 1 teachers reported their skill levels at or above Level 4 by the end of the year, representing an overall increase in self-reported skill from the beginning of the year.

Figure 4. Centennial Teachers' Technology Skill Level - Cohort 1



What new instructional strategies are teachers reporting?

Section Highlights:

Teachers from Cohort 1 described many changes to their instructional strategies. During the year-end survey, teachers most frequently reported using instruction for differentiating instruction and to create hands-on activities. During interviews, teachers most frequently described the PBL approach and how related strategies have changed their instruction. Leadership confirmed that they are seeing increases in technology integration and effectiveness in classrooms, but did not notice many targeted approaches for at-risk subgroups. Both leaders and teachers rated Cohort 1 teachers' use of technology for planning and preparation and for engaging students in learning very highly.

Cohort 1 teachers were asked to provide examples of instructional strategies that they believe have been effective in their classroom instruction and rate the strategies on a scale of one to five, with five being the most effective. Table 4 shows the ways in which teachers described use of technology, along with average effectiveness ratings. Cohort 1 teachers most commonly reported using technology to differentiate instruction and to create hands-on activities.

Table 4. How New Technology is Being Used for Instruction – Cohort 1

Instructional Supports	Effectiveness Rating End of Year
Digital task cards	**5.00** (n = 1)
Digital microscopes	**3.00** (n = 1)
Remote sensors	**4.00** (n = 1)
Technology-related hands-on activities	**4.50** (n = 2)
Differentiating instruction	**3.50** (n = 2)
Enhancing collaboration	**3.00** (n = 1)
Increasing engagement	**5.00** (n = 1)
Multiple modes of accessing information	**4.00** (n = 1)
Research and presentation	**5.00** (n = 1)
Modeling abstract concepts	**4.00** (n = 1)

Teachers were asked to self-assess their use of technology to support instruction using a rubric on the year-end survey. Leaders were also asked to complete the same rubric "thinking about their TechSmart teachers as a whole" following their leadership interview in the spring. Both the STEM coach and the Assistant Principal completed the rubric.

Table 5 presents results from leader observations, leader rubric ratings, and teacher self-ratings of teachers' use of technology to support instruction. Teacher survey data (i.e., first column of data) reflect self-ratings of technology use in teachers' own classrooms. Leadership rubric survey data (i.e., second column of data) reflect two CSD leaders who provided ratings thinking about "TechSmart teachers as a whole." Finally, leadership observation data (i.e., third column of data) reflect four individual observations conducted by CSD leaders within individual teachers' classrooms. Cohort 1 teachers rated themselves highest in use of technology for: planning and preparation; engaging students in learning; using assessment in instruction; and demonstrating flexibility and responsiveness. Leaders rated Cohort 1 teachers highest in use of technology for planning and preparation, engaging students in learning, organizing physical space, using assessment in instruction, and demonstrating flexibility and responsiveness. For most categories, leaders rated teachers higher than teachers' own self-ratings.

Table 5. Technology Used for Supporting Instructional Practices
(1 = Not At All, 2 = Very Little, 3 = Somewhat, 4 = To a Great Extent)

	Teacher Survey: Cohort 1 (n = 4)	Leadership Rubric Survey (n = 2)	Leadership Observations (n = 4)
Planning and Preparation	3.75	4.00	4.00
Managing Classroom Procedures	2.50	3.50	3.75
Organizing Physical Space	2.50	3.00	4.00
Communicating with Students	3.50	3.50	3.25
Using Questioning and Discussion Techniques	3.00	3.50	3.50
Engaging Students in Learning	3.75	4.00	3.75
Using Assessment in Instruction	3.75	3.50	4.00
Demonstrating Flexibility and Responsiveness	3.75	3.50	4.00

In the rubric, leaders provided specific examples of how teachers use technology to support new instructional practices. One leader said, "Use of assessment tools (Kahoots, Quizlet, Google Forms). Use of Google Classroom to make learning accessible to students who have been absent, or need an organized area to locate their work. Integrating with PBL work." Another leader explained,

> *I'm seeing an increased use of technology during assessment. It is used in many interesting and authentic ways during PBL units (example: math students created garden bed designs on their Chromebooks and submitted their proposals online).*

Leadership also commented on how teachers have used technology to support instruction for at-risk subgroups (i.e., students of color, ELL, SPED, and low SES). One leader said, "Access to tech for assistive technology (help with accessing text levels, predictive writing, access to websites in various languages and Google Translate." Another leader had more trouble with this topic. Based on their response, it appears that there may not be a lot of use of technology that is specific to at-risk subgroups, perhaps because CSD has such high proportions of students from at-risk subgroups. The leader said:

> *It's difficult to answer this, because I'm not sure I'm seeing targeted approaches, but the technology use is allowing for increased differentiation and allows for content and student work to be more individualized. For example, if students need different levels of reading, they can access different resources (some instructors will build website lists for students to start at during research to assure that students will access writing that will work for their readers).*

In our interviews, teachers shared the ways they are integrating new instructional strategies into their classroom using technology. While some teachers reported using technology mainly as a means of substitution for more traditional instructional strategies, other teachers had used technology to completely change the way their classroom looks and functions. For example, one Cohort 1 teacher described their blended classroom, explaining that instead of lecturing in class, the students watch recorded lessons on

Schoology on their own time, and use class time to collaborate with each other and work one-on-one or in groups with their teacher. Another Cohort 1 teacher said the following when asked how their classroom instruction looks different now compared to before the grant:

> *It's different in the sense that the students have access to different tools, and there's different ways that the students can be engaged with the tech, so the way I interact with them is a little different now, just because of what they're using, and it sort of frees me up to circulate around and check in with them sometimes. Or keep in touch with them on a digital platform.*

Teachers were asked to describe new instructional strategies, both in interviews and in the year-end survey. During the survey, one teacher said, "Students in my classroom have increased opportunities to use programs like DESMOS. They enjoy the activities, show an increase in engagement, and I am able to monitor their understanding and provide immediate feedback." Another teacher shared, "Using remote sensors to gather data. Then entering data into a spreadsheet and making a graph." Another example provided by teachers listed, "Computer-based math learning game."

During interviews, teachers described a wide variety of ways that technology impacts their instructional strategies. The most substantial and consistent shift described was related to the PBL strategies that have been emphasized at CSD since the beginning of TechSmart. All three teachers who were interviewed described ways that PBL has been incorporated into their instruction. One teacher said, "I've been trying to shift a lot of my lessons to have a project-based approach, where they're trying to solve something that's more related to a real-life problem. And so at first it kind of seemed like they were not into it, but then once we got into the big, the end project, it was really good. So I think that that has a lot of promise as far as motivating kids as long as—I think you have to be really careful and make sure that all the content's still in there."

Another teacher described how the PBL approach is bringing different subject areas together in new ways, with teachers partnering to make it possible. They said, "Because the PBL we're doing – like the first one we did was a math and science unit, so I had the kids in my classroom and then they're in totally different classrooms all mixed up. They're using Google Classroom to try to, like, crash back and forth between science and math. And then the one we use later will be for all four of the subject areas. We're doing something that pulls everything together."

Another major shift described by teachers during interviews was related to the activities that are available, and the accessibility of those activities. Technology broadened the opportunities available for teachers to provide to their students. One teacher said:

> *The kids just have a lot more opportunities for research and things like that, so I have incorporated more of that. Whereas in the past, we haven't really had the resources. Most of the information was coming from me, you know, and the technology is allowing me to have them watch a short video, have them read the short clip, or look at some little graphs on the computer and kind of come to some conclusions on their*

own without me just giving them all the information. In the past, I would have had to, like, photocopy a million different pages to give them. And when you have the digital option, then it makes it a lot more accessible.

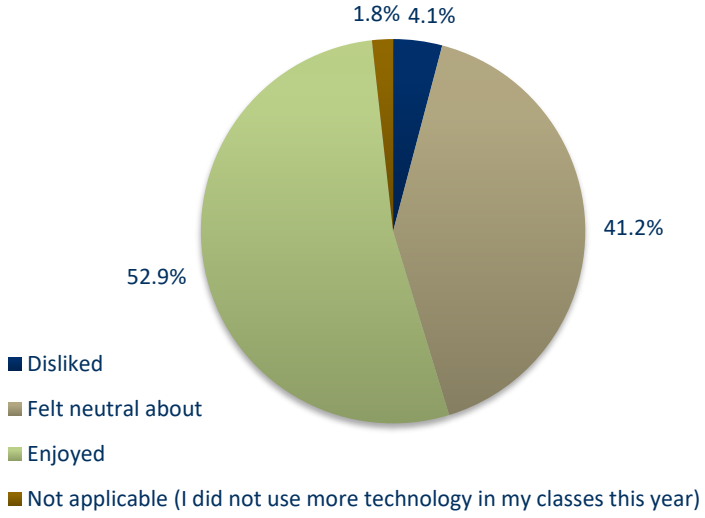
How are the new instructional strategies impacting student engagement?

Section Highlights:

Results from the SY 18-19 evaluation showed that students generally enjoyed or felt neutral about use of technology in classrooms, and engagement seemed to increase overall. During the qualitative portion of the student survey, many students shared comments that indicated that technology helps them learn, enjoy class, focus, organize and research information, and work more efficiently and effectively. Some students expressed more negative opinions, such as preference for previous modes of instruction or distraction.

On the student survey, students rated the effect of technology on their classroom engagement by completing the statement, "I generally _____ using more technology in my classes this school year." Figure 5 shows student responses. The majority of students enjoyed using technology more (52.9%) or felt neutral about the increased use (41.2%).

Figure 5. Centennial Students' Feelings About Increased Use of Technology in Classrooms (n = 170)



Similarly, students rated their enjoyment of technology in class more broadly by completing the statement, "I generally _____ learning in class when technology is incorporated." Figure 6 shows student responses. The majority of students reported feeling neutral about learning in class when technology is incorporated (51.8%), with another large portion (45.9%) reporting enjoyment.

Figure 6. Centennial Students' Feelings About Learning when Technology is Incorporated (n = 170)

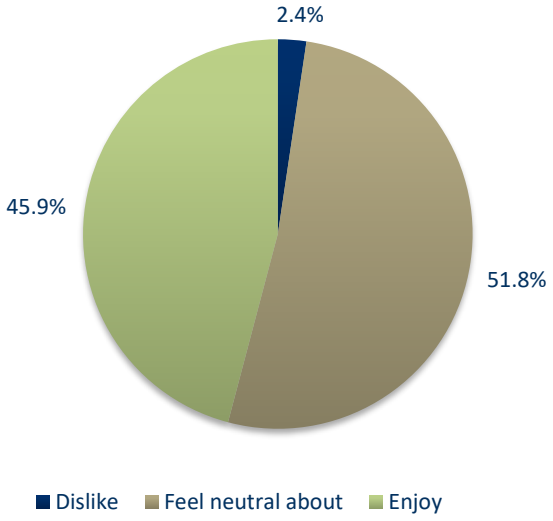


Figure 7 displays students' agreement with several statements about their feelings toward learning when technology is used. The majority of students expressed neutral or positive feelings related to each statement. Of all items, the item to which the largest portion of students had a positive response was, "I know that using technology gives me more opportunities to learn new things." Of all items, the item to which the largest portion of student expressed a negative response was, "I would work harder if my teacher used technology more often," indicating use of technology may not predict student-perceived effort levels.

Figure 7. Centennial Students' Feelings About Learning and Technology (n = 170)
(% A Moderate Amount/A Great Deal)

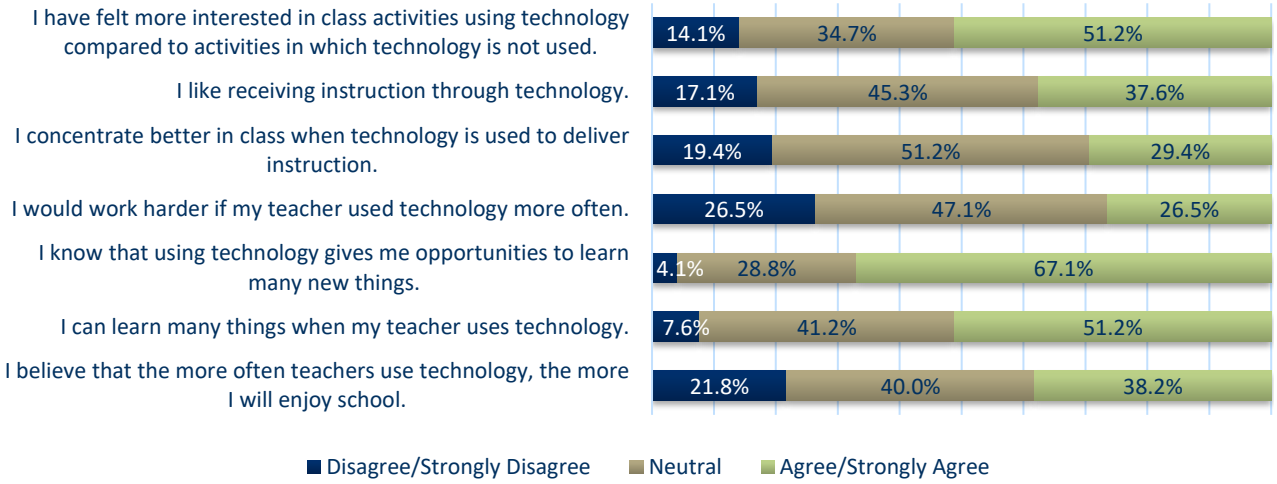
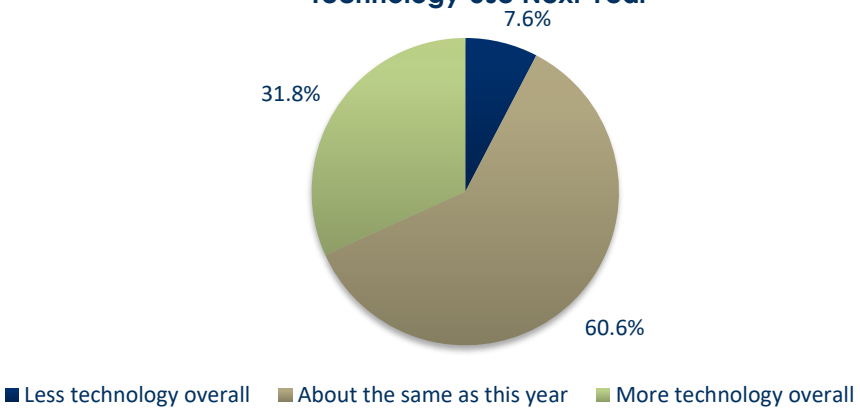


Figure 8 displays students' responses when asked to complete the statement, "After using more technology in my classes lately, I hope my teachers next year use…" The majority of students (60.6%) responded that they would like to see about the same technology use next year, indicating the level of technology use was satisfactory for most students. A total of 31.8% of students desired even more technology use, while only 7.6% desired less technology in the next year.

Figure 8. Centennial Students' Desire for Technology Use Next Year



Students described whether their opinions had changed with regard to teachers incorporating more technology into their lessons. While many students indicated their opinions had not changed, opinions from those who shared were primarily positive. Students described how technology is helpful for learning and retention, fun and enjoyable to use, helpful for focusing, helpful for research and organization, and more convenient and efficient. Some students explained that they enjoy use of technology and wish for even more use in the future. Table 6 provides examples of each theme from positive student opinions.

Table 6. Centennial Students' Positive Opinions of Technology Integration

Theme	Sample Quotes
Helpful for learning and retention	• *"There was more tech this year and I like it. My grades went from mostly B's to mostly A's."* • *"I guess technology just makes whatever the lesson was about or is about more bold to remember."* • *"I learned more on how to use the computers."* • *"We can pay attention to the teacher and the power point at the same time and it keeps our focus and makes us retain more information."* • *"I like it because if you don't get something you can replay it or rewatch it and it gives multiple examples."*
Fun/enjoyable	• *"I like it more because you are able to work on technology which is not only fun but overall easier."* • *"I enjoy doing work better when technology is involved."* • *"I like them better because they allow us to do what we want (within reason) on the chrome books when we finish our work."*

Theme	Sample Quotes
Helpful for focusing	• *"I feel like technology in classes are a good thing. They can help us focus, especially when our handwriting is garbage, and in some cases it can be better than pen and paper."* • *"I feel more engaged and I feel like I pay more attention in class then before."* • *"I have more focus on my work."* • *"I feel like it makes kids pay more attention because we're already so used to looking at screens all day."*
Helpful for research and organization	• *"It's more helpful because we can search things up."* • *"It makes it easier to catch up on missing assignments and its more organized."* • *"I really like it a lot. It is much more organized, for example I am not losing as much assignments in my binder and I keep everything organized to my liking in google docs or a file of my choice. I hope that we can have our own personal Chromebooks as a substitute for a binder."* • *"It has helped me get the information I need at my fingertips. If I need to search up how to spell something I can."*
More convenient and efficient	• *"I think that technology helps because they can show us information faster."* • *"I think the technology is smarter to use, especially to save time on grading and paper worksheets."* • *"It's better because paper takes forever to grade and computers are easy"* • *"I can't really see on the board that well, so I think technology helps me get more work done."*
Positive opinion, but desire for even more technology use	• *"We should play more learning games."* • *"I don't know we only use the computers like twice this year so I can't answer this question."* • *"We didn't use more technology"*

Other students expressed negative opinions toward technology integration. Themes from negative student responses included preference for previous modes of instruction, inhibition of learning, distraction or boredom during technology use, difficulty using technology, and dissatisfaction with teachers' roles during technology use. Table 7 provides examples from each of these themes.

Table 7. Centennial Students' Negative Opinions of Technology Integration

Theme	Sample Quotes
Prefer previous mode of instruction	• *"That's all they use and it is not good for us."* • *"I feel like we need more hands-on learning without technology."* • *"I dislike it because I prefer teachers talking to me."* • *"My thoughts haven't changed and honestly using technology is more confusing and I don't really like it that much."* • *"I still enjoy doing real life experiments rather than simulations on some website."* • *"I'm glad it's easier for the teachers but I'd rather not stare at a computer screen all day."*

Theme	Sample Quotes
Inhibits learning	• *"I feel like technology makes a lot of things complicated; when we use technology, our teachers don't really explain the instructions. They expect us to know already."* • *"When learning new topics it is easier to learn when it comes from a teacher rather a computer."*
Distracting or not engaging	• *"I don't really like it. It distracts me."* • *"They distract more students because they play on them a lot."* • *"Sometimes when they make us just watch videos it gets boring."*
Dislike teachers' roles with use of technology	• *"I hate the teachers more because they take too long explaining how to use the computers every time."* • *"When we work on the computers the teachers don't do anything but watch, which doesn't help me learn."* • *"Teachers teach less and they're making the computer do all the work."* • *"My opinion is before we incorporate new technology into classrooms, the teachers need to know how to use the technology. In my classes now, we have touchscreen Chromebooks and whiteboards. But not every one of the teachers have figured out how to use them."* • *"I think teachers became more lazy."*

In interviews, leaders and teachers described how students have been generally more engaged during the increases in use of technology and PBL strategies. One leader said, "I think it's fair to say that teachers that have been involved in the grant in our cohort are doing some curriculum things that they're excited about and they're integrating technology in ways that the kids are really enjoying and are directly related to, you know, the content becoming more interesting."

Teachers provided more specific insight into the value of the new approach extending from TechSmart implementation. Teachers consistently noticed more engagement, aligned with increases in technology use and PBL strategies. One teacher noted a particularly substantial change in student engagement, saying:

Once we got into the final project for the project-based learning and they were making the videos, they would have worked on that for a month if I would have let them. They were super engaged with that and I've never seen that with any other activity that we've done in class before. So it was kind of weird because they'd just come in and get started working before class started and I didn't really have, you know, I was just there to help them if they needed something. But they were kind of self-motivated doing it. So that was really cool.

As far as daily activities, I think some kids who don't have access at home can get distracted. You know, they have the games, but they don't necessarily have it at home to do. So sometimes they're super motivated to use [the technology] but they may not always use it for what you want them to do.

Are the new instructional strategies showing promise for improving academic outcomes?

Section Highlights:

While student achievement data were not yet available, both student survey data and leader/teacher interviews indicated promise for the value of new instructional strategies toward improving academic outcomes. Students indicated that technology had a largely neutral or positive impact on their learning and focus, and teachers and leaders consistently shared positive views of the promise the new strategies and technology implementation show for improving student outcomes.

While student achievement data are not yet available for a long enough period of time to warrant inclusion in the current report, subjective data regarding the impact of technology on learning gathered from the student survey, as well as from leader and teacher interviews, are presented below. Figure 9 shows student reports of the effects of technology on learning. The majority of students reported that technology had a neutral or positive impact on their learning. Approximately 40% of students reported that technology helped them learn more, while over half of student (54.1%) reported that they learned the same amount whether they had technology or not. Only 5.3% of students reported that technology slowed their learning.

Figure 9. Centennial School District Effects of Technology on Learning (n = 170)

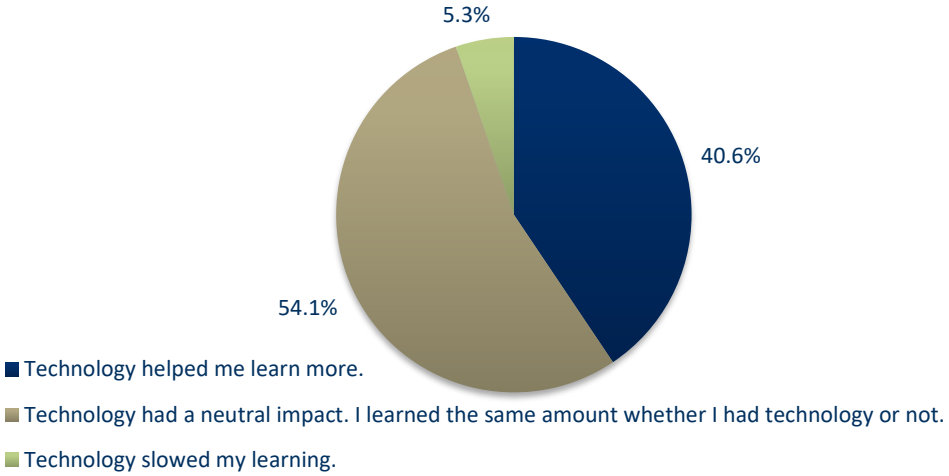
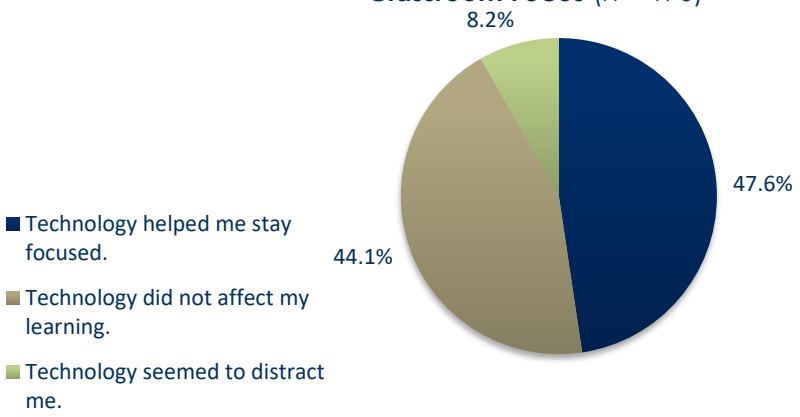


Figure 10 displays student responses regarding their experience with technology in the classroom and ability to focus. Nearly half of students (47.6%) responded that technology helped them stay focused, while another 44.1% of students responded that technology did not affect their learning. Only 8.2% of students indicated technology seemed to distract them.

Figure 10. Centennial School District Effects of Technology on Classroom Focus (n = 170)



During interviews, leaders and teachers commented on their perspectives and opinions regarding whether changes in technology and learning strategies are improving student outcomes. The participating interviewees generally indicated it was too early to tell, but all agreed that they see promise for improving outcomes. One leader expressed their hope for the future of the program, sharing:

> *If we could ensure that, again, it was well supported and resourced, I would want to see project-based learning happening throughout the school. I think that we can really shift to having students taking ownership of their learning and having some choice and some just being able to be creative and to collaborate and to figure out solutions to problems and to refine the ways that they're communicating with each other and with community members and teachers. Those are the skills that we need to have as adults. And so, if you think about the inverse of that, which is like the traditional way of doing things where students are passive, and the teacher is doing all of the kind of like the heavy lifting in the learning environment, students are disempowered. They don't feel like they have choice. That learning is something that is done to them instead of something that they're engaged in that it doesn't connect to their lives. So, I think there's so much promise in shifting the culture of teaching and learning in all of those different ways through this project.*

Do instructional practices show promise for improving student academic outcomes with at-risk student subgroups (i.e., students of color, low SES, LEP, special education (or those with an IEP), and those not on track to meet academic standards)?

Section Highlights:

Despite lack of student achievement data availability, teachers and leaders described the promise that new instructional practices and use of technology are showing for students from at-risk subgroups. During both interviews and the year-end survey, participants emphasized the benefits of technology for

increasing engagement, participation, access, and achievement within both at-risk subgroups and the full student population.

The potential of new instructional practices to improve student academic outcomes is considered in the current report based on teacher survey data and interviews with teachers and leaders. Student achievement data will be available for future reports. Across CSD, leaders commented on the prevalence of at-risk student subgroups in the student population and indicated they felt it was too early to tell whether the achievement gap is closing based on the new strategies and tools available. One leader shared:

Our school has very high percentages of EL students, students of color, so it's a little bit hard to generalize. When I've been at a school where maybe there were a small handful of students of color, it was a little bit more obvious how they were reacting, and here I think it's a little harder to be an observer and see a clear pattern around that, just because you might be talking about like 75 percent of the classes sometimes. But I would suspect that some of the students that have been struggling to engage – like kids get to a place where they think, "I'm not good at school," and then they just kind of stop trying and then sometimes other behaviors come out. I think when the curriculum can get them back into it and get them excited, and not feel to intimidating and get some of those students that have been disengaged to try again. So I think as we get students engaged there is a really good chance we can close the achievement gap, and if they're having all of these different ways of showing what they've learned and having more tools they might get excited about using I think it can really help with that. But I think we are kind of early and it probably is showing up in data, but just in terms of changing the culture of the classroom, I think there's some promising stuff happening.

When asked whether the use of technology shows promise for closing the achievement gap, one leader described how technology is viewed as a tool to support implementation of new instructional practices. They commented on the district's focus on instructional strategies, saying, "Well, I think to be honest with you, I don't know if I can speak to that question yet. Because one of the things that we've been really intentional about – I mean, having the technology is great, and it's being utilized. But, what we really focused on is instructional design. I think the technology is kind of like the icing on that cake. We've actually been trying not to lead so much with the tech and the apps and the programs. Because those things, I think, distract from the heart of the matter, which is that the real shift that we need to see happening is in the instructional design and the way units are designed, the way lessons are designed. And technology is a tool to support that. So, I still think that there's a lot of promise in all of that, but I don't think that we're at a point where we can say that technology is closing the gap for those groups."

Another leader described how at-risk student subgroups fit into the overall strategy and planning of the district. They said, "One of the big plans is that we're really focusing on equity and access, and I think technology, when it's used really well, it can definitely provide avenues for students. Where they've been waiting on one teacher to help 30 students, they might now be able to access resources more quickly at their level and at their need."

During the year-end survey and interviews, teachers from Cohort 1 commented on the strategies they have used with at-risk subgroups. Table 8 lists teachers' comments from the year-end survey.

Table 8. Teachers' Use of Technology-Supported Instruction with At-Risk Subgroups - Cohort 1

"All students have shown an increase in engagement."
"Provided basic instruction in usage of Chromebooks. Many of the students in those subgroups do not have access at home and have limited skills."
"I provide students with interactive task like digital task cards or learning games that are focused on the area that the student needs help in."

In interviews, teachers described the advantages they have seen so far to using technology with students from at-risk subgroups. One teacher said, "I think for English language learners and kids who struggle, you know, just kind of with vocabulary and things like that, you kind of have an instant dictionary right there and if you don't know what a word is, they just quickly Google something and they're pretty good at figuring out what things are. So I think it helps them feel like they have more control. They don't have to constantly ask someone to explain something. And I see them all the time just like Googling things without asking me. So I think that that's pretty important."

Other teachers described how the technology is benefitting all students—not only those students who may belong to at-risk subgroups. One teacher said:

> *They're getting the practice that they need to learn the material, whereas in the past if they had homework some kids wouldn't do homework. And maybe still they're not doing their homework, but they get more in-class practice because it's a little bit faster paced with the computer. They'll do two problems and, with immediate feedback on some of the activities that we do, they'll just know, "Oh, I didn't get it. What should I have done?" But that's for all students not just a subgroup.*

Digital Age Learning Culture

Districts embrace a cultural shift and view technology as positive.

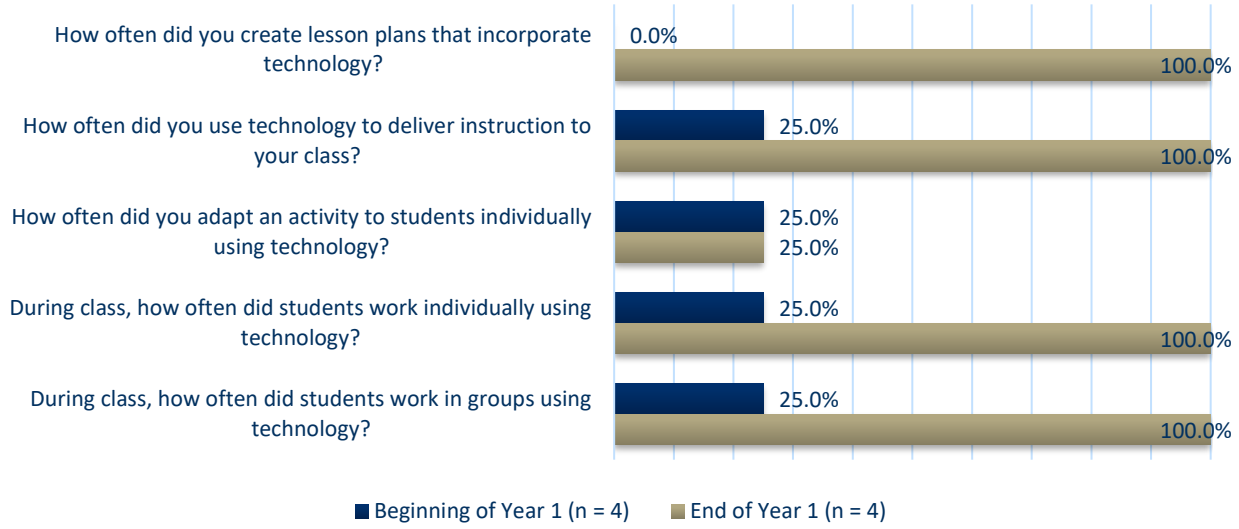
Has the use of technology to support instructional practices increased?

Section Highlights:

Teacher survey results showed a substantial increase in frequency of technology integration in classrooms across four of five measured areas. Opportunity for continued growth remains in how often teachers adapt activities to students individually using technology. The year-end status report provided additional examples of increased use of technology across the district, with new tools and resources available from the district's STEM coach and new PD for administrators that is specific to technology.

Figure 11 illustrates the frequency with which Cohort 1 teachers integrated technology in five different ways, comparing the beginning of SY 18-19 to the end. By the end of SY 18-19, all four teachers (100.0%) reported "a moderate amount" or "a great deal" of each of the following: creation of lesson plans incorporating technology, use of technology to deliver instruction, individual student work with technology, and group work with technology. On the other hand, only one of four teachers (25.0%) reported adapting an activity to students individually using technology, both at the beginning and end of SY 18-19.

Figure 11. Centennial Frequency of Technology Integration
(% A Moderate Amount/A Great Deal)



The year-end status report also indicated several ways in which technology use to support instructional practices has increased. Increased use of technology to support instruction within the district included development of an online tool to streamline collaboration within and between Centennial schools, such as ability to save PBL curriculum in shared folders and view a common PBL calendar. Additionally, teachers have access to a teacher directory, equipment lending library, shared curriculum, and a Google+ community. Furthermore, the year-end report stated that administrators attended two PD sessions focused specifically on technology integration.

Is the learning management system useful for identifying effective instructional practices (more efficient, easier, data driven)?

Although CSD has not implemented a formal learning management system (LMS), the district is using Google Apps for Education (i.e., Google Classroom and team drives) for digital collaboration and organization.

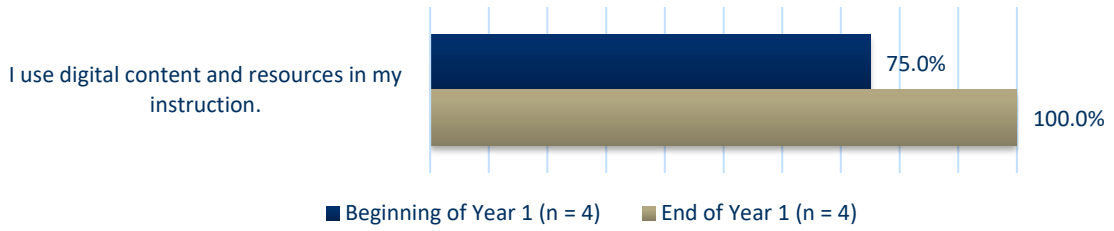
Do teachers have increased access to and use of digital content and resources?

Section Highlights:

By the end of SY 18-19, all Cohort 1 teachers expressed that they use digital content and resources in instruction, students have adequate access to technology, students are more comfortable using digital tools for learning, and students are more able to work independently. Student survey responses indicated that students are largely satisfied with the current technology availability, though some expressed desire for more or less technology. Of those who desire more technology availability, students most often requested additional use of computers or availability of phones, tablets, applications/websites, or virtual reality tools.

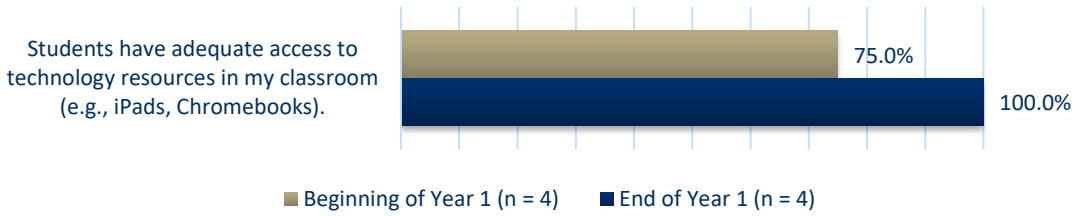
Centennial teachers provided reports of how often they use digital content and resources during instruction. Data were provided during both the fall and spring teacher surveys, and results are shown in Figure 12. At the beginning of the year, only one teacher reported that they use digital content and resources "a great deal," while two additional teachers reported "a moderate amount." However, by the end of the year, all four teachers indicated that they use digital content and resources "a great deal."

Figure 12. Centennial Teachers' Use of Digital Content and Resources
(% A Moderate Amount/A Great Deal)



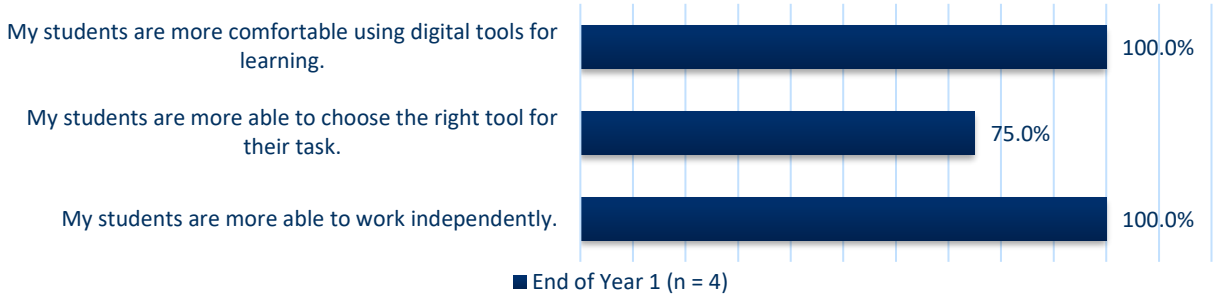
Teachers also rated their perceptions of the adequacy of students' access to technology resources within their classrooms. The responses are shown in Figure 13, which indicates that only three of four teachers felt students had adequate access at the beginning of the year. Teacher perceptions of adequacy of access increased to 100.0% (i.e., all four teachers in Cohort 1) by the end of the year.

Figure 13. Centennial Students' Access to Technology Resources
(% True of me/Very True of me)



Finally, teachers were asked to rate a series of statements comparing their current students to students from their previous year of teaching. As shown in Figure 14 below, all four Cohort 1 teachers agreed or strongly agreed that their students are more comfortable using digital tools for learning and more able to work independently by the end of SY 18-19. Additionally, three of four Cohort 1 teachers agreed or strongly agreed that their students are more able to choose the right tool for their task.

Figure 14. Centennial Year-End Student Technology
(% Agree/Strongly Agree)



During the student survey, students were asked about technology they wish teachers would use. While many students expressed that they were satisfied with the current use of technology and some mentioned desire for less technology, a total of 30 students mentioned computers, laptops, and Chromebooks in their responses. The next most commonly mentioned technology (*n* = 19) was student desire to be able to use phones. Less than 10 students described desire for tablets or iPads (*n* = 9), applications and websites (*n* = 7), and virtual reality (*n* = 5). Table 9, below, lists sample quotes from each category of student responses.

Table 9. Technology Students Wish Teachers Would Use

Theme	Sample Quotes
Laptops/Computers (n = 30)	• *"I like computers because you can use them for many different things."* • *"I think that the computers are fine and we don't need anything else."* • *"Computers, because I can do it at home too."* • *"Just the Chromebooks because typing is quicker and easier."*

Theme	Sample Quotes
Phones (n = 19)	• *"I wish teachers would let us use our phones as an option."* • *"I wish we could use our phones because then we wouldn't have to worry about the teachers blocking our screens. I think they spend too much time talking and explaining the same thing over and over again."* • *"A phone because I feel comfortable with my phone rather than being monitored on Chromebooks every time I search something up because it's nerve-wracking."*
Tablets/iPads (n = 9)	• *"iPads so we can take them around, write notes and make note cards and even keep track of stuff. Have one assigned to you for your time throughout middle school. Or even high school. This way kids can have things digitally and help keep grade up."* • *"iPads because they are more portable and are simple to use."* • *"I wish that my teachers would use iPads for work because you can carry them around not like Chromebooks"*
Applications and Websites (n = 7)	• *"More studying tools and helpful guides."* • *"To incorporate more creative projects where the student is in charge of their own mind and learning and do some fun activities or games (online or offline) to engage the learner and help them practice."* • *"I wish we would use Kahoot more to quiz us."*
Virtual Reality (n = 5)	• *"I think they should use more hands-on technology. Like creating diagrams or designing models by using technology. Maybe 3-D printers and/or virtual reality."* • *"In all of our classes except math maybe we could use VR headsets so we could see in our bodies or the world around us I think this could open us up to a variety of things instead of the teachers just telling us or having us look at a simple black and white picture, it is also 3D."* • *"Virtual reality, it would help me get a better visual."*

Is there evidence of district wide support for technology integration?

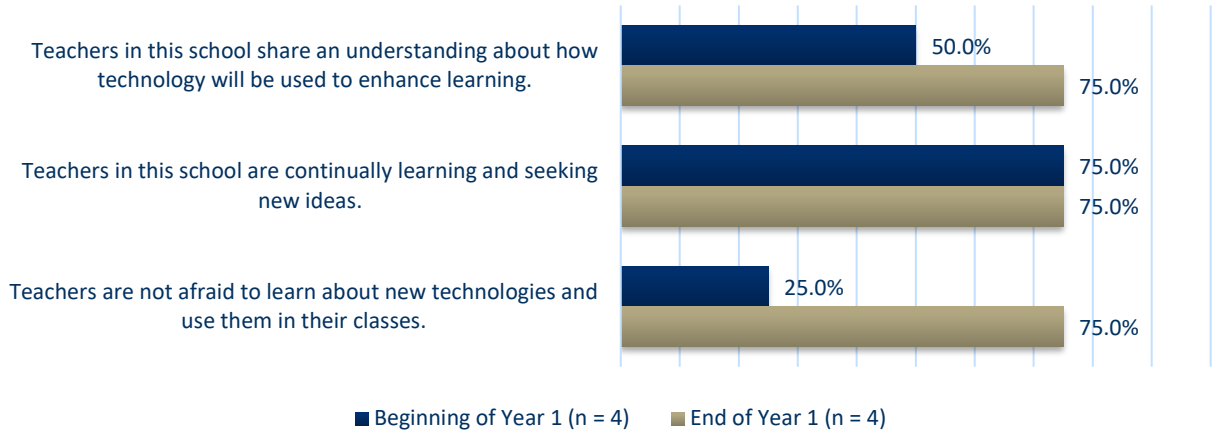
Section Highlights:

By the end of SY 18-19, the majority of Cohort 1 teachers agreed or strongly agreed with all statements regarding teacher culture of support for technology integration, representing an increase from the beginning of the year. Additionally, interviews indicated that the culture is largely supportive of teachers' and students' needs around technology integration, but that some opportunity for growth remains.

During the teacher survey, teachers were asked to rate their agreement with several statements regarding school culture of support for technology integration. Figure 15 displays teacher ratings. At the beginning of SY 18-19, only half of teachers agreed or strongly agreed that teachers in their school share understanding of how technology will be used to enhance learning. Additionally, only one of four teachers agreed or strongly agreed that teachers are not afraid to learn about new technologies and use them in classes. By the end of SY 18-19, three of four teachers agreed or strongly agreed with each of

these statements. There was no change in the percentage of teachers who agreed or strongly agreed that teachers in their school are continually learning and seeking new ideas.

Figure 15. Centennial Teacher Perceptions of a Culture of Support for Technology Integration
(% Agree/Strongly Agree)



In line with results of the teacher surveys, qualitative interview data showed that the culture of support for technology integration is building at CSD. One leader shared:

> *It's been amazing. It's been transformative. We, like I said, we were technology poor until this, and most of the money that we had as a building was spent on trying to secure technology slowly or after a year, and that's just really revolutionized the way that our teachers have been able to teach, and students access information, and then coupled with PBL, and really trying to integrate that with STEM. It has changed the culture of our building.*

Teachers and leaders both described some fear and hesitation around technology that seems to be dissipating with time and exposure to technology. Teachers expressed that they felt supported by the STEM coach and other teachers in their cohorts, and leaders reiterated the support and excitement they saw among staff. One interview participant said:

> *This can be a tough staff. They're all veteran teachers, and there's a lot of really positive things that come with having a staff of veteran teachers, and I appreciate all of those things. At the same time, I think sometimes it can be hard to convince people to try something new because they're kind of accustomed to doing it a certain way. So, I've actually been really pleased with how – initially, I think there was a little bit of skepticism around project-based learning and why should we try something new? But, what I suspected from the start, and I think this happened to a degree, is that the people who have been able to kind of jump into it and give it a go have been*

really excited about what they've seen in terms of what it's meant for their teaching practice and how it's positively impacted the students. And then from that, because of the way that we had a pretty small first cohort, so, we've had some teachers that are not even in the first cohort just jumping in alongside their colleagues trying some new things. Because they're really excited about what they've seen. So just even implementing what we ask people in the cohort to do, to implement two projects this year, and that's happened. And our coach has been really good about documenting things and collecting student feedback. So, we have some remarks from students, like it's more fun. It's more hands-on. They've seen more connections to their lives and to other subjects. It's been really good to see that.

One area for continued improvement that some teachers mentioned centered on the increased workload and job demands that have resulted from the changes in instructional strategies and technology integration. One teacher said, "I think the district often forgets how much they're asking us to do when they add new things without taking off the old stuff. And so I don't know. That's something that happens regardless of the TechSmart grant."

Another leader emphasized that opportunity for continued growth and improvement remains, due to the early stage of grant implementation, saying, "Yes, I feel like we're really supported, but it also feels like we're in really early stages and we don't necessarily have systems yet. I think there's been a lot of freedom for teachers to use things as they wish and sort of get the level of support that they're asking for. Like, I've been doing a lot more of just one-on-one and as things come up I will help teachers. […] Teachers can contact us and we can help get that stuff up and running. But I wouldn't say we're taking like a systems approach to that quite yet."

Do parents have an increased understanding and utilization of districts' technology assets?

Section Highlights:

Parents and families are being engaged through informational sessions and presentations, as well as through technology-based communications with teachers via use of Remind. Some parents have had opportunities to receive TechSmart-specific information and interact with new technology from the school. Additionally, the district has created a website with centralized information about technology use for the community to access.

Teachers shared examples of how they use technology to communicate and share with parents. It seemed that all Cohort 1 teachers use Remind to send information to parents. One teacher said:

I started using [Remind] a couple of years ago and I convinced the rest of my team and so now all four of us use it to communicate with parents. We send out homework reminders and, like, reminder that there's a field trip on Monday, and people write back with questions. It's great.

Interview participants also discussed the district's larger efforts to communicate about technology use, which include both parents and the community as a whole. One leader shared, "We've got community information that goes out, but whether it's targeting specific districts or not is really for community and letting them know what's going on and how we're able to do it." In the year-end status report, the district shared more detail about these communication efforts. The status report describes use of a TechSmart information table at an informational night, which provided information about the grant and allowed families and students to try out some of the grant-purchased science equipment. Additionally, the status report describes efforts to share more information on the district website, and to inform families of the website's presence and availability with a QR code and bookmarks and posters. The district estimates that at least 50 families interacted with grant materials or viewed the website during the informational event. The website is also more widely available via a prominently featured button on the school website.

Other parent- or family-related events included a presentation by Portland Police Officers about the dangers of unmonitored social media accessed by teens, which provided resources to help parents monitor and protect students, as well as a session conducted by the Latino Network, which shared information about school and how to navigate resources and communication. A family empowerment session conducted with Northwest Family Services also discussed some issues around social media and its impacts on the family connection. Nearly 100 parents in total attended these sessions.

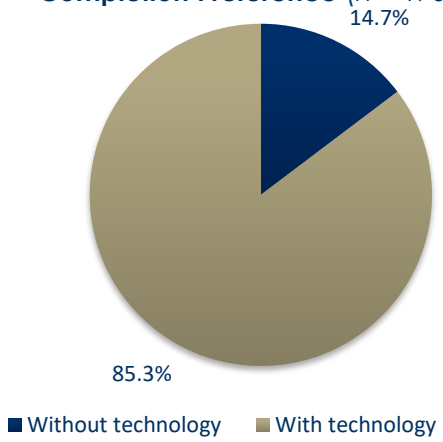
Are an increased number of students utilizing and engaging with new technology?

Section Highlights:

Approximately 85% of students would prefer to complete an assignment with technology, indicating evidence of student support for technology integration and engagement with technology.

As mentioned in previous sections, student engagement appears to have increased as technology integration and PBL strategies have been more widely implemented by Cohort 1 teachers. Figure 16 displays the percentage of students who responded that they would prefer to complete an assignment with or without technology. In total, 85.3% of students indicated they prefer completing assignments with technology than without, while 14.7% indicated they prefer not to use technology for assignments.

Figure 16. Centennial School District Student Assignment Completion Preference (n = 170)



Visible Leadership

District leadership is actively involved and working with key communities to accomplish change.

Are districts identifying effective instructional practices and disseminating information and results to other districts?

Section Highlights:

The CSD year-end status report and interviews with district leaders both indicated that CSD made several efforts to identify and disseminate information and results to other districts. Members of CSD leadership and staff attended several groups and consortia throughout SY 18-19, and CSD plans to build a PBL collective in the region during SY 19-20. Leaders described CSD's STEM coach as active in sharing information with other districts.

The year-end status report indicated that CSD staff met repeatedly with other Multnomah County school district coaches and administrators during SY 18-19, including Gresham-Barlow, David Douglas, and Reynolds school districts. Members of CSD attended meetings of the East County Technology Consortium, East Metro STEAM Partnership, MESD curriculum directors' monthly meeting, and the 2nd Annual Shared Learning event from the MHCRC. The STEM coach from CSD shared progress with technology use and PBL unit development and described TechSmart grant activities to administrators and teachers across other school districts. CSD's partnership with Gresham-Barlow School District was described as "the most extensive" of the East County school districts, based on similar goals to integrate PBL strategies. Another fruitful partnership is that with schools in both Camas and Vancouver, Washington. These relationships have provided planning and curriculum documents, Physics PBL units, and a model for planning and sharing of unit calendars to coordinate whole-school curricula.

CSD is also beginning to launch their own initiatives to advance understanding and implementation of PBL strategies in the region. According to the year-end status report, CSD hoped to launch a regional "PBL collective" and host an annual meeting within the district during SY 19-20. With this effort, CSD hopes to bring together teachers and administrators from any regional schools working to implement PBL, as well as to provide opportunities to share resources and build community around PBL work.

While describing efforts to share information with other districts, CSD's STEM coach shared in her interview about her efforts to communicate with other coaches, saying, "We've been having our regular meetings with each other. So I think we've been sharing a lot that way. I think some of the feedback the coaches were giving, actually, at the conference, which was interesting to me, because I didn't have the same context being new, but they said, you know, last year it was kind of a big deal for them to go, because they finally got to hear what other people were doing, but this year it didn't feel as like, you know – because we kind of knew what each other is doing. So it might have felt that way more for administrators, but for the coaches, I think we've been feeling pretty connected this year."

Do teachers feel increased support from district leaders regarding technology integration?

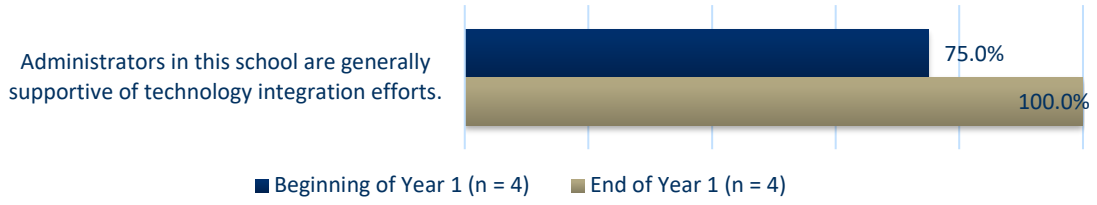
Section Highlights:

By the end of SY 18-19, all four Cohort 1 teachers agreed or strongly agreed that administrators at CSD are generally supportive of technology integration efforts. Additionally, teachers described professional development opportunities and onsite support from the district to assist with technology integration.

By the end of the first year of implementation, all four Cohort 1 teachers agreed or strongly agreed that administrators at CSD are generally supportive of technology integration efforts, representing an increase from perceptions at the beginning of the year. Results are displayed in Figure 17.

Figure 17. Perception of Administrators' Support of Technology Integration

(%Agree/Strongly Agree)



When asked about support received from the district during interviews, most teachers who were interviewed mentioned PD opportunities and the in-person support received from the STEM coach and other district personnel. One teacher said, “Well, our district technology people have provided some [support], like, our principal tries to have different professional development so you get to choose. Like, they will offer things that people have asked for and then you get to choose. The technology people, the technology department, and the district have provided lots of different technology-based professional development ideas. Like, there's only been maybe four or five this year for people who still are learning Google Classroom or who, you know, are ready to move on and do other things. And then kind of on a case by case basis, they're available to help you with whatever you want to use in the classroom.”

Data-Driven Improvement

Current, relevant, and high-quality data from multiple sources are used to improve schools, instruction, professional development, and other systems.

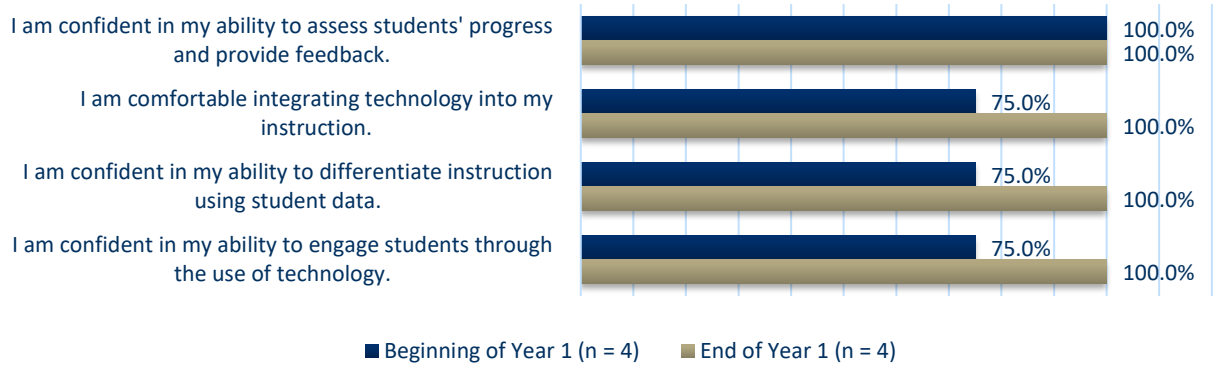
How are schools using data to improve instruction, professional development, and student performance?

Section Highlights:

Data from SY 18-19 indicates that CSD teachers are using data to improve instruction and advance student outcomes. By the end of SY 18-19, all Cohort 1 teachers reported confidence and comfort with data-driven strategies covered in the teacher survey. Additionally, teachers provided examples of use of data-driven instructional strategies during interviews and in the year-end status report.

Teachers from Cohort 1 worked throughout SY 18-19 to increase use of data to improve instruction and student outcomes. Figure 18 displays teachers' ratings of agreement with several statements about data-driven improvement. At the beginning of the year, only three of four teachers agreed or strongly agreed that they were comfortable integrating technology into instruction, confident differentiating instruction using data, and confident engaging students using technology. By the end of the year, all four Cohort 1 teachers agreed or strongly agreed with these statements. There was no change in teachers' confidence in assessing students' progress and providing feedback, as all four teachers agreed or strongly agreed they were confident at both the beginning and end of SY 18-19.

Figure 18. Centennial Data-Driven Improvement
(% Agree/Strongly Agree)



An additional survey question asked teachers to report the extent to which they are using formative assessments. Results showed that all teachers from Cohort 1 indicated they use formative assessments "a great deal" at the beginning of SY 18-19, but only three of four teachers selected "a great deal" at the end of SY 18-19. The year-end status report provided additional information about teachers' use of formative assessments. One teacher was quoted in the year-end status report as saying, "I've used Chromebooks for formative assessments in Google and Desmos. It was a great way to quickly assess where individuals were struggling with a specific target." Another teacher reported, "Having Chromebooks for every student at the ready meant I could use sites like Desmos and GeoGebra in lessons, which allowed for

students to interact more with the material and with one another. It also allowed me to do more differentiated review using Khan Academy."

During interviews, teachers confirmed their increased use of formative assessments and data-driven learning strategies. One teacher said: "I like to use little online quizzes. You can do the same thing with paper, but it's nice that they can access them at home and then we correct them and they use them to study from. They can see what mistakes they've made before we get to the end of the unit. And they're a lot more motivated to retake things and try to improve their score when it's on the computer, it seems like. So some of the tech—some of the programs, like Google Forms, will tell you, like, these are the questions that were most frequently missed. It's a lot faster. And so I just say, like, okay. I need to reteach that to everybody, or, like, these are the kids and I'll just make a list of the kids, too, kind of start a little lower and then I can go in and see exactly which forms they meant and make a note of that so that I can check in with them before the end of the unit and try to shore up whatever it is that they're missing."

During interviews, another teacher provided an example of formative data use. They shared, "A lot of times as we get close to the end of a unit I'll have them do a self-reflection, you know, how well do you feel you know this, what activities were useful for you, what activities weren't, questions you have for me? It provides a way for them to give feedback to me on what's working, any questions they have, and then I take those and go back to the – well, there's a really nice feedback list there. The other nice thing with formative instruction is if I do a pre-test and then I do a post-test and everything's posted online, it's really easy for them to go back and see how much they've grown."

Funding & Budget

District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.

Have districts identified at least one opportunity for repurposing resources to support technology integration?

Section Highlights:

CSD leaders made several efforts to repurpose resources during and in preparation for SY 18-19. The year-end status report and leader interviews described efforts to use non-TechSmart funds to pay teachers for their time in TechSmart-related PD, efforts to repurpose committee time toward TechSmart support, and use of Title IIA funds to partially support the district's STEM coach.

CSD leaders provided examples during interviews of how resources have been repurposed to support technology integration. They emphasized efforts to repurpose some of teachers' time toward professional development, planning, and preparation related to the TechSmart grant. One leader said, "We've done things to help support the TechSmart piece, like with the problem-based learning, providing professional development to teachers during the summer, and time so that they can work, and even time within the school year, so they may be excused from a committee to be able to really get to work on creating some valuable, engaging lessons."

Related to funding in particular, the year-end status report described several ways in which resources have been repurposed toward goals associated with TechSmart implementation. First, the report stated that federal Title IIA funds, state general funds, and Measure 98 funds have been repurposed to pay teachers for their time in participating in TechSmart-related PD. Second, the report describes how the district repurposed staff committee time so that teachers could focus on PBL as a committee option during SY 18-19 and SY 19-20. Finally, the district's STEM coach is .1 funded from Title IIA funds and is using those four hours per week to support teachers in grades 6 to 12 with alignment of science curriculum, instruction, and materials.

One district leader elaborated on the details provided in the year-end status report during her interview:

> *What we budgeted in our TechSmart grant to pay for our STEM coach didn't actually end up paying for her full salary because of all the experience and education that she has. So, we repurposed some of our district Title IIA allocation to cover the rest of her FTE. And we also have been using our Title IIA funds to pay the district match for the professional development in terms of paying teachers for their time. We've also used some of our general funds to support some work that's happening with sixth grade science in order to help have that vertical articulation. […] Our STEM coach] has been such a huge benefit to the work of our district that I'm kind of already thinking – I'm trying to think about how can we keep her past this grant because it's made a huge difference.*

Strategic Planning

District strategic plan reflects shared commitment to improving outcomes for students.

Does the district's strategic plan reflect shared commitment to improving outcomes for students?

Section Highlights:

Although it appears from interviews with CSD leaders that technology is not specifically discussed in the district's strategic plan, leaders are committed to efforts to improve outcomes for students. Leaders described the importance of PBL to the instructional strategy of the school and emphasized efforts to offer teachers high-quality PD opportunities that benefit students' learning. Leaders also described efforts to integrate TechSmart-related goals and strategies into the overall vision and strategy of the district/school.

Interviews with district leaders revealed that, while technology may not yet be specifically described in the strategic plan for CSD, leaders and staff worked hard in SY 18-19 to integrate technology and PBL strategies into the vision and overall strategy of the district and school. One district leader said, "It's not specifically called out in our strategic plan, but we're trying to be intentional about integrating tech into our PD and also offering professional development that would be appropriate for teachers and administrators across the district."

Another interview showed the integration of PBL strategies into larger district vision and strategy. The participant shared, "It's been really focused on the middle school, at least for this year and next, and rolling into the high school, overall. But the huge part is I moved to PBL, project-based learning, and being able to get some really quality professional development beyond what we were typically able to do financially, and have it systematic so that within the three years, two to three years, we hope to have all teachers trained in project-based learning." Other leaders emphasized the importance of PBL to the school's strategy:

> *One of the things that I talked to the principal about at the school was, this project can't feel like an add-on initiative. So, we've been looking for ways to integrate the work of this project into the school system. So, one example of that is every teacher is required to participate on a schoolwide committee. So, we were able to work with the principal to have a PBL committee, and that way the – we have a mix of people on that committee, from people in the first cohort to other people that couldn't do the PD over the summer and therefore couldn't be in the cohort, but they're just interested in it. So, we're trying to look for ways to make this the work instead of making this the extra thing that people have to do in addition.*

Engaged Communities & Partners

Parents, stakeholders, community groups and others are actively and systemically involved in helping students develop, learn, and achieve.

Do district leaders demonstrate increased communication with and among outside stakeholders regarding technology integration?

Section Highlights:

Efforts to connect with stakeholders from the community included development and advertisement of a website related to TechSmart efforts, as well as informational sessions for parents and families that focused on various issues around use of technology, such as social media.

Throughout interviews and the year-end status report, leaders from CSD emphasized several methods used to communicate with the community, including but not limited to families and parents. While several events hosted by the district were targeted specifically at parent engagement (e.g., sessions conducted by community stakeholders, such as police officers and family services groups, to teach about the dangers of unmonitored social media use and impacts on family connection), other efforts targeted the community at large. For example, the district worked to build a website related to TechSmart initiatives and shared the website at informational events. For the larger community, the website was made easily accessible through the school homepage.

Evaluation Insights

The SY 18-19 evaluation at CSD produced the following insights:

- Teachers at CSD expressed overall satisfaction with the PD model—particularly the onsite support provided by the district STEM coach. Leaders shared satisfaction with the STEM coach and discussed efforts to figure out how to maintain STEM coach presence following the end of TechSmart funding, due to perceived value of the STEM coach. In general, teachers desired increased amount and frequency of PD opportunities, but remained satisfied with those opportunities offered during SY 18-19. Some interview participants (both teachers and leaders) hinted at challenges around the balance of PD topics, indicating that teachers may be stressed by the added demands of implementing TechSmart on top of ongoing initiatives and PD in the district. Some teachers also requested additional PD that was technology-specific, as much of the PD offered during SY 18-19 was focused on PBL strategies.
- Participants from all samples—the leader sample, teacher sample, and student sample—emphasized the value of both technology access and PBL strategies throughout interviews and survey responses. Leaders described PBL as the central focus of district change, emphasizing how technology is viewed as a tool to assist with larger changes in instructional strategies. Teachers shared ways that both PBL and new technology have changed their teaching and classroom interactions. Students mentioned increased engagement from both use of technology and projects/PBL. Some students expressed that they wish for less technology use, but this portion of the student population was relatively small. The vast majority of students expressed neutral or positive opinions of changes in instruction and technology integration.
- While student achievement data was not yet available for a length of time supporting its inclusion in the SY 18-19 report, student opinion data from the student survey indicated most students feel increased use of technology is benefitting their education. Almost 94% of students expressed desire for the same or more technology next year, and over half of students reported that they "enjoyed" increased use of technology in classrooms. A total of 67.1% of students reported that technology gives them opportunities to learn many new things, and 51.2% of students said they felt more interested in class activities using technology. In qualitative responses, students shared how technology is helpful for learning and retention, fun and enjoyable to use, helpful for focusing, helpful for research and organization, and more convenient and efficient to use. The students who shared more negative opinions of technology largely did so because of preference for non-technology modes of instruction or dislike of teachers' roles with technology (e.g., feelings that the teachers are not as helpful when technology is included in lessons).
- Most teachers and leaders expressed it was too early to tell whether increased use of technology and PBL strategies is impacting student achievement outcomes or closing the achievement gap with at-risk student subgroups.
- CSD seems to have a generally positive culture around support for technology integration. Teachers reported supporting each other, and leaders expressed pride in the progress made since TechSmart implementation began. The district is showing support for TechSmart goals by providing and repurposing some resources and working to integrate and support both technology and PBL. Participants seem to share hope that TechSmart will benefit student outcomes.

Appendix A. Evaluation Planning Tool

The following planning tool includes the TechSmart Initiative logic model, evaluation plan, and timeline. The logic model and evaluation plan have been designed to align with the MHCRC Framework for Successful Technology Implementation as described below. Pacific Research and Evaluation will work with MHCRC and each district to create a district specific program evaluation plan utilizing the tools in this document. The goal of utilizing this model is to provide consistency in the evaluation of projects across the TechSmart Initiative.

MHCRC Framework for Successful Technology Implementation: The framework includes seven factors that have been identified as essential to effective transformations to technology rich teaching and learning environments. As you can see, the components do not stand in isolation from each other; many components are linked and substantially overlap.

- Teaching Effectiveness: District supports regular, inclusive and shared professional development among teachers.
- Digital Age Learning Culture: District embraces cultural shift and views technology as positive.
- Visible Leadership: District leadership actively involved and working with key communities to accomplish change.
- Data Driven Improvement: Current, relevant and high quality data from multiple sources are used to improve schools, instruction, professional development and other systems.
- Funding & Budget: District's budget repurposes resources and seeks outside funding to focus on promising practices and technology supports.
- Strategic Planning: District strategic plan reflects shared commitment to improving outcomes for students.
- Engaged Communities & Partners: Parents, stakeholders, community groups and others are actively and systemically involved in helping students develop, learn and achieve.

GOAL 1: School districts funded by MHCRC grant investments will understand and implement effective instructional strategies and practices that use technology to foster improvement in academic outcomes for all students.

GOAL 2: The MHCRC and school districts will validate and disseminate effective instructional strategies and practices that use technology to foster improvement in academic outcomes for all students.

ACTIVITIES	OUTPUTS	SHORT TERM OUTCOMES – Y1-2 (TEACHING OUTCOMES)	INTERMEDIATE OUTCOMES – Y3-5 (STUDENT OUTCOMES)	LONG TERM OUTCOMES --Y6+
What are the key elements of the districts' project plans?	*What are the direct results of our activities?*	*What changes do we expect to occur within the short term?*	*What changes do we want to occur within the scope of the project?*	*What changes do we hope will occur over time?*
Teaching Effectiveness • Districts create a systemic PD plan, which includes technological, content and pedagogical knowledge. • Districts offer relationship based PD that includes the following components: a) Using technology effectively, b) implementing evidence-based instructional strategies. • Teacher PD familiarize teachers with the MHCRC Common Criteria*. • Districts provide technology support on-site for teachers. • MHCRC and districts identify and evaluate effective instructional practices using the Common Criteria*.	• Number of teachers who participate in PD annually. • Number and type of shared learning opportunities for teachers and administrators. • Number and type of project-related district learning cohorts (horizontal and vertical). • Number of students in student cohorts. • Number of cohort students representing targeted student subgroups (i.e., ethnic minorities, low SES, ELL's and SWD's).	• PD has helped teachers increase the use of technology for evidence-based instructional practices. • PD has helped teachers use technology to analyze and use data about student learning. • PD has helped teachers use technology to differentiate instruction. • The use of technology has increased teachers' ability to engage students and improve teaching of Common Core standards. • Instructional practices show promise for improving student academic outcomes.	• Student achievement has increased in one or more AHR outcome, as measured by student growth over time. • The rate of student growth in one or more AHR outcome is greatest for at-risk student subgroups (i.e., ethnic minorities, low SES, ELL's, SWD's, and those not on track to meet academic standards). • There is a positive correlation between teacher implementation of instructional practices and student AHR academic outcomes. • The positive correlation between teacher implementation of instructional practices and	• Instructional practices are transferable to varied classrooms or academic settings. • Longitudinal data show sustained and/or ongoing progress in relevant AHR outcomes.

			improvement in AHR academic outcomes has been replicated in multiple academic settings.	
<u>Digital Age Learning Culture</u> • Districts conduct an assessment of physical technology assets and how assets are being used. • Districts use a learning management system to provide data about student achievement. • Districts use learning management systems to identify and validate effective practices. • Districts have a system to provide digital content and resources across a district. • Districts provide trainings for parents to understand technology integration.	• Number of technology assets being used. • Number of teachers and administrators using the learning management system. • Number of parent trainings offered. • Number and percentage of parents attending training.	• The use of technology to support instructional practices has increased. • The learning management system is useful for identifying effective instructional practices (more efficient, easier, data driven). • Teachers have increased access to and use of digital content and resources. • There is district wide support for technology integration/innovation. • Parents increase understanding and utilization of districts' technology assets.	• An increased number of students are utilizing and engaging with new technology.	• Technology integration is seen as a shared responsibility among teachers, district leaders, and parents.
<u>Visible Leadership</u> • Districts participate in cross-project networking to share effective instructional practices.		• Each district identifies one or more effective instructional practices and disseminates information and results to other districts.		• Districts actively exchange data and information about effective instructional practices, so that those practices can be

• Leaders provide clear communication about the district's vision for instructional technology.		• Teachers feel increased support from district leaders regarding technology integration.		implemented and validated in new settings.
<u>Data Driven Improvement</u> • Districts use formative assessments for studying the effectiveness of instructional practices. • Teacher PD includes techniques to use student learning data and differentiate instruction. • Districts evaluate projects in relationship to their project-specific logic models and continuously adjust project activities based on evaluation data.	• Percentage of teachers using formative assessments.	• Teachers increase their use of formative assessments to identify effective instructional practices. • Teachers have increased ability to assess students' progress and provide feedback. • Teachers have increased ability to differentiate instruction using student data.	• Differentiated instruction improves student learning outcomes.	
<u>Funding and Budget</u> • Districts allocate adequate funding for technology transitions. • Districts seek funding for sustaining technology integration.	• Number and percentage of students with access to technology.	• Districts have identified at least one opportunity for repurposing resources to support technology integration.	• Student learning outcomes provide evidence to support continued funding in order to sustain technology integration.	• District resources sustain and enhance technology based instructional practices.
<u>Strategic Planning</u> • Districts' strategic plans prominently include technology as well as		• Diverse stakeholders are involved in developing the technology components of strategic plans.	• Evaluation data inform active strategic planning over time.	

mechanisms for scaling programs. • Districts identify long range plans to fund technology and PD supports.				
<u>Engaged Communities & Partners</u> • District leaders maintain effective communication with outside stakeholders regarding technology integration. • Districts create structures to support communication among stakeholders (e.g. website, community meetings).		• District leaders demonstrate increased communication with and among outside stakeholders regarding technology integration.		

Appendix B. Teacher Survey

MHCRC TechSmart Teacher Survey

Introduction

You are receiving this survey because you have participated in technology-related professional development or training as part of your school's TechSmart grant funded by the Mt. Hood Cable Regulatory Commission (MHCRC). MHCRC has partnered with an external evaluation company, Pacific Research and Evaluation, to conduct an evaluation of these grants and to learn about the effective instructional teaching practices that have emerged. A key element of this evaluation is to hear directly from teachers.

This survey will ask about your experience with technology-related professional development, new ways you have incorporated technology into your instruction, and other questions related to technology use. Your responses to this survey will go directly to Pacific Research and Evaluation and will only be shared with your school in aggregate form. We appreciate you taking 15 minutes to complete this survey.

This survey will ask you to report your PEID. We are asking for your PEID so Pacific Research and Evaluation can address research questions requiring analyses of how teachers implementation of instructional practices influences student outcomes. This information will in no way be used for purposes of teacher evaluation and will only be seen by these external researchers.

If you have questions about this survey, please contact Kristi Manseth at Pacific Research and Evaluation (Kristi@pacific-research.org).

Clicking on the "Next" below indicates that you understand that you do not have to answer any question(s) you choose not to answer. In addition, you understand that your identity will not be revealed in any way except to the researchers at Pacific Research and Evaluation involved in the TechSmart project, and that the results will not be reported in a way that will reveal individual participants.

Background Questions

1. **Please indicate your ID**
2. **What grade level(s) do you currently teach? (Mark all that apply)**
   - *Response options for this item will be tailored to the targeted grades for each project*

3. **How many years have you taught at the K-12 level?**
   - 0-2 years; 3-5 years; 6-10 years; 11-20 years; 21-30+ years
4. **What is your school?**

Professional Development Dose (Post Only)

5. Indicate the number of hours spent in technology-related group professional development (PD) over the past school year. (0 hours; 1-8 hours; 9-16 hours; 17-32 hours; 33 hours or more)
    - Please rate the extent to which this group PD was useful for integrating technology into your classroom (1 = Not at all useful; 5 = Extremely Useful)
6. Indicate the number of hours spent in technology-related professional development (PD) in the form of individualized training/coaching over the past school year. (0 hours; 1-8 hours; 9-16 hours; 17-32 hours; 33 hours or more)
    - Please rate the extent to which this individualized PD was useful for integrating technology into your classroom (1 = Not at all useful; 5 = Extremely Useful)
7. How effective has your TechSmart grant's professional development model been in terms of helping you change your instruction? Do you have suggestions for improvement?

Technology Skill Level

8. **Choose the statement that best describes the level of your technology skills. Please choose *only one* of the following:**
    - I get someone else to do technology-based tasks for me. (1)
    - I accomplish assigned tasks, but I am more efficient when I don't use technology to do a job. (2)
    - I have enough skills to complete the management and communication tasks expected of me and occasionally will choose to use technology to accomplish something I choose. (3)
    - I use a variety of technology tools and I use them efficiently for all aspects of my job. (4)
    - I use technology efficiently, effectively and in creative ways to accomplish my job. (5)

Technology Integration (• 1 – Very untrue of me • 2 – Untrue of me • 3 – Somewhat untrue of me • 4 – Neutral • 5 – Somewhat true of me • 6 – True of me • 7 – Very true of me)

Rate the extent to which the following statements are true or untrue of you.

9. I alter my instructional use of classroom technology based upon the newest applications and research on teaching, learning, and standards-based curriculum.
10. I integrate the most current research on teaching and learning when using the classroom technology.
11. I plan technology-related activities in my classroom that will improve my students' basic skills (e.g., reading, writing, math computation).
12. I seek out activities that promote increased problem-solving and critical thinking using classroom technology
13. Students have adequate access to technology resources in my classroom (e.g., iPads, Chromebooks)

Teacher Support (Innovative Culture): (1 = Strongly Disagree; 5 = Strongly Agree)
Please indicate the extent of your agreement with each of the following statements. 5-point agreement scale

14. Teachers in this school share an understanding about how technology will be used to enhance learning.
15. Teachers in this school are continually learning and seeking new ideas.

16. Teachers are not afraid to learn about new technologies and use them with their classes
17. Administrators in this school are generally supportive of technology integration efforts.

Frequency of Technology Use: (1 – Never, 2 – Rarely, 3 – Occasionally, 4 – A moderate amount, 5 – A great deal)

Please answer the following questions looking back at the **2016-17** school year.

18. How often did you create lesson plans that incorporate technology?
19. How often did you use technology to deliver instruction to your class?
20. How often did you adapt an activity to students' individual needs using technology?
21. During class, how often did students work individually using technology?
22. During class, how often did students work in groups using technology?

Logic Model Outcomes

Please rate your agreement on the following items (1 = Strongly Disagree; 5 = Strongly Agree)

23. I am confident in my ability to assess students' progress and provide feedback
24. I am comfortable integrating technology into my instruction
25. I am confident in my ability to differentiate instruction using student data
26. I am confident in my ability to engage students through the use of technology
27. I have identified effective instructional practices that use technology (Post Only)
    - Please provide an example of an instructional practice utilized in your classroom. (Post Only)

Please how frequently you do each of the following (1 – Never, 2 – Rarely, 3 – Occasionally, 4 – A moderate amount, 5 – A great deal)

28. I use technology for evidence-based instruction
29. I use technology to differentiate instruction
30. I use formative assessments to identify effective instructional practices
31. I use technology to analyze data about student learning
32. I use digital content and resources in my instruction

33. **Please list and rate the effectiveness of new technology related instructional practices that you have integrated into your classroom this year. (List up to three practices) (POST Only)**

_____	**1**	**2**	**3**	**4**	**5**
_____	**1**	**2**	**3**	**4**	**5**
_____	**1**	**2**	**3**	**4**	**5**

Please rate how much you agree or disagree with the following statements about your current students in comparison with your students in the 2015-16 school year. (POST Only)

34. My students are more comfortable using digital tools for learning.
35. My students are more able to choose the right tool for their task.
36. My students are more able to work independently.

Please rate the extent to which technology supports the following aspects of your instruction. (1 – Not at all, 2 –Very little, 3 – Somewhat, 4 – To a great extent) **(POST Only)**

37. **Planning and Preparation** (including knowledge of content and pedagogy, knowledge of students, setting instructional outcomes, knowledge of and access to resources, designing coherent instruction, and designing student assessments)
38. **Managing Classroom Procedures** (including instructional groups, transitions, materials and supplies, non-instructional duties, and efficient classroom procedures)
39. **Organizing Physical Space** (including safety and accessibility, and arrangement of furniture and resources)
40. **Communication with Students** (including expectations for learning, directions and procedures, explanations of content, and use of oral and written language)
41. **Using Questioning and Discussion Techniques** (including quality of questions, discussion techniques, and student participation)
42. **Engaging Students in Learning** (including activities and assignments, student groups, instructional materials and resources, and structure and pacing)
43. **Using Assessments in Instruction** (including assessment criteria, monitoring of student learning, feedback to students, and student self-assessment and monitoring)
44. **Demonstrating Flexibility and Responsiveness** (including lesson adjustment, response to students, and persistence)

45. **Please provide examples of how you have used technology to support instruction for at-risk subgroups (students of color, ELL, SPED, low SES) in the areas defined above. (POST Only)**

Appendix C. Teacher Interview Questions

TechSmart Teacher Interview Question 2017 (Y2)

My name is _____. I am a research consultant with Pacific Research and Evaluation. We have asked you to attend this PD because you have participated in professional development or training as part of your school's TechSmart grant funded by the Mt. Hood Cable Regulatory Commission (MHCRC). MHCRC has partnered with our organization to conduct an evaluation of these grants and to learn about the effective instructional teaching practices that have emerged. A key element of this evaluation is to hear directly from teachers so we greatly appreciate your time today.

1. Can you start by telling us a little about the professional development you have received as part of the TechSmart grant this year or last?
    a. Technology focus? Instruction?
    b. Formal vs Informal?
2. How effective is this PD model in terms of helping you change your instruction?
    a. Suggestions for improvement?
3. How are you using technology to support new instructional techniques?
    a. Can you give examples of technology related instructional strategies that have been particularly effective in your classroom?
    b. Have any strategies been less effective?
4. Have you experienced any barriers to integrating technology into your classroom instruction?
5. How has your use of technology supported instruction impacted student engagement?
6. A focus of the TechSmart grants is closing the achievement gap. How has the use of technology supported instruction impacted learning for students of color, English Language Learners, those with an IEP, etc.
7. Have you adopted any new practices that show promise for improving student academic outcomes?
    a. How do you know it is improving? Real time data, etc.?
8. What type of support have you received at the district level for using technology to support instructional change?
    a. Is there a culture of support around technology in your school?
9. Do you have any other comments about your PD experience or technology integration?

Appendix D. District Leader Interview Protocol

TechSmart Leadership Interview Questions

1. What are the primary ways that you have seen the TechSmart grant funding impact your district?

2. How do you think the grant funding has impacted teachers' instructional strategies?
    a. Have you seen or heard about new instructional strategies being implemented?
    b. Do you think these instructional practices show promise for improving student academic outcomes?
    c. A focus of the TechSmart grants is closing the achievement gap. How has the use of technology supported instruction impacted learning for students of color, English Language Learners, those with an IEP, etc.

3. How is the district leadership providing support for technology integration/innovation?

4. Have you shared with other districts' what you are doing with your TechSmart grant?
    a. If yes, what type of information have you shared?
    b. If not, do you have plans to share successes with other schools/districts?

5. Has your district or school(s) repurposed resources to support technology integration in classroom learning over the past school year? For example, has the district or a school changed a current staff position role, shifted budget expenditures, changed PD schedules or types in order to support technology integration?

6. How does technology fit into your districts' strategic plan?
    a. Who has been involved in developing these components?

7. In the districts' work to enhance instructional practices through technology integration, have you worked with any stakeholders outside of your district? (community members/parents)
    a. Has this collaboration/communication increased with the grant?

8. Do you have any other comments about the TechSmart grant and the impact within your district?

FOR Principals and coaches only: We do have one additional request for principals and coaches for our evaluation. We have worked with the MHCRC to create a rubric designed to provide feedback on all techsmart teachers as a whole in terms of what kind of instructional changes you have noticed. Rating teachers as a group eliminates confidentiality issues and concerns that teachers are feeling directly evaluated as part of this program evaluation. We have this rubric available through an online link that we will send to you upon completion of this interview. It should only take 5 minutes to complete and we'd like your feedback within the next week. Does this sound okay?

Appendix E. Student Survey

TechSmart Initiative Student Survey

This survey will ask you some questions about the technology that has been used in your classes this year. Please answer the questions below honestly and to the best of your ability. Your responses will not affect your grade in class and will not be shared with your teacher. Thank you for your participation!

(Note: When the survey uses the word "technology," it refers to the use of computers, iPads, etc.)

1. What grade are you in?
- 9th
- 10h
- 11th
- 12th

2. Rate the following items from Strongly Disagree to Strongly Agree
- The use of technology in my classes has increased since last school year.
- I have felt more interested in class activities using technology compared to activities in which technology is not used. (Consider iPads, etc.)
- I like receiving instruction through technology.
- I concentrate better in class when technology is used to deliver instruction.
- I would work harder if my teacher used technology more often.
- I know that using technology gives me opportunities to learn many new things.
- I can learn many things when my teacher uses technology.
- I believe that the more often teachers use technology, the more I will enjoy school.

3. The use of technology in my class this year…
- Helped me stay focused.
- Did not affect my learning.
- Seemed to distract me.

4. When it comes to your learning, which of the following generally describes your experience with new technology tried in class this school year.
- The technology helped me learn more.
- Technology had a neutral impact; I learned the same amount whether I had technology or not.
- The technology slowed my learning.

5. Of the activities listed below, which TWO kept your INTEREST most in class in the last year? (Mark 2 choices)
- Lecture/presentation by teacher

- Large group work
- Small group work
- Reading/working by yourself
- Completing worksheets, posters, study guides, textbooks, questions, etc.
- Using apps (on iPads, Chromebooks, etc.)
- Using computers (typing, researching, creating presentation)
- Watching movies/films

6. Of the activities listed below, which TWO do you feel you LEARNED the most from in class in the last year? (Mark 2 choices)

- Lecture/presentation by teacher
- Large group work
- Small group work
- Reading/working by yourself
- Completing worksheets, posters, study guides, textbooks, questions, etc.
- Using apps (on iPads, Chromebooks, etc.)
- Using computers (typing, researching, creating presentation)
- Watching movies/films

7. I generally _____ using more technology in my classes this school year.

- Enjoyed
- Felt neutral about
- Disliked

8. After using more technology in my classes lately, I hope my teachers next year use…

- Less technology overall
- About the same amount as this year
- More technology overall

9. If you were given the choice to complete the same assignment with or without the use of technology, which would you generally choose?

- With technology
- Without technology

10. I generally _____ learning in class when technology is incorporated.

- Enjoy
- Feel neutral about
- Dislike

11. What technology do you wish your teachers would use? How would this help you to learn or make school more meaningful for you?

12. After trying some new technologies in my classes in the last year, how, if at all, have your opinions changed about teachers incorporating more technology into lessons? Explain.

Appendix F. Leadership Rubric

Pacific Research and Evaluation is contracted by the Mt. Hood Cable Regulatory Commission (MHCRC) to conduct an evaluation of the TechSmart Initiative and to learn about the effective instructional teaching practices that have emerged. A key element of this evaluation is to learn how teachers are utilizing technology to support their instruction.

You have been asked to complete this rubric to help provide some feedback on how teachers are utilizing technology to support their instruction. In order to ensure teacher anonymity, this form will ask you to rate all teachers in your district's TechSmart grant as a whole. This form is **not** in any way meant to be evaluative of TechSmart teachers and results will only be used learn about promising instructional practices that have emerged from the TechSmart Initiative.

This form should take approximately 10 minutes to complete. Your responses to this form will go directly to Pacific Research and Evaluation and will only be reported in aggregate form. If you have questions about this survey, please contact Kristi Manseth at Pacific Research and Evaluation (Kristi@pacific-research.org).

Clicking on the "Next" below indicates that you understand that you do not have to answer any question(s) you choose not to answer. In addition, you understand that your identity and the identities of individual teachers will not be revealed in any way except to the researchers at Pacific Research and Evaluation involved in the TechSmart project, and that the results will not be reported in a way that will reveal individual participants.

1. Please select your school district.
    a. David Douglas School District
    b. Gresham-Barlow School District
    c. Parkrose School District
    d. Portland Public Schools
    e. Reynolds School District
2. What is your role within the school district? (This question is optional)
    a. Principal
    b. Coach (TOSA, technology coach, ect.)
    c. Other _____
3. Please Indicate which cohort of TechSmart teachers you are completing this rubric for: (This question was only displayed to leaders from Reynolds School District)
    a. Cohort 1
    b. Cohort 2

Thinking about all your TechSmart teachers as a whole, to what extent do they use technology to support the following… (1 – Not at all, 2 –Very little, 3 – Somewhat, 4 – To a great extent)

1. **Planning and Preparation** (Includes knowledge of content and pedagogy, knowledge of students, setting instructional outcomes, knowledge of and access to resources, designing coherent instruction, and designing student assessments)

2. **Managing Classroom Procedures** (Includes instructional groups, transitions, materials and supplies, non instructional duties, and efficient classroom procedures)

3. **Organizing Physical Space** (Includes safety and accessibility, and arrangement of furniture and resources)

4. **Communicating with Students** (Includes expectations for learning, directions and procedures, explanations of content, use of oral and written language)

5. **Using Questioning and Discussion Techniques** (Includes quality of questions, discussion techniques, and student participation)

6. **Engaging Students in Learning** (Includes activities and assignments, student groups. instructional materials and resources, and structure and pacing)

7. **Using Assessment in Instruction** (Includes assessment criteria, monitoring of student learning, feedback to students, and student self-assessment and monitoring)

8. **Demonstrating Flexibility and Responsiveness** (Includes lesson adjustment, response to students, and persistence)

Can you provide specific examples of how teachers are using technology to support new instructional practices in any of the areas defined above?

Appendix G. Reynolds Walk Through Tool

Appendix H. ELPA21 Proficiency Descriptors

Mt. Hood Cable Regulatory Commission Walk-Through Tool

To be used in the evaluation of strategies being implemented through the Mt. Hood Cable Regulatory Grant.

This survey is non-evaluative and teacher names will not be attached to the data. The data can be shared with the cohort of teachers if they wish, and will be shared with Justin Birmingham and the MHCRC board to review the success of the grant. A data summary may be shared with principals, but cannot identify individual teachers, and only building level data will be shared. The results will be used to inform how to inform the use of technology, prioritize staff development, and increase the working knowledge for staff around integrating technology in secondary Math who are participating in the MHCRC TechSmart Initiative in the Reynolds School District to best-support student learning.

* Required

Date *

mm/dd/yyyy

Building *

Observer First Name *

Teacher First Name *

There is evidence of educational technology in use within the classroom. *

- Yes
- No

Please note the following Standards for Mathematical Practice, when evidence is observed.

(Check all/any that apply)

Make sense of problems and persevere in solving them.
(Check all/any that apply)

- [ ] Find meaning in problems.
- [ ] Look for entry points.
- [ ] Analyze, conjecture and plan solutions pathways.

- [ ] Monitor and adjust.
- [ ] Verify answers.
- [ ] Ask themselves the question: "Does this make sense?"
- [ ] Not observed.

Reason abstractly and quantitatively.
(Check all/any that apply)

- [ ] Make sense of quantities and their relationships in problems.
- [ ] Learn to contextualize and decontextualize.
- [ ] Create coherent representations of problems.
- [ ] Not observed.

Construct viable arguments and critique the reasoning of others.
(Check all/any that apply)

- [ ] Understand and use information to construct arguments.
- [ ] Make and explore the truth of conjectures.
- [ ] Recognize and use counterexamples.
- [ ] Justify conclusions and respond to arguments of others.
- [ ] Not observed.

Model with Mathematics.
(Check all/any that apply)

- [ ] Apply mathematics to problems in everyday life.
- [ ] Make assumptions and approximations.
- [ ] Identify quantities in a practical situation.
- [ ] Interpret results in the context of the situation and reflect on whether the results make sense.
- [ ] Not observed.

Use appropriate tools strategically.
(Check all/any that apply)

- [ ] Consider the available tools when solving problems.
- [ ] Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website, and other technological tools).
- [ ] Make sound decisions of which of these tools might be helpful.
- [ ] Not observed.

Attend to precision.
(Check all/any that apply)

- [ ] Communicate precisely to others.
- [ ] Use clear definitions, state the meaning of symbols and are careful about specifying units of measure and labeling axes.
- [ ] Calculate accurately and efficiently.

- [ ] Not observed.

Look for and make use of structure.
(Check all/any that apply)

- [ ] Discern patterns and structures.
- [ ] Can step back for an overview and shift perspective.
- [ ] See complicated things as single objects or as being composed of several objects.
- [ ] Not observed.

Look for and express regularity in repeated reasoning.
(Check all/any that apply)

- [ ] Notice if calculations are repeated and look both for general methods and shortcuts.
- [ ] In solving problems, maintain oversight of the process while attending to detail.
- [ ] Evaluate the reasonableness of their immediate results.
- [ ] Not observed.

Please note the following 6 Educational Technology Standards, when evidence is observed, as they pertain to math instruction.

(Check all/any that apply)

Students Demonstrate creative thinking and problem solving skills in mathematics to innovative products and processes using (digital) technology.
(check any/all that apply)

- [ ] A. Apply existing knowledge to forecast possibilities and generate new ideas, products or processes.
- [ ] B. Create original works as a means of personal or group expression.
- [ ] C. Develop or apply models and simulations to explore complex systems, issues and trends.
- [ ] Not observed.

Students use digital media and environments to communicate and work collaboratively, across the global community, to support individual learning and contribute to the learning of others.
(check any/all that apply)

- [ ] A. Interact and collaborate with peers, experts, or others employing a variety of digital environments and media.
- [ ] B. Effectively communicate and publish to multiple audiences using a variety of media and formats.
- [ ] C. Engage with learners from other cultures to develop cultural understanding and global awareness.
- [ ] D. Contribute to project teams. Produce original works or solve problems in a team setting.
- [ ] Not observed.

Students select and apply digital tools to gather, evaluate, validate, and use information.
(check any/all that apply)

- [ ] A. Plan strategies to guide inquiry.

- [ ] B. Locate, organize and use information ethically from a variety of sources and media.
- [ ] C. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
- [ ] D. Analyze, evaluate, and summarize information or data and report results.
- [ ] Not observed.

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
(check any/all that apply)

- [ ] A. Identify and define authentic problems and significant questions for investigation.
- [ ] B. Plan and manage activities to develop a solution or complete a project.
- [ ] C. Collect and analyze data to identify solutions and or make informed decisions.
- [ ] D. Use multiple processes and diverse perspectives to explore alternative solutions.
- [ ] Not observed.

Students understand issues related to digital technology and practice legal, ethical, and responsible behavior.
(check any/all that apply)

- [ ] A. Advocate and practice safe, legal, and responsible use of information and digital technology.
- [ ] B. Model and practice a positive attitude toward using digital technology that supports collaboration, learning, and productivity.
- [ ] C. Demonstrate personal responsibility for lifelong learning.
- [ ] Not observed.

Students utilize technology concepts and tools to learn.
(check any/all that apply)

- [ ] A. Select, use, and troubleshoot tools efficiently.
- [ ] B. Transfer current knowledge to learning of new technologies.
- [ ] Not observed.

Evidence of Student and Teacher Usage/Workflow when evidence is observed

Is there evidence the teacher provides feedback/communicates with students digitally (in legal compliance)? *

- ( ) Yes
- ( ) No

Is there evidence that students engage in the content through technology? *

- ( ) Yes
- ( ) No

There is evidence that the following is used in the classroom by teachers.

(check all that apply)

- [ ] Projector
- [ ] Student computers (Dell Venue Pro 10)
- [ ] Mobile Devices
- [ ] Teacher computer (Surface Pro 3)
- [ ] Schoology
- [ ] Student use of active stylus
- [ ] OneDrive (Cloud Storage)
- [ ] Online Video Lessons (Khan Academy, Discovery Ed, Teachertube, etc.)
- [ ] Excel
- [ ] Word
- [ ] OneNote
- [ ] Surveying/Polling Apps and Websites (Socrative, etc.)
- [ ] Online/Digital Collaboration
- [ ] Other: _____

There is evidence that the following is used in the classroom by students.
(check all that apply)

- [ ] Projector
- [ ] Student computers (Dell Venue Pro 10)
- [ ] Mobile Devices
- [ ] Schoology
- [ ] Student use of active stylus
- [ ] OneDrive (Cloud Storage)
- [ ] Online Video Lessons (Khan Academy, Discovery Ed, Teachertube, etc.)
- [ ] Excel
- [ ] Word
- [ ] OneNote
- [ ] Surveying/Polling Apps and Websites (Socrative, etc.)
- [ ] Online/Digital Collaboration
- [ ] Other: _____

Submit

100%: You made it.

Never submit passwords through Google Forms.

2016 ELPA21 Proficiency Descriptors

Emerging

- ELPA21 Official Students are Emerging when they have not yet attained a level of English language skill necessary to produce, interpret, and collaborate on grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile of Levels 1 and 2 in all four domains. Students scoring Emerging on ELPA21 are eligible for ongoing program support.

- Oregon "family friendly" version Emerging – A student at the Emerging level does not yet have the ability produce grade-level academic content in the English language. For the ELPA21 annual assessment, this means the student scores either Level 1 or Level 2 in each of the four domains of reading, writing, listening, and speaking.

Progressing

- ELPA21 Official Students are Progressing when, with support, they approach a level of English language skill necessary to produce, interpret, and collaborate, on grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile with one or more domain scores above Level 2 that does not meet the requirements to be Proficient. Students scoring Progressing on ELPA21 are eligible for ongoing program support.

- Oregon "family friendly" version Progressing – A student at the Progressing level is approaching the ability produce grade-level academic content in the English language with support. For the ELPA21 annual assessment, this means the student scores above a Level 2 on one or more domains, but does not yet meet the requirements to be at the Proficient level on the four domains of reading, writing, listening, and speaking.

Proficient

- ELPA21 Official Students are Proficient when they attain a level of English language skill necessary to independently produce, interpret, collaborate on, and succeed in grade-level content-related academic tasks in English. This is indicated on ELPA21 by attaining a profile of Level 4 or higher in all domains. Once Proficient on ELPA21, students can be considered for reclassification.

- Oregon "family friendly" version Proficient – A student at the Proficient level can produce grade-level academic content in the English language. For the ELPA21 annual assessment, this means the student scores either Level 4 or Level 5 on each of the four domains of reading, writing, listening, and speaking.