

**GREENWICH PUBLIC SCHOOLS**

**Greenwich, Connecticut**

**Date of Meeting:** September 10, 2015

**Title of Item:**

Digital Learning Environment Plan Update

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**REQUEST FOR BOARD ACTION OR PRESENTATION OF INFORMATION ITEMS**

         **Action Required**

  X   **Informational Only**

**Submitted By:** Mr. Phil Dunn / Mrs. Nona Ullman

**Position:** Chief Information Officer (CIO) / DLE Project Manager

**I will be present at Board Meeting to explain if called upon:**

  X   **YES**

         **NO**

**Synopsis of Proposal: Update on the progress of the Digital Learning Environment (DLE)**

**Recommended Action (if appropriate):**

**GPS Board Report:  
Digital Learning Environment**

**DRAFT**

September 10, 2015

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List of Exhibits – Within Board Documents on the Web

1. Year 2 DLE Project Milestones
2. DLE Shifts in Practice by DLE Goal
3. Year 3 DLE Project Milestones
4. Getting Started with the DLE
5. Governance Committee Members for SY2014-15
6. Quality Feedback and Google Docs Study
7. Elementary Teacher Technology Readiness Survey
8. Examples of Student Work
9. DLE Program of Studies, 2015-16
10. Grades 3-6 Student Technology Readiness Surveys

Web-Available Exhibits for Parents: (<http://www.greenwickschools.org/page.cfm?p=11516>)

- o Digital Toolbox Implementation Guide: iPad
- o Digital Toolbox Implementation Guide: Chromebook (Middle School)
- o Digital Toolbox Implementation Guide: Chromebook (High School)

## Executive Summary

As of June 30, 2015, the Greenwich Public Schools (GPS) completed the second year of the three-year, three-phase Digital Learning Environment (DLE) initiative to advance the transformation of teaching and learning in order to accelerate the academic achievement and personal well-being of all students.

This report includes the program evaluation for Year 2 of the DLE (Phase II), including major accomplishments, lessons learned and recommendations for Phase III.<sup>1</sup>

Our approach for program evaluation included answering three primary questions, as shown in the table below:

Evaluation Question	Status	Major Accomplishments
1. Was the DLE Project Plan implemented with fidelity?	Yes	<ul style="list-style-type: none"> <li>Phase II of the DLE was implemented on-time and under budget (see Exhibit 1: Year 2 DLE Project Milestones)</li> <li>A sound infrastructure and device management plan were maintained to ensure sufficient network capacity and safe internet searching</li> </ul>
2. Were teachers able to achieve shifts in their practice in Year 2 (see Exhibit 2 for description of expected shifts in practice) to achieve the DLE goals?	Phase I schools: No  Phase II schools: Yes for 3 of 4 goal areas	<ul style="list-style-type: none"> <li>Phase I schools, for their second year of implementation, reported an average 4 percentage point increase in their achievement of the goal of self-regulated learning, but an average decrease of 11 in achievement of the other goal areas (no statistically significant changes up or down)</li> <li>Phase II schools in the first year of implementation reported an average 5 percentage point increase in achievement of all goal areas but self-regulated learning, where there was an average 9 percentage point decrease</li> </ul>
3. Were there any changes in student outcomes associated with the DLE?	Preliminary	It is still too early to expect changes in student outcomes; as such, there were no DLE studies that analyzed a change in student outcomes for SY2014-15. However, a systemic District-level analysis of student outcomes will be devised in partnership with ECRA, and an in-depth assessment of student outcomes in math for grade 4 is planned for SY2015-16.

<sup>1</sup> The DLE Phases I, II and III occur respectively during Years 1 (2013-14), 2 (2014-15) and 3 (2015-16).

The phased implementation approach of the DLE has enabled early identification of successful DLE components and opportunities for improvement. The Phase II program evaluation has identified the following opportunities for improvement:

- Refocus and align professional learning for Phase III with curriculum and DLE goals
- Increase the role of principal and instructional leaders to provide support and development to help teachers shift their practices
- Enhance DLE communications
- Improve the school-based technical and instructional support model
- Develop internal capacity for program evaluation
- Better understand which components of the DLE lead to improved student outcomes

Each section of this report includes Year 3 objectives based on lessons learned in Phase II. These objectives will be achieved through implementation of the DLE Year 3 Project Plan. A high level calendar of milestones for Phase III is provided in Exhibit 3.

## DLE Overview

The DLE is designed to help students accelerate their achievement by providing teachers with the resources necessary to both differentiate instruction according to the needs of each student, and for students to personalize their own learning, making choices about how they learn and present their new knowledge. The four educational goals of the DLE are:

1. Students will demonstrate critical thinking of online content
2. Students as self-regulators of their learning
3. Students will receive quality feedback on their work
4. Learning will be more personalized for students

The DLE also serves as a catalyst for embracing the Connecticut Core standards and the District Strategic Plan, and helps prepare students to be successful on the new Smarter Balanced Assessments (SBA).

## DLE Components

The DLE is divided into the following component areas:

- Digital Instructional Resources
- Learning Management System (LMS)/Schoology
- Supporting Change of Practice/Professional Learning (PL)
- Planning, Project Management (PPM) and Program Evaluation
- Hardware Leasing
- Infrastructural Improvements
- Communications

The table on the next page summarizes the accomplishments for each DLE component and metrics used in the program evaluation to measure success.

## Accomplishments Year 2 of the DLE

<b>DLE Component</b>	<b>Accomplishments</b>	<b>Representative Metrics</b>
<b>Digital Instructional Resources</b>	<ul style="list-style-type: none"><li>• Defined Digital Toolboxes, (a standard set of applications for use in the classroom) for devices for Phase III schools (see Web Exhibits)</li><li>• Completed initial alignment of digital instructional resources to content identified in the Curriculum Maps K-12</li><li>• Developed and taught a six week Digital Citizenship course (by Library Media Services, LMS) for all Phase II students to ensure safe device and internet use before taking the devices home</li></ul>	<ul style="list-style-type: none"><li>• Published three DLE Implementation Guides with instructions on the care and usage of devices and apps for elementary, middle and high school levels</li></ul>

DLE Work Stream	Accomplishments	Representative Metrics
<p><b>Learning Management System (LMS)</b></p>	<ul style="list-style-type: none"> <li>• Developed an approach to organize and share the GPS curriculum in Schoology with district administrators, educators, and the Board of Education</li> <li>• All district teachers were trained in the use of Schoology</li> <li>• Program Coordinators facilitated collaboration with teacher teams through program groups (Humanities, STEM, World Language, Media, ELL, PE, Music, Art)</li> </ul>	<ul style="list-style-type: none"> <li>• Over 300 units of study have been mapped in Aspen and made available to teachers through Schoology</li> <li>• Six hours of Schoology professional learning were provided to all teachers K-12 in SY2015-16</li> <li>• 92% of all GPS teachers logged into Schoology during SY2014-15, with 38% of all users (including students and administrators) participating in an online discussion and 39% of all users submitting an assignment.</li> <li>• A high percentage of teachers report sharing of work samples online at the end of Year 2 with 91% and 92% at Hamilton Ave and Riverside respectively, and 90%, 85%, and 88% respectively at Central, Eastern and Western Middle Schools<sup>2</sup></li> <li>• Over 900 teachers were added to a shared Schoology group containing the district curriculum and an organized structure to share resources. Teachers were trained to access the curriculum and shared groups</li> </ul>

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<sup>2</sup> Percentages recalculated based on only respondents who responded to all three surveys (Baseline 2014, End-of-Year 2014, and End-of-Year 2015).

DLE Work Stream	Accomplishments	Representative Metrics
<p><b>Supporting Change in Practice/Professional Learning</b></p>	<ul style="list-style-type: none"> <li>• Reorganized the Library Media Services Program to support the implementation of the DLE, i.e., developing sustainable model of building-based support and professional learning</li> <li>• Collaboratively created “Getting Started with the DLE”, a document articulating expected practices that incorporated feedback from every District and school leader<sup>3</sup></li> <li>• Issued and analyzed baseline and end of year teacher surveys for Phase I and II schools and baseline data for Phase III schools</li> <li>• Issued and analyzed data for student technology readiness surveys for grades 3-6</li> <li>• A Phase III professional learning plan has been completed</li> </ul>	<ul style="list-style-type: none"> <li>• Delivered an average of 16 hours of DLE professional learning per teacher for all elementary schools in preparation for Phase III and 42 hours per teacher for Phase II schools</li> <li>• Self-reported data from the Teacher Technology Readiness Surveys (see Supporting Change in Practice section) show: <ul style="list-style-type: none"> <li>• Phase I schools for their second year of implementation reported an average 4% percentage point increase in their performance of the goal of self-regulated learning, but an average decrease of 11% in performance of the other goal areas</li> <li>• Phase II schools in the first year of implementation reported an average 5% percentage point increase in performance of all goal areas but self-regulated learning, where there was an average 9% percentage point decrease</li> </ul> </li> </ul>

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<sup>3</sup> See Exhibit 4

DLE Work Stream	Accomplishments	Representative Metrics
<p><b>Planning, Project Management and Program Evaluation (PPM)</b></p>	<ul style="list-style-type: none"> <li>• Implemented Year 2 DLE Project Plan (Exhibit 1)</li> <li>• Created project plan for Phase III (Exhibit 3)</li> <li>• Key stakeholders participated in DLE governance and management structures</li> <li>• The Phase II program evaluation plan was conducted, providing quantifiable data on DLE progress towards goals as gathered and analyzed in teacher and student surveys, and a study analyzing the impact of Google Docs and Quality Feedback in Writing</li> <li>• A Phase III program evaluation plan has been completed</li> <li>• Studied lessons learned from DLE Years 1 and 2 and best practices in GPS and other districts based on attending industry conferences to inform DLE decisions and reviewed industry reports on digital learning</li> </ul>	<ul style="list-style-type: none"> <li>• Project plan delivered under budget and on-time; most key milestones were achieved on time (see Exhibit 1)</li> <li>• Issued and analyzed Teacher and Student Technology Readiness Surveys for 15 schools across three Phases</li> <li>• Conducted a five month study analyzing essay feedback data from 93 students in four classrooms</li> <li>• Attended four education technology conferences and reviewed best practices with project leadership</li> </ul>
<ul style="list-style-type: none"> <li>• Hardware/Device</li> </ul>	<ul style="list-style-type: none"> <li>• Selected devices for use in Phase II of the DLE through a multi-round rigorous selection process</li> <li>• Devices were tested extensively prior to distribution to ensure applications worked and safe Internet searching was enabled</li> <li>• An external http proxy was placed on each student iPad and Chromebook to provide for safe internet browsing outside of school</li> </ul>	<ul style="list-style-type: none"> <li>• Distributed approximately 300 iPads and 400 Chromebooks to Phase III teachers</li> <li>• Procured, configured and delivered approximately 3,700 iPads and 4,500 Chromebooks to 15 schools for fall distribution to students</li> </ul>

<b>DLE Work Stream</b>	<b>Accomplishments</b>	<b>Representative Metrics</b>
<ul style="list-style-type: none"> <li>Infrastructure and Technical Support</li> </ul>	<ul style="list-style-type: none"> <li>Upgrades to the technology and supporting infrastructure were completed</li> <li>Developed and implemented a DLE support plan for Phase III</li> <li>Infrastructure, the highest risk area at the start of the initiative based on historical problems with speed and capacity, has been improved--increasing network speed and capacity to effectively meet DLE usage demands for the foreseeable future</li> </ul>	<ul style="list-style-type: none"> <li>Installed high speed fiber optic cable connections to each school connecting them to the district uplinks at Havemeyer and GHS</li> <li>Refined the installation of one wireless access point (WAP) for every education space (e.g., classrooms) in the middle schools &amp; GHS</li> <li>Completed the upgrade of all district wireless access points to the high-speed "n" protocol using 5Ghz radios</li> <li>All schools' network switches, routers and servers are operable 99.9% of the time</li> </ul>
<ul style="list-style-type: none"> <li>Communications</li> </ul>	<ul style="list-style-type: none"> <li>DLE communication plan for Phase II and III developed and executed – to include regular written updates, multiple PTAC &amp; parent workshops</li> <li>DLE Frequently Asked Questions (FAQs) updated on the GPS website</li> <li>Ongoing support for the DLE as evidenced by continued funding</li> </ul>	<ul style="list-style-type: none"> <li>DLE press releases/ announcements written immediately following each major DLE milestone</li> <li>3 local media articles written on DLE for SY2014-15</li> <li>Riverside Principal Chris Weiss Twitter feed as of August 2015: 5,800 tweets, 9,000 followers, top recent mention reach 426,000 (August 2014: 1,100 tweets, with top recent reach of 115,000 people)</li> <li>Chris Weiss, Finalist Bammy Awards Innovator of the Year</li> </ul>

## Governance Structure

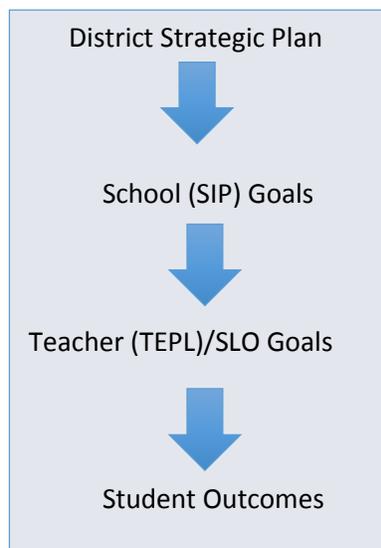
The DLE's governance structure was comprised of three bodies in School Year 2014-15: the DLE Steering Committee (DLE SC), the Digital Learning Advisory Committee (DLAC), and the Executive Technology Advisory Group (E-TAG).

The key contributions of each group are highlighted below. Governance committee membership for SY2014-15 is provided in Exhibit 5.

- DLE SC (held 26 meetings)
  - DLE governance steering committee that made decisions in curricular, professional learning, financial, technical, communications, PPM, and school level operational areas
- DLAC (held 10 meetings)
  - Vetted and recommended devices for Phase III
  - Vetted and recommended applications for the Digital Toolboxes
  - Provided input on the DLE professional learning (PL) program of studies
  - Provided input on supporting policies and procedures
- E-TAG (held 3 meetings)
  - Acted as a sounding board for DLE strategies and work products (e.g., device selection and LMS)
  - Reviewed the District's infrastructure strategies

For School Year 2015-16, the governance structure has been reorganized to ensure alignment of goals, organizational units, and strategies, and to provide a more representative and comprehensive school-based structure as full implementation is reached. District-wide goals can best be achieved if they cascade down throughout the organization starting with the strategic plan as shown in the diagram below.

### Alignment of District Goals



The core organizational functions within GPS, both centrally and at the school level must also be aligned to carry out the Strategic Plan. It is critically important to clarify the importance of and responsibility for aligning curriculum, pedagogy and assessments to achieve goals at both the district and school levels. DLE support (through devices, digital tools and resources) and professional learning are cross-departmental strategies that support and align core organizational functions.

A core organizational change for SY2015-16 is to replace the role of DLAC with School Data Teams to provide a representative and coordinated structure at the school level to monitor progress of the DLE and share best practices. The School Data Teams will provide school-based oversight to plan, implement, review progress and support the success of the Digital Learning Environment (DLE) at each school. These teams will report monthly to district leadership to enable a district-wide view of the DLE implementation.

## Digital Instructional Resources

### Overview

GPS teachers are expected to gradually develop intermediate to advanced proficiency for the DLE Digital Toolbox applications that best support their instructional approach. The DLE Digital Toolbox, documented within the DLE Digital Implementation Guide<sup>4</sup>, is a prioritized list of applications, resources, and textbooks consistently used and supported throughout the district. The DLE Digital Toolbox is organized by grade level (elementary, middle and high school). Each grade level's Digital Implementation Guide also includes instructions on device care, support and liability. DLE Professional Learning opportunities are structured to provide development in the effective delivery of the curriculum by leveraging these tools.

In Phase II, DLE applications were chosen through a structured evaluation process by the Digital Learning Advisory Committee (DLAC) and the Program Coordinators that identified the applications that best supported teaching and learning. Beginning September 2015, the Office of Curriculum, Instruction and Professional Learning (CIPL) will identify digital resources as part of the Curriculum Design Cycle. Additionally, between September and May of any given school year, all teachers may use the DLE App Evaluation Form<sup>5</sup> to recommend digital resources to the Library Media Services Coordinator, for further review by CIPL, on a rolling basis.

### Power Applications

Power Applications were identified for each grade band as those applications most likely to improve teaching and learning. Given limited resources, professional learning is focused on this group of applications (see list below).

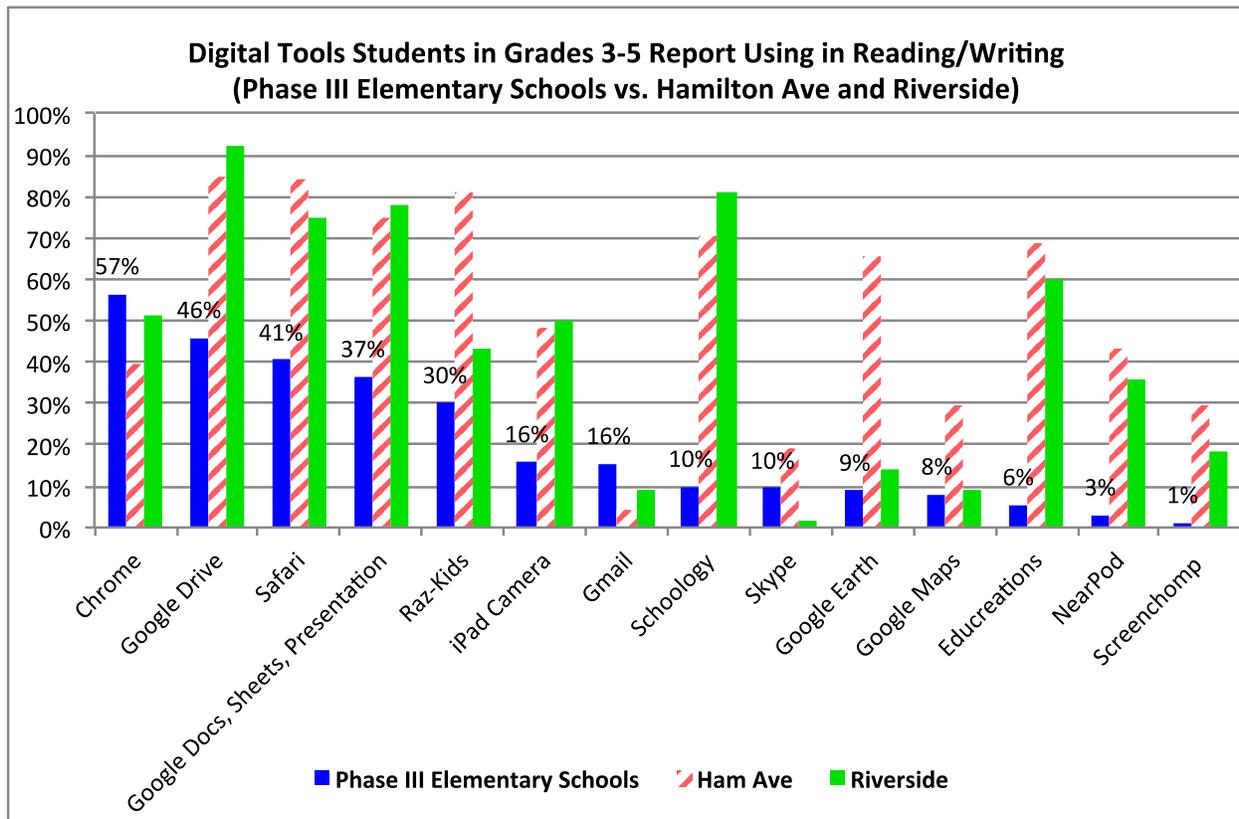
**Year 2 DLE Toolbox Power Applications**

Elementary	Middle	High
Safari/Google Search	Chrome /Google Search	Chrome/Google Search
Schoology	Schoology	Schoology
SMART Notebook	Nearpod	Nearpod
IXL	IXL	Socrative
Khan Academy	Khan Academy	Google Docs
Reading A-Z (K-3)	Newsela (4, 5)	Google Drive
RAZ Kids (K-3)	Google Docs	Google Slides
Newsela (4, 5)	Google Drive	Google Sheets
Google Docs	Google Slides	Google Forms
Google Drive	Google Sheets	Google Hang-Outs
Google Slides	Google Forms	Google Draw
Google Sheets	Screencastify	Google Maps
Google Forms	WeVideo	Google Calendar
Nearpod	Socrative	WeVideo
Skitch	Quizlet	Diigo
Notability	Diigo	Turnitin
Educreations	Turnitin	
iMovie		
Book Creator		
Touchcast		

<sup>4</sup> <http://www.greenwickschools.org/page.cfm?p=11504>

<sup>5</sup> <https://goo.gl/6Wj565>

Students in a 1:1 school (e.g., Phase I students) had access to a greater variety of applications than students without access to a digital device. The graph below shows the percentage of students that had used an application across all elementary schools in Reading/Writing. Hamilton Avenue and Riverside Elementary students have a higher percentage of students reporting they had used these applications.



Source: GPS Student Technology Readiness Surveys, June 2015

### Year 2 Program Evaluation: Teacher Feedback on Student Essays Written with and Without Google Docs

A central question of our program evaluation in Year 2 focused on the impact of a power application, Google Docs, on teaching and learning. We chose to study Google Docs as a Riverside teacher told us that he believed both the quality and quantity of student writing had increased since he started to use Google Docs for writing. The teacher felt that an important function of Google docs that contributed to student performance was his ability to provide more feedback easily, and while the student was writing using the comments function. Exhibit 6 is a study led by Dr. Fiona Hollands of Columbia Teachers College to investigate whether the use of Google Docs for essay assignments would change the amount and nature of written feedback received by 4<sup>th</sup> grade students from their teachers, as compared with students not using Google docs. The study reviewed the amount of feedback given on the Opinion writing unit in February with hand-written comments compared to the amount of feedback given on the Comparative Literary Essay in June using Google Docs for commenting. Overall findings include:

- Students received an average of 42 minutes of verbal and written feedback during their Opinion Writing unit

- A decrease in the amount of feedback given to students was observed with the usage of Google Docs. However, the reason for this is unclear as the integrity of the original study was compromised when the control school dropped out, and the teachers in the treatment school said they purposefully gave less feedback on the Comparative Literary Essay to assess whether students had improved in their ability to revise their work with less feedback.
- Teachers indicated that Google Docs was useful for collaborative writing and providing feedback to students while their work is still in process (formative assessment). One teacher preferred using Schoology to provide feedback as Schoology allowed her to annotate and draw anywhere on student essays and easily attach a rubric and grade student work, whereas Google Docs did not. In Year 3, Schoology will be our recommended Power app for providing summative feedback on student writing, with Google Docs recommended for formative assessment and group writing projects.
- The collection and analysis of teacher feedback indicated a wide range in the quality of feedback provided by teachers and a lack of alignment with the District Teaching Pathways Rubric. This rich data source of teacher feedback will be anonymously used to demonstrate instructional excellence in providing feedback on student writing.
- The review of student peer feedback indicated that students also need training on providing quality feedback. The highest levels of teaching critical thinking require that students are able to ask probing questions and evaluate the quality of their own and peer work.
- The original study included assessing the quality of comments and their impact on the quality of student work. However, the results of this part of the study became compromised with the dropping out of the control school. In September, we plan to further investigate this research question with the available student essays and feedback from Riverside alone.

In Year 3, CIPL will continue to identify the most effective digital resources that support an effective change in teacher practice and rigorous personalized instruction, and standardize practice around these apps. For example, in math, grades K-8, IXL is recommended as a personalized supplementary tool to reinforce specific common-core aligned skill areas up to 20 minutes, three times a week.

### Year 3 Objectives

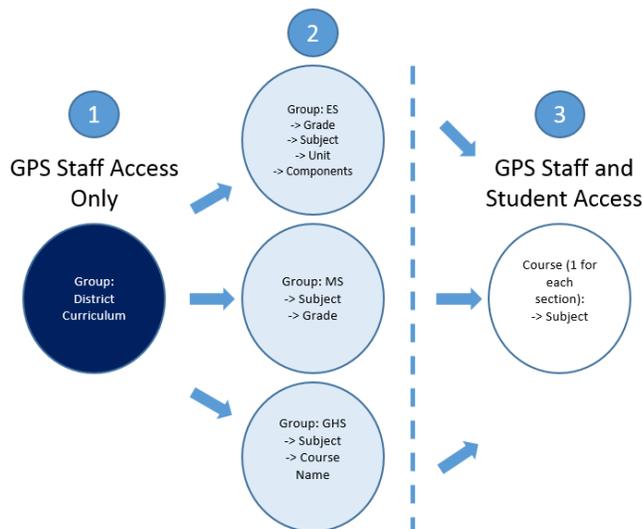
- Continue documentation of district curriculum and identification of digital resources through the curriculum mapping process
- Revise and update the Digital Toolboxes
- Focus on identifying the most effective applications that support a change in teacher practice, rigorous instruction and differentiation, and standardize practice around these apps

# Learning Management System (LMS)

## Overview

A key contribution of the DLE is providing one online destination to access the GPS curriculum. In the past, teachers accessed the curriculum and shared resources on a multitude of Wiki Spaces throughout the district. Year 2 of the DLE has standardized the approach to accessing the curriculum and sharing instructional resources by providing one-stop-shopping through Schoology.

The diagram below shows the knowledge management strategy for accessing the GPS curriculum and enabling organized sharing of instructional resources among teachers district-wide in a Schoology group. The circle to the right of the dotted vertical line shows how the curriculum is delivered in a Schoology Course, which is where students and parents have views into Schoology.



**Overview:** There are 3 entities to support learning in Schoology:

1. A District Curriculum GROUP that is maintained by CIPL, and teachers may access the official District curriculum;
2. There are Groups for each grade level, organized by the different hierarchies displayed in the diagram – only GPS Staff may access these shared instructional resources;
3. Each teacher populates a course for each section taught.

## Curriculum Management

The CIPL Office manages curriculum development, mapping, renewal and continuous improvement. At the close of each school year, vertical or Pk-12 grade level curriculum cadres meet to analyze the curriculum. Based upon their findings, they determine curriculum goals, specific entry points for renewal, and guide program/CIPL development plans. The evaluation of curriculum is a continuous process, where written curriculum is assessed and examined to determine what needs improvement, alignment or balancing.

Curriculum mapping is the systematic process of documenting and inventorying existing GPS curriculum materials and instructional resources, including digital resources, and aligning them to the state and national standards. In Phase II of the DLE, the District implemented a process whereby curriculum materials were mapped in Aspen, and a file of each subject and grade level curriculum map was uploaded to the District Curriculum Group in Schoology for all teachers to access and import into their Schoology Courses.

Over 300 units of study have been mapped in Aspen PK-12 in all content areas. Core academic curriculum maps are documented in Aspen for Pre-kindergarten Language and Literacy, K-12 Mathematics, English Language Arts, Science, Music, Art, Physical Education, Health and Digital Literacy (Library Media).

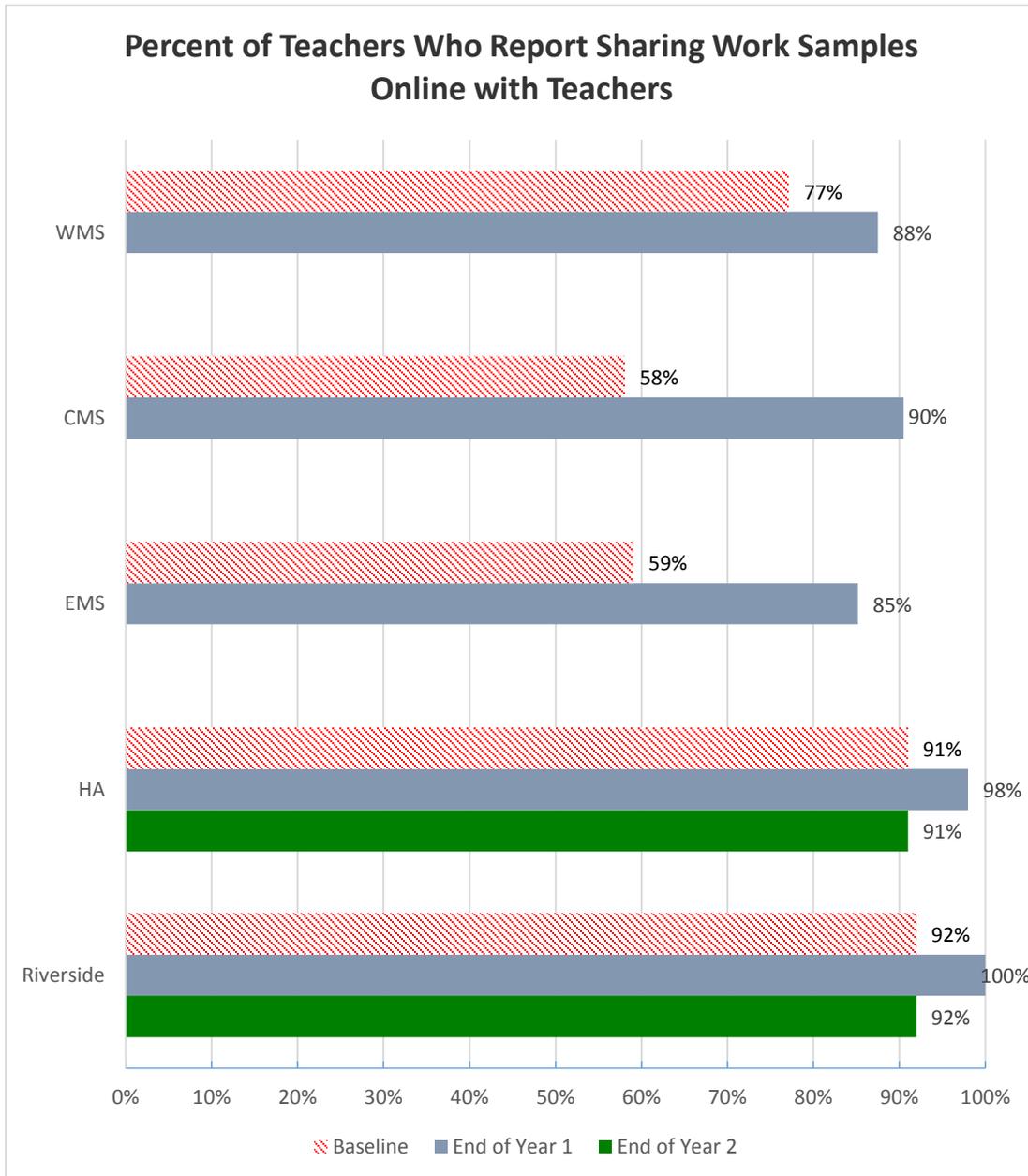
Curriculum mapping will be completed for remaining core subjects for all grades by the end of school year 2015-16.

#### Schoology, the GPS Learning Management System

As reported in the August 28, 2014 Report to the BOE, the implementation of Schoology is providing the following benefits to teachers and students:

- Teachers create a digital classroom in Schoology where they can save, organize, share and easily present standards-based instructional digital resources
- Schoology provides the structure for sharing of instructional resources within professional communities of practice (i.e., using the shared curriculum folders noted above)
- Homework will be posted in Schoology for students in grades 6-12 for SY2015-16
- Use of threaded discussions to create a classroom community around inquiry questions, provides more opportunities for all students to participate in guided class discussions
- Provision of online formative assessments enable the automatic grading of student quizzes, providing immediate and embedded feedback and differentiation of instruction and reducing administrative time taken to grade papers

As shown in the graph below, there were significant increases in the sharing of online work since Year 1 of the DLE. At the end of Year 2 of the DLE a high percentage of teachers reported sharing of work samples online with 91% and 92% at Hamilton Ave and Riverside respectively, and 90%, 85%, and 88% respectively at Central, Eastern and Western Middle Schools, with the largest increase in the combined use of Schoology and Google Drive<sup>6</sup>



<sup>6</sup> Percentages recalculated based on only respondents who responded to all three surveys (Baseline 2014, End-of-Year 2014, and End-of-Year 2015).

Common tasks performed in Schoology include setting up threaded discussions, joining groups to share instructional materials and issuing and submitting student assignments. The chart below shows the percentage of total users at all schools that have participated in these Schoology tasks in SY2014-15. Overall, during SY2014-15, 92% of teachers have logged into Schoology at least once, with an average of 48% of all users (including students and administrators) logging into Schoology. Usage of Schoology is substantially higher at Phase I and II schools, Greenwich High School, Parkway and Glenville Elementary Schools.

**Percent of Total Users Logging In, Participating in Discussions and Completing Assignments**

**School Year 2014-15**

		<b>Log-ins</b>	<b>Discussions</b>	<b>Assignments</b>
	CC	8%	7%	5%
	OG	9%	7%	5%
	NM	9%	6%	6%
	NS	15%	9%	6%
	NL	21%	8%	7%
	ISD	24%	17%	15%
	JC	29%	6%	10%
	GLV	37%	35%	20%
	AHSP	50%	18%	27%
Phase I Schools	HA	55%	38%	44%
	RV	64%	48%	46%
	PKW	68%	67%	64%
	GHS	95%	79%	93%
Phase II Schools	WMS	97%	93%	94%
	EMS	97%	76%	85%
	CMS	98%	93%	96%

While a majority of users have logged in and participated in threaded discussions and submitted online assignments, the use of Schoology is not yet fully integrated into daily use. As expected, schools with a higher ratio of devices to students have a higher daily use of Schoology. The use of Schoology is highest at Greenwich High School and the Phase I and Phase II schools and Parkway Elementary School, with an average of 17% of all users (students, teachers, and administrators) logging into Schoology each day at the middle and high schools and an average of 6% of users at the Phase I schools and Parkway.

**Average School Unique Users Per Day SY2014-15**

<b>Average Daily Users</b>	<b>As of % of Users</b>	<b>School</b>
3	1%	North Street School
1	1%	Alternative High School Programs
4	1%	Old Greenwich School
6	1%	North Mianus School
4	1%	New Lebanon School
6	1%	Julian Curtiss School
7	1%	Cos Cob School
8	2%	Glenville School
10	2%	International School at Dundee
21	4%	Hamilton Avenue School
16	6%	Parkway School
39	7%	Riverside School
209	14%	Eastern Middle School
174	16%	Western Middle School
805	17%	Greenwich High School
241	21%	Central Middle School

**Year 3 Objectives**

- Provide professional learning to teachers to access the curriculum, as described above
- Encourage teachers to populate Schoology with instructional materials (e.g., lesson plans) that may be shared with their colleagues
- Establish communities of practice that allow teachers of a common subject or grade level to share resources
- Continue to identify and study instructional best practices using Schoology

## Supporting Change of Practice

### Overview

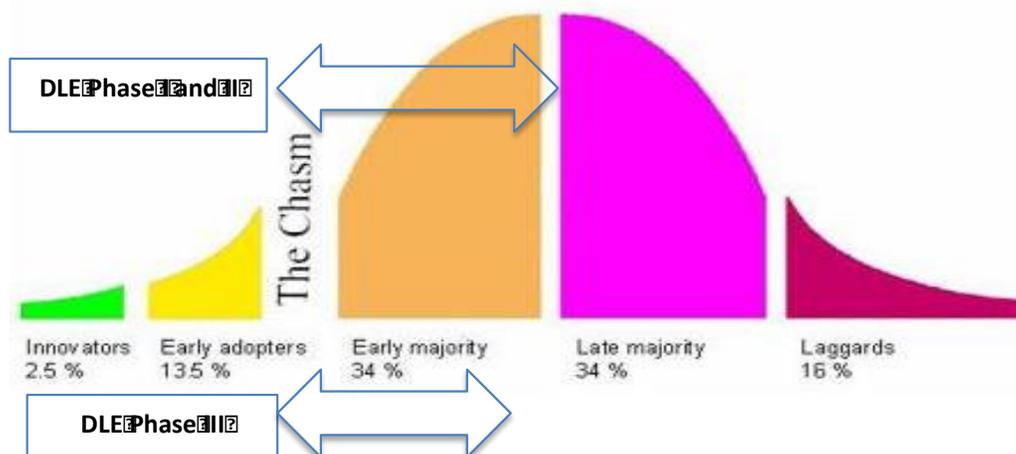
Changing professional practice to align with the DLE educational goals is the hardest part of implementing the DLE. By the end of Year 1 of the DLE implementation, 20-30% of Phase I school teachers had started incorporating DLE goals into their regular practice based on their self-reported responses to the Teacher Technology Readiness Survey (Exhibit 7). It was expected that in Year 2 a new group of approximately 20-30% of Phase I teachers would shift their practice. This did not occur. In fact, there was no statistically significant shift in practice for Phase I teachers in any goal area in Year 2. We believe this was due to the difficulty in getting new technology practices to spread beyond the “Innovators” and “Early Adopters,” an industry standard phenomenon represented in the graphic below by the “Chasm.”

Phase II teachers did have statistically significant shifts in practice in their first year of the DLE implementation. The Phase III teachers reported that their “Innovators” and “Early Adopters” are already performing some of these goals at their baseline measurement in June 2015.

Shifts in practice were expected to align with Roger’s Innovation Adoption Curve<sup>7</sup> (shown below), which shows that organizational stakeholders change their practice in groups over time, with the first 2.5% of teachers who are ready to incorporate new practices considered Innovators, the next 13.5% to change considered “Early Adopters,” followed by the “Early Majority” (34%), “Late Majority” (34%) and “Laggards” (16%).

As of June 2015 (End of Year 2 of DLE Implementation)

### Roger’s Innovation Adoption Curve



<sup>7</sup> "Diffusion of Innovations," Rogers and Everett, 1962.

On average, by the end of the second year of implementation, Phase I elementary schools had between 23% and 52%, and Phase II 6<sup>th</sup> grade middle school teachers had between 13% and 56%, of teachers report that they regularly incorporated the DLE goals into their practice (see chart below). Personalization of learning had the highest percentage of teachers performing this goal with 52% of Phase I teachers and 56% of Phase II teachers self-reporting that they perform the sub goals regularly (i.e., once a day or at least once a week).

**Phase I and II Teachers Self-Reported Performance of DLE Goals**

<b>DLE Goals</b>	<b>Phase I (as of June 30, 2015)</b>	<b>Phase II (as of June 30, 2015)</b>
Critical Thinking of Online Content	23%	30%
Self-Regulated Learning	24%	13%
Quality Feedback	33%	36%
Personalization of Learning	52%	56%

Phase III teachers, as shown in the table below, are also in the Early Majority stage based on their baseline survey responses in April of 2015 with 15% - 47% of Phase III elementary teachers, 18% - 50% of 7<sup>th</sup> and 8<sup>th</sup> grade teachers, and 20% – 49% of high school teachers self-reporting they regularly perform the DLE goals on average.

**Phase III Teachers Self-Reported Performance of DLE Goals**

<b>DLE Goals</b>	<b>Phase III (Elem) All but HA &amp; RV April 2015</b>	<b>Phase III (MS) 7<sup>th</sup> and 8<sup>th</sup> gr April 2015</b>	<b>Phase III (HS) April 2015</b>
Critical Thinking of Online Content	21%	33%	37%
Self-Regulated Learning	15%	18%	20%
Quality Feedback	30%	41%	37%
Personalization of Learning	47%	50%	49%

As shown in the table below, few additional Phase I and II teachers shifted their practice during school year 2014-15.

<b>DLE Goals</b>	<b>Phase I Schools Change from June 2014 to June 2015</b>	<b>Phase II Schools Change from April 2014 to June 2015</b>
Critical Thinking of Online Content	-16%	7%
Self-Regulated Learning	4%	-9%
Quality Feedback	-6%	5%
Personalization of Learning	-13%	3%

Overall, we have found that in implementing the DLE, teachers reported positive shifts in practice to achieve the DLE goals in Year One, with a regression towards the baseline in Year Two.

### Example Best Practices – DLE Goals

There have been many exciting and outstanding examples of shifts in practice throughout the district that demonstrate the achievement of DLE goals and sub-goals. The table below provides examples of how the DLE is supporting shifts in practice to positively impact student outcomes. The Phase I schools (Riverside and Hamilton Avenue) and Phase II schools (all three middle schools) had statistically significant shifts in practice in the sub-goals listed below in their first year of implementation.

<b>DLE Goal</b>	<b>Sub-Goal(s) with Statistically Significant Shift(s) In Practice</b>	<b>Sample Student Work (Exhibit 8)</b>	<b>Digital Tools</b>
<b>Critical Thinking of Online Content</b>	<p><b>Communicate Information:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Communicate information to specific audiences in an effective and coherent manner</li> <li><input type="checkbox"/> Use multiple means of representation such as audio, video, image and text</li> </ul>	<p><b>Riverside 4th Grade Social Responsibility Unit</b></p> <p>Students created a one minute public service announcement (PSA) to convince viewers to ban smoking at Greenwich public beaches. Students researched oceanography using quality online resources from subscription databases, discovery video, selected print and eBooks. Students wrote their using Google Docs collaboratively - getting feedback from teachers and peers. Students communicated</p>	<p><b><u>iMovie, Touchcast, Podcasts, Sketchpad, Pixlr</u></b></p> <p>The use of digital tools increases the cognitive complexity of expression by adding choice of multiple variables to express thought including, color, movement, sound, pictures, and font/typeface</p>

		<p>their findings by choosing the best medium for the message, in this case, synthesizing information into a multimedia, persuasive video.</p> <ul style="list-style-type: none"> <li>• <a href="http://bit.ly/18N8rax">http://bit.ly/18N8rax</a></li> </ul>	
<p><b>Critical Thinking of Online Content</b></p>	<p><b>Locate Information:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Locate a variety of online sources to help solve a real world problem</li> </ul> <p><b>Evaluate Information:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Find and evaluate online content to answer empirical questions</li> </ul>		<p><b>Locate information:</b></p> <p>Students are taught to think critically about how to find information online through <b><u>Google Chrome, Safari, and subscription databases</u></b> and evaluate bias and reliability of source data.</p> <p><b>Evaluate information:</b></p> <p>Students use digital applications to better organize and evaluate data used to answer questions such as <b><u>Padlet, Diigo, My Brain Pop and Lucid Chart.</u></b> Students use <b><u>Turnitin</u></b> to evaluate their own work for originality.</p>
<p><b>Self-Regulated Learning</b></p>	<p><b>Students create and store their work in a digital portfolio</b></p>	<p>Students save, organize and share their work online in digital portfolios (see link below) using tools such as, Google Drive and Schoology. Online portfolios reduce the loss of work, improve organization, enable long-term storage and faster retrieval of work, and enable students and teachers to easily collaborate and see growth in student work products (See Exhibit 8).</p>	<p>Using <b><u>Google Drive</u></b> and <b><u>Schoology</u></b> students can easily share their work in multiple formats (e.g., <b><u>Google Docs, Google Sheets, PDF, movie and photo file formats</u></b>) with multiple audiences.</p>

<b>Quality Feedback</b>	Teachers use digital resources to embed feedback in student work that is still in process (e.g., Google Docs, Schoology)	Teachers embed feedback in student work, enabling an ongoing record of feedback and allowing immediacy of teacher input while work is still in progress.	Using <u>Google Drive</u> and <u>Schoology</u> teachers and students can embed feedback directly into student work, reducing paper shuffling and providing a record of prior feedback. <u>Schoology</u> enables faster grading of student work by allowing easy attachment and completion of rubrics, as well as providing recorded verbal feedback.
<b>Personalization of Learning</b>	Technology is used to automate provision and tracking of individualized learning plans	Common Core aligned personalized adaptive learning platforms provide teachers with data/reports on personalized mastery of skills at a student’s own pace and level.  Exhibit 8 shows the use of IXL, a personalized learning platform recommended for supplementary use to teach math three times a week for 20 minutes per session.	<u>IXL</u> and <u>Newsela</u> are digital tools which enable students to move at their own pace and skill level. <u>Online leveled book libraries</u> such as <u>Follett Bookshelf</u> , <u>Overdrive</u> and <u>Big Universe</u> enable students to easily find and download books that match their interests at their “just right” reading level.

Links to additional best practices have been documented in videos on the GPS DLE webpage (<http://www.greenwickschools.org/page.cfm?p=11502>).

## Statistically Significant Changes in Practice

GPS had statistically significant progress in the following sub-goals:

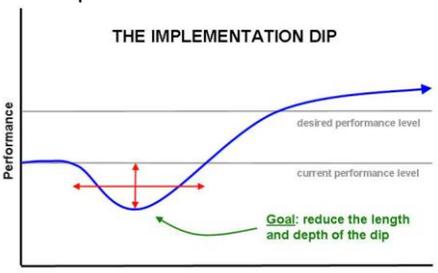
### Sub-Goals with Statistically Significant Shifts in Practice

Phase I Schools in Year 1	Phase II Schools in Year 2
<p><b>Hamilton Avenue (K-5)</b></p> <ul style="list-style-type: none"> <li>• Critical Thinking of Online Content               <ul style="list-style-type: none"> <li>○ Locate Information</li> <li>○ Synthesize Information</li> <li>○ Communicate Information</li> </ul> </li> <li>• Self-Regulated Learning               <ul style="list-style-type: none"> <li>○ Students create and store their work in a digital portfolio</li> </ul> </li> <li>• Quality Feedback               <ul style="list-style-type: none"> <li>○ Students have an opportunity to publish their work for peer reflection and support</li> </ul> </li> <li>• Personalized Learning               <ul style="list-style-type: none"> <li>○ Instruction is responsive to students' choice and interests</li> <li>○ Students are able to work at their own pace to master skills and knowledge</li> </ul> </li> </ul>	<p><b>Central Middle School (6<sup>th</sup> grade)</b></p> <ul style="list-style-type: none"> <li>• Provide quality feedback               <ul style="list-style-type: none"> <li>○ Teachers use digital resources to embed feedback in student work that is still in process (e.g., Google Docs, Schoology)</li> </ul> </li> </ul> <p><b>Eastern Middle School (6<sup>th</sup> grade)</b></p> <ul style="list-style-type: none"> <li>• Personalized learning               <ul style="list-style-type: none"> <li>○ Technology is used to automate provision and tracking of individualized learning plans</li> </ul> </li> </ul>
<p><b>Riverside Elementary (K-5)</b></p> <ul style="list-style-type: none"> <li>• Critical Thinking of Online Content               <ul style="list-style-type: none"> <li>○ Locate</li> <li>○ Communicate Information</li> </ul> </li> <li>• Self-Regulated Learning               <ul style="list-style-type: none"> <li>○ Students create and store their work in a digital portfolio</li> </ul> </li> <li>• Provide quality feedback               <ul style="list-style-type: none"> <li>○ Teachers use digital resources to embed feedback in student work that is still in process (e.g., Google Docs, Schoology)</li> <li>○ Students have an opportunity to publish their work for peer reflection and support</li> <li>○ Students have an opportunity to receive feedback on independent work teacher-to-student</li> </ul> </li> <li>• Personalized Learning               <ul style="list-style-type: none"> <li>○ Instruction is responsive to students' choice and interests</li> <li>○ Students are able to work at their own pace to master skills and knowledge</li> </ul> </li> </ul>	<p><b>Western Middle School (6<sup>th</sup> grade)</b></p> <ul style="list-style-type: none"> <li>• Critical Thinking of Online Content               <ul style="list-style-type: none"> <li>○ Locate Information</li> <li>○ Evaluate Information</li> </ul> </li> <li>• Providing Quality Feedback               <ul style="list-style-type: none"> <li>○ Teachers use digital resources to embed feedback in student work that is still in process (e.g., Google Docs, Schoology)</li> <li>○ Students receive feedback on independent work teacher-to-student</li> </ul> </li> </ul>

## Change Management Approach

The table below describes our top four theories for slower than expected shifts in teacher practice (i.e., trying to “bridge the chasm”) and how we plan to adjust our strategy to both adjust our expectations, and increase the rate and effectiveness of teacher shifts in practice.

### Theories and Strategies for “Bridging the Chasm” of Expected Shifts in Teacher Practice

Theory	Description	Strategy Adjustment
<p><b>Overly Ambitious Scope and Timeframe</b></p>	<p>In addition to learning the new Connecticut Core Standards, SBA and STAR assessments, teachers are also learning to leverage the DLE to achieve these standards. The DLE is structured around the achievement of four educational goals with 22 embedded sub-goals. Each goal requires changes in routine and methods, as well as learning new digital tools. The Digital Implementation Guides list Power Applications for each grade band that have been prioritized for professional learning based on their demonstrated positive impact on teaching and learning in the classroom. There are 22, 17 and 16 Power Applications listed for elementary, middle and high school teachers respectively. Each application can take from one (e.g., Google docs) to six hours (e.g., Schoology) to learn how to use and successfully incorporate into the classroom.</p>	<p>The organization will focus on leveraging the DLE as an overarching strategy to personalize learning, and all organizational activities will align with this strategy.</p> <p>DLE implementation adjustments include publishing the “Getting Started with the DLE” document (Exhibit 4) which prioritizes and focuses expected shifts in practice in year one of DLE implementation.</p>
<p><b>Implementation Dip</b></p>	<p>Decreased results may be due to a standard change phenomenon called the “Implementation Dip” as shown in the diagram below.<sup>8</sup> The Implementation Dip posits that with any new change in practice, learning how to incorporate a change in practice results in a dip or decrease in performance until the new technique is mastered.</p> 	<p>No adjustment needed; once the new practice is mastered, performance will rise above the previous level of performance.</p>

<sup>8</sup> Implementation Dip, Scott McLeod, July 23, 2007 - <http://bigthink.com/ideas/implementation-dip>

Reason	Description	Strategy Adjustment
<p><b>Lack of Sufficient, Aligned and Personalized Professional Learning</b></p>	<p>We had planned to deliver 39 hours of professional learning in Year 1 to Phase I schools, but were only able to deliver 20 hours. In Year 2, we provided an additional 15 hours of district-wide DLE professional learning (PL) to Phase I and Phase III schools and 42 total hours of DLE PL to Phase II schools (including the 15 hours of DLE district-wide PL). 12 hours of the 15 hours of district-wide professional learning provided were device or application focused and were generally neither personalized/differentiated, nor included vivid examples of instructional excellence, strong linkages to the curriculum or student outcomes.</p> <p>In addition, while we had planned to roll out an Early Adopter program where the Innovators and Early Adopters would continue to design and share DLE instructional best practices with the other teachers, this program was not effectively implemented.</p> <p>Desired student outcomes have not yet been clearly defined and aligned across the SBA, STAR or classroom formative assessments,</p>	<p>Our school year 2015-16 DLE Program of Studies (Exhibit 9) provides 27 hours of district-wide PL that is personalized to each teacher, curriculum-based, and includes a focus on improving pedagogy and student outcomes. DLE checklists will be created to clearly communicate how to translate the DLE vision and goals into classroom practice.</p> <p>A DLE Professional Learning Needs Assessment to be completed by each teacher will personalize and prioritize DLE professional learning goals and request a focus on lasting improvements in pedagogy and student outcomes that align with each teacher’s TEPL goals. The Leadership Council and School Data Teams will review the findings from the DLE Professional Learning Needs Assessment and ensure each teacher is receiving personalized PL on an ongoing basis.</p> <p>A cadre of Early Adopters, or as referred to in Greenwich Public Schools, Learning Facilitators, will receive additional PL, help deliver DLE PL, and be available for school-based classroom visits for teachers to observe DLE best practices.</p> <p>Program evaluation for SY2015-16 includes a study on documenting and developing professional learning on highly effective strategies for teaching reading.</p> <p>CIPL is leading the work to align student outcomes across district assessments to ensure student</p>

	<p>limiting the ability of teachers to predict and potentially improve student success on benchmark (STAR English Language Arts and math) and summative tests (SBA).</p>	<p>growth is defined and measured the same across formative, benchmark and summative tests, providing teachers and families with frequent actionable data for improvement.</p>
<p><b>School-Based Support and Accountability</b></p>	<p>Principals received little DLE professional learning during the 2014-15 school year. A principal classroom DLE walkthrough was developed, but DLE observations will not commence until SY2015-16.</p> <p>The role of instructional coaches was redesigned from a subject-specific focus to a generalist focus, with expectations for supporting a Digital Learning Environment.</p> <p>While improvements have been made in teacher satisfaction with technical support, significant opportunities remain. Elementary schools have had limited access to on-site DLE coaching and support.</p>	<p>Principals will receive at least 12 hours of dedicated leadership training with additional coaching from November Learning. Principals are expected to conduct DLE classroom walkthroughs, encourage sharing of best practices at faculty meetings, and regularly follow up with teachers to ensure that they are receiving and applying their personalized professional learning plan. Principals are expected to set a tone of high expectations within their schools and create a culture that values risk-taking, innovation and continuous improvement based on student outcomes. Instructional coaches are expected to assist in helping teachers leverage the DLE and achieve shifts in practice.</p> <p>School Data teams will provide school-based oversight to plan, implement, monitor progress and support the success of the DLE at each school.</p> <p>The Library Media Specialists (LMS) have been reorganized to provide local, school-based support. The LMS will receive extensive training to provide a sustainable support structure. The elementary schools have moved from fixed to flexible scheduling to allow LMS to co-plan and co-teach to support implementation of the DLE.</p>

### Year 3 Objectives

- Successfully deliver the DLE Program of Studies in a personalized way that aligns strategic goals, SIP goals, and teacher goals with student outcomes
- Support principals and instructional coaches to follow up with teachers to ensure the PL is being implemented in the classroom as demonstrated by shifts in practice and student work that demonstrates best practices enabled by the DLE (See Supporting Change of Practice section)
- Restart the Early Adopter/Learning Facilitator program to support DLE PL and enable teachers during the school day to observe their peers teaching best practice examples (to “bridge the chasm”)

## Project Planning and Management and Evaluation

### Overview: Project Planning and Management and Evaluation

A strong project management approach provided the foundation for the implementation of the DLE. The DLE Steering Committee continued to provide bi-weekly guidance to the DLE effort and consisted of key decision makers who could provide a cross-functional view of GPS including curriculum, instruction, professional learning, finance, technology, communications, project management, program evaluation and school level operations. The DLE Steering Committee was expanded to align with the network model and include representation from the Phase II and III schools, providing perspectives and input from schools new to the project. The DLE SC met bi-weekly to review progress against the project milestones, review deliverables, monitor risks, and resolve issues. The DLE SC initiated written DLE Updates after each Steering Committee meeting that were distributed to all administrators.

The project management approach included weekly planning and monitoring of the DLE Project Plan, (practical steps required for implementation of the DLE) for each of the core work streams:

- Curriculum and Instruction
- Learning Management System (LMS)
- Supporting Change of Practice/Professional Learning
- Project Management and Program Evaluation
- Technical Infrastructure and Support
- Communications

In addition to the DLE SC, DLAC provided input from a cross-representative group of teachers and E-TAG provided corporate and higher education executive level expertise.

### Overview: Best Practices

Review of Best Practices in Year 2 of the implementation included attendance, note-taking on best practices, and identification of potential DLE professional development professionals at the following conferences:

- University of CT, Storrs, iPad in the Classroom (May 2015)
- ISTE (June 2015)
- November Learning conference (July 2015)
- New York City Department of Education Tech Summit (July 2015)

In addition, an interview on best practices of the High School Chromebook pilot was conducted with lessons learned incorporated into classroom and file management for the August 31, 2015 DLE professional learning day.

## Overview: Program Evaluation

A Phase II program evaluation has been completed, in conjunction with GPS, Improve LLC, and Teachers College, Columbia University, to assess the success of the DLE initiative in school year 2014-15. The program evaluation focused on the following questions:

1. What practical steps were planned in order to implement a Digital Learning Environment in the Greenwich Public Schools and what was the intended impact of each?
2. To what extent has each step been implemented to date?
3. What changes have arisen in the skills and practice of teachers and school administrators, and how is this reflected in student work since the initiation of the DLE?

The practical steps required for implementation of the DLE includes the tasks and timeline articulated within the DLE Project Plan and the core work stream areas of:

- Curriculum and Instruction
- Learning Management System (LMS)
- Communication
- Supporting Change in Practice/Professional Learning
- Technology Infrastructure and Support
- Project Management and Program Evaluation

## Program Evaluation: Progress Against Plan

The table below provides highlights of the extent to which planned tasks and processes were implemented by work stream and lessons learned. Two summary status ratings are used: “Implemented as Planned” or “Partial Implementation.”

Work Stream	Planned Steps Implemented	Lessons Learned
Curriculum and Instruction	<p><b>Status: Implemented as Planned</b></p> <p>Digital Toolboxes require continued analysis and refinement.</p> <p>Curriculum mapping process begun summer 2014.</p>	<p>“Less is more” when identifying Digital Toolbox apps. Prioritized Power Applications for professional learning that best support teaching and learning.</p> <p>Embed app training within specific curricular units and desired shifts in practice (i.e., use Schoology to provide greater quality feedback).</p>
Learning Management System (LMS)/Schoology	<p><b>Status: Implemented as Planned</b></p> <p>Schoology went live district-wide in August, 2014. Six hours of customized GPS training were provided to all GPS teachers.</p>	<p>Schoology is the most important Power Application as it provides each teacher with a digital classroom through which to save, organize, share and deliver online instructional content.</p> <p>Teachers require at least six hours of training to feel comfortable using Schoology in the classroom and need PL time to import curriculum materials into their own courses.</p>
Communication	<p><b>Status: Implemented as Planned</b></p> <ul style="list-style-type: none"> <li>• DLE Phase II communications included student, staff and parent workshops</li> <li>• Internal, written DLE Updates for Administrators initiated</li> <li>• DLE Phase III Communications Plan developed and implemented a full six months earlier than in previous DLE Phases.</li> <li>• DLE Frequently Asked Questions (FAQs) updated and posted to GPS website</li> <li>• Press releases written following major DLE milestones</li> <li>• Twitter feeds expanding</li> </ul>	<p>Continue timely and consistent communication to all stakeholders.</p> <p>Increased use of visual and social media will be a focus for Year 3.</p> <p>Program evaluation results need to be communicated in a way that enables continuous improvement. For example, information about changes in practice will need to be reviewed by the Assistant Superintendent for Curriculum, Instruction and Assessment, while issues related to technology support will need to be addressed by the CIO who oversees the relevant staff.</p>

Work Stream	Planned Steps Implemented	Lessons Learned
Professional Learning (PL)	<p><b>Status: Partial Implementation</b></p> <p>We had planned to deliver 39 hours of professional learning in Year 1 to Phase I schools, but were only able to deliver 20 hours. In Year 2, we provided an additional 15 hours of district-wide DLE professional learning (PL) to Phase I and Phase III schools and 42 total hours of DLE PL to Phase II schools (including the 15 hours of DLE district-wide PL). 12 hours of the 15 hours of district-wide professional learning provided were device or application focused and were generally neither personalized/differentiated, nor included vivid examples of instructional excellence, strong linkages to the curriculum or student outcomes.</p> <p>In addition, while we had planned to roll out an Early Adopter program where the Innovators and Early Adopters would continue to design and share DLE instructional best practices with the other teachers, this program was not effectively implemented.</p>	<p>We redesigned the DLE Program of Studies (POS) to provide 27 hours of district-wide PL that is personalized to each teacher, curriculum-based, and includes a focus on improving pedagogy and student outcomes. The DLE POS also includes additional coaching, self-study, and online opportunities. DLE checklists will be created to clearly communicate how to translate the DLE vision and goals into classroom practice.</p> <p>We realized we need a strong school support and accountability structure to follow up with teachers to ensure PL gets implemented into shifts in practice in the classroom. The principals, instructional coaches and School Data Teams will review the findings from the DLE Professional Learning Needs Assessment and ensure each teacher is receiving personalized PL on an ongoing basis.</p> <p>Principals needed more PL and will receive at least 12 hours of dedicated leadership training with additional coaching from November Learning. Principals are expected to conduct DLE classroom walkthroughs, encourage sharing of best practices at faculty meetings, and regularly follow up with teachers to ensure they are receiving and applying their personalized professional learning plan. Principals are expected to set a tone of high expectations within their schools and create a culture that values risk-taking, innovation and continuous improvement based on student outcomes.</p> <p>The Early Adopters/Learning Facilitators program needs to be implemented in Year 3 of the DLE, including modeling effective use of the DLE and assisting in district-wide PL.</p>

Work Stream	Planned Steps Implemented	Lessons Learned
Technical Infrastructure and Support	<p><b>Status: Implemented as Planned</b></p> <ul style="list-style-type: none"> <li>• Major network improvements were made including increasing network capacity, instituting network monitoring systems, and reconfiguring networks to improve speed and efficiency.</li> <li>• All schools’ network switches, routers and servers are operable 99.9% of the time, and are constantly monitored through Intermapper by Help Systems.</li> <li>• Real time school bandwidth utilization is currently tracked by the Cacti application, an open-source, web-based network monitoring and graphing tool. Cacti reports since January 2014 demonstrate that all Greenwich Public Schools operate on average at 20% of capacity, providing room for growth in use of online digital resources.</li> <li>• Spot speed tests conducted prior to Phase I device deployment indicated average classroom download speed meets industry standard of 25 MBPS based on School Speed Test.org.</li> <li>• Over 1,000 devices currently deployed in Phase I and Phase II schools (with only 2 broken iPads at year end)</li> <li>• Technology support plans were developed and implemented district-wide</li> </ul>	<p>The District has an adequate network topology to support current “one to one” environment specifications.</p> <p>Wireless density must continue to be assessed to support fast, consistent internet access in all school buildings.</p> <p>More student and staff data must be moved to the cloud, better leveraging recent investments in infrastructure and relying less on aging server hardware.</p>

Work Stream	Planned Steps Implemented	Lessons Learned
Project Management	<p><b>Status: Implemented as Planned</b></p> <p>DLE Year 2 was implemented on-time and under budget.</p> <p>Project tasks organized by work stream with clear accountability by work stream owner. Progress tracked bi-weekly and most project milestones met as planned.</p>	<p>Further thinking about how to scale the communication of tactical decisions and actions is needed as more schools join the DLE.</p>
Program Evaluation	<p><b>Status: Partial Implementation</b></p> <p>The Teacher and Student Technology Readiness Surveys (see Exhibit 10) were implemented as planned. Extensive school level reports at teach grade band level have been prepared with school level results from the teacher and student technology readiness surveys. The DLE team will be reviewing the results with each school's administration to inform the development of personalized professional learning plans for Year 3.</p> <p>The Quality Feedback and Google Docs study was compromised when the control school dropped out of the study, citing lack of time to participate. However, the data collected from the study has proven tremendously valuable in assessing the fidelity of implementation of the district's Teaching Pathways writing program and provided critical data on the usefulness of Google docs versus Schoology as a feedback tool.</p>	<p>The technology readiness surveys are valuable tools to provide an indication (albeit self-reported) of shifts in practice and skills required to implement the DLE. Principals need to enforce teacher completion of the baseline technology readiness surveys and use the results for follow-up and to develop individual PL plans. Surveys should be updated for Year 3 to capture lessons learned in Year 2.</p> <p>Future research studies need a guarantee from participants that they will not drop out of the study and comply with the study design.</p> <p>GPS needs to build capacity to conduct evaluation activities to define instructional excellence and monitor the fidelity of implementation of district curriculum and pedagogy. Principals need to make independent observations of change in practice in the classroom using the DLE Classroom Walk-Throughs and follow up with teachers to ensure PL is being translated to classroom practice.</p> <p>Lastly, additional evaluation work is needed to understand how on average how much time students spend on DLE devices each day and how the DLE is advancing student outcomes. The Phase III program evaluation has studies in reading and math.</p>

### Year 3 Objectives

- Continue to hold regular DLE SC and ETAG meetings; ensure the new School Data teams are functioning appropriately, improve communication of tactical decisions
- Continue to collect data on organizational success metrics by workstream
- Continue to collect best practices information to inform DLE effort
- Align district policies and procedures to support digital learning with clear expectations and defined responsibilities for students and staff
- Continue refining the IT service model to include online support and create service level agreements, helping to realize better service and efficiencies
- Continue to improve DLE support at the school level, including aligning the role of library media specialists and MTA with DLE goals
- Conduct Phase III program evaluation
- Need to improve district capacity for program evaluation (e.g., principal walk-through tool, impact of DLE on student work)
- Better understand how specific practices and applications accelerate student learning

## Hardware Leasing

### Overview

One of the touchstones of the Digital Learning Environment initiative is the full “one-to-one” deployment of devices to staff and students in Year 3 of its implementation. From a budget standpoint, this line item includes:

- Devices
- Cases
- Keyboards (for grades 2-5)
- Charging carts
- VGA Adaptors and software to enable presentation on Smartboards

### Selection Process for the Phase III Device

The Superintendent chose to implement the following devices for student and staff use after careful consideration of all factors including review of the device ratings, price, and input from the Digital Learning Environment Steering Committee (DLE SC) and the Digital Learning Advisory Committee (DLAC),

- preK-5:1 iPad Air
- 6-8: Lenovo Thinkpad Yoga 11e, Chromebook
- 9-12: Lenovo Thinkpad Yoga 11e, Chromebook

### Narrative of the Digital Learning Environment (DLE) Device Selection Process

The DLAC, comprised of teachers, school and district administrators, and instructional coaches, began meeting in the Fall of 2014 to determine the digital devices. DLAC organized three device selection sub-committees to research and rate devices by grade level (elementary, middle and high) at the October 1 DLAC meeting. Each DLAC device selection sub-committee created a list of criteria for device selection at the October 1 DLAC meeting.

The following devices were considered by DLAC, representing a range of operating systems and manufacturers, and working within the district’s cost guidelines:

- ACER Chromebook 720P
- HP Chromebook
- Lenovo Thinkpad Yoga 11e, Chromebook
- Lenovo Thinkpad Yoga 11e, Windows Operating System 8.1, non-Pro
- Transformer T200
- ASUS x200MA
- iPad Air

The Digital Learning Advisory Committee (DLAC) recommended the following devices by grade level:

- preK-5: iPad Air
- 6-8: Lenovo Thinkpad Yoga 11e, Chromebook
- 9-12: Lenovo Thinkpad Yoga 11e, Chromebook

The DLE SC adopted these recommendations. These decisions were made after careful consideration of all factors including rating of devices on collaboratively developed criteria by grade level and price. Overall, continuation of the iPad Air was recommended for grades preK-5. A laptop device with an integrated keyboard and/or Chromebook was felt to be the most useable and cost-effective solution for grades 6-12.

### Year 3 Objectives

- Evaluate Mobile Device Management (MDM) solution and revise workflow as needed
- Evaluate devices after full implementation of Phase III
- Continue to plan for the absorption of a 1:1 device model in the operating budget

## Infrastructural Improvements

The District's network has been extensively upgraded since the 2013 Pearson Report generally identified the following areas for improvement to the District's general Internet access and its wide area network (WAN):

- Eliminate Bottlenecks: The District uplink to the internet was not deemed fast enough to support a one-to-one educational environment; the private VPN from the District to Bat Blue served as a significant bottleneck.
- Route Internet Traffic Intelligently: Prioritize traffic by implementing a quality of service system (QoS); reduce repetitive traffic to the same Internet sites by implementing caching proxy servers.
- Create Redundancy: Redundancy in the physical Internet service provider (ISP) structure and the WAN was needed.

During the 2013-14 school year, the District made the following major upgrades to remediate the issues identified in the Pearson report:

- A second uplink for GHS back to the Internet was created, removing approximately 50% of the District's Internet traffic from the uplink shared by the remaining elementary and middle schools. Additionally, the original District uplink was upgraded to perform 10 times faster, matching the speed of the new GHS uplink.
- To ensure the District's ability to access the internet in the event of damage to either one of its two uplinks, a high-speed fiber optic pathway was installed to connect the two hubs (GHS and Havemeyer).
- Quality of Service (QoS) rules were implemented that prioritized internal District traffic from the wireless staff and student Service Set Identifiers (SSIDs) over external traffic on the Guest SSIDs of each school.

The District's network configuration was further refined during the 2014-15 school year, with the following summary of remediation:

- All teacher and student data storage, with the exception of Greenwich High School, was migrated to secure offsite vendor servers (i.e., the "cloud") reducing the load on internal servers and the labor hours needed to maintain them.
- All schools are now connected to the District's uplinks by high-speed, 10-GB fiber optic connections.
- All District wireless access points (WAPS) now communicate over the 5Ghz spectrum using the high-speed 'n' protocol

## District Data Storage

To further increase network performance, the client-server architecture of all elementary and middle school computers was reconfigured (Apple Mobile Accounts were implemented), reducing the unnecessary transfer of data within the WAN. The District has also completed its migration away from the aging town 1 GB/s Lightpath equipment, using 10 GB/s dark fiber optic cable to connect each school location directly to the District's Internet uplink.

### Year 3 Objectives:

- Migrate away from the aging school-based data server architecture in favor of a cloud-based data storage system
- Evaluate the performance of the cloud-based http-proxy vendor and optimize performance of the implementation
- Continue to study the growth in infrastructure demands as a result of DLE

## Communications

A core work stream for the DLE initiative is to implement a comprehensive and integrated digital learning communications and stakeholder involvement plan. Communications are needed to create general project awareness, set stakeholder expectations, establish consistent messaging, solicit stakeholder involvement, and provide operational information.

Working with the Director of Communications, Chief Information Officer, and the DLE Project Manager, a comprehensive communication strategy has been drafted that leverages Board/Public Updates, Face-to-Face forums, electronic communication resources, including social media, local press relationships and internal communication channels. The DLE Communications Plan is organized in two parts, External and Internal. The communications emphasis in the second year of DLE implementation was primarily focused on preparations for rolling out Phase III. Phase III communications with Administrators, staff, and parents began a full six months earlier than in previous Phases of the project.

### External Communications (School & Community Awareness/Support)

The external component of the DLE Communications Plan targets all stakeholders, including the Board of Education, parents, Elected Officials (Selectmen, BET, RTM, etc.), the broader Greenwich community, and GPS staff and students. The overarching objective of this portion of the communication plan is to build awareness and support for creating a Digital Learning Environment. In addition to compliance-oriented metrics, success in this area is effectively measured by stakeholders' allocation of resources to support the implementation of a digital learning environment.

As the District entered Phase II of implementing the DLE, there was a better understanding of digital learning in Greenwich and, therefore, a better understanding of how to enhance communications to stakeholders for Phase II and III. In addition to timely and regular updates on milestone decisions and developments, the DLE Steering Committee will focus on increased use of visual and social media to heighten awareness and support for the DLE locally and regionally.

#### Board of Education (BOE)/Public Updates (written and presented):

As part of the accountability structure for the project, regular updates are provided to the Board of Education and hence, the public. This provides a communications opportunity for all stakeholders – to monitor progress and to provide feedback. All Board reports are posted to the GPS web site as part of the Board Packet as well as on the DLE pages of the site.

August 2014	DLE Program Evaluation Report to BOE, August 28, 2014
October 2014	DLE Presented as Part of Capital Plan for 2015-2016 at Oct. 9 BOE Meeting
November 2014 (through May 2015)	DLE included as part of BOE, BET & RTM Budget discussions
June 2015	IT/MIS Operational Update on DLE as part of Policy E-051 Monitoring Report, June 4, 2015 BOE meeting

#### Press Relations:

Phase I and II schools welcomed press to cover the second year of the DLE implementation. The local media presented stories on digital instructional strategies, the selection of devices for Phase III, DLE Parent workshops, online course opportunities, and preparing for the Phase III roll out.

#### Face-to-Face Forums:

Members of the DLE Steering Committee provided numerous face-to-face opportunities to engage stakeholders in question and answer sessions, and workshop opportunities for the Phase II and III schools, as well as for the broader GPS parent body. As referenced in the Board/Public Updates section, the Superintendent, Managing Director of Operations and the Chief Information Officer provided multiple face-to-face discussion opportunities for budget decision-makers at all levels. The Middle Schools presented parent workshops in Fall 2014, launching Phase II DLE implementation. DLE Steering Committee members worked closely with school leaders and media specialists to develop and deliver two series of parent workshops in the Winter and Spring of 2015 on the Phase III roll out.

#### Electronic Communication Channels:

The DLE Steering Committee used various electronic channels to communicate and celebrate the initiative's progress, including email, Parentlink, GPS Web Site, and the District's intranet portals. Written updates, Board Reports, Frequently Asked Questions (and answers), press releases, and, internally, training materials and professional learning sessions were sent/posted via these electronic communication channels. Riverside School Principal Christopher Weiss' use of Twitter expanded significantly in Year 2 of the DLE. With over 9,000 followers, Principal Weiss has become well known in the world of educational technology. He is a Finalist for the 2015 Bammy Awards as Innovator of the Year (<http://www.bammyawards.com/index.php/about/bammy-award-nominees-2015>). In general, the use of Twitter as a social media channel is increasing among District and school leaders.

#### **Internal Communications (Operational/Tactical)**

The internal component of the DLE Communications Plan targets GPS staff. District and school administrators are responsible for purposefully planning communications around each of the project work streams and major milestones. Communication in this area is more operational or tactical in nature, setting expectations and providing logistical information on DLE Goals, professional learning activities, curriculum development and mapping, device selection and procurement, software applications selection and training, systems implementation, survey administration, assessment administration, and DLE-related policies, procedures and practices. Effective operational communication facilitates the successful implementation of a digital learning environment and is measured using compliance metrics and the broader initiative's metrics for success.

In the second year of DLE implementation, there was an increased emphasis placed on internal communications, particularly in preparation for Phase III. The DLE Steering Committee was expanded to include representation from the Phase II and III schools, providing perspectives and input from schools new to the project. The DLE SC initiated written DLE Updates after each Steering Committee meeting distributed to all administrators. In late Fall 2014, as the device selection for Phase III was finalized, it became clear that the scale of the next Phase required much earlier communications and engagement with school leaders, staff and parents. In December 2014, the DLE SC developed a comprehensive roll out and communications plan for Phase III. In January 2015, the Phase III Roll Out Plan was presented to Principals, a full six months earlier than had been initiated for the previous two phases of the project.

After reviewing the roll out plan with school leaders, Phase III orientation with staff and parents began, through faculty meetings, professional development sessions, workshops and online communication channels. Communications strategies employed in Year 2 of the DLE will continue as DLE Phase III is implemented in 2015-2016.

**Year 3 Objectives:**

- Refine Communications Plan
  - Internally, to facilitate implementation of DLE Phase III, and
  - Externally, to expand stakeholder awareness and support
- Raise regional awareness of progress within DLE
- Define and achieve social media saturation benchmarks
- Revise District website to reflect design and usability principles

DLE Leadership looks forward to feedback from the Board of Education, staff, students, families and community on this major report on Phase II of this path-breaking endeavor for the GPS and Greenwich more generally. We move into Phase III with strong plans, seasoned by rigorous attention in the second year to evaluation and continuous improvement of ideas and directions. We are well into what still promises to be the lead approach for transforming teaching and learning in order to accelerate achievement for all GPS students.



## Exhibit 2. GPS Shifts in Practice by DLE Goal

- Students will demonstrate critical thinking of on-line content
- Students will demonstrate self-regulated learning
- Students will receive quality feedback on their work
- Learning will be more personalized for students
- Student will be ready to take the SBAC

We have defined skills and changes in practice required to achieve the district educational goals for the digital learning environment. We do not expect principals and teachers to have reached these goals until they receive professional learning, although some may be achieving these changes in practice on an individual basis. For each goal, we are analyzing frequency of reported behaviors on the following scale: *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day)*

### Critical Thinking for On-line Content

1. For this school year (2013-14) as of today, how frequently have your lessons required students to:

- **Define a problem:**

- Define a problem through identifying term definition, facts and other relevant information using an appropriate on-line resource (e.g., outside experts, websites, search engines)

- **Locate Information:**

- Locate a variety of online sources to help solve a real world problem

- **Evaluate Information:**

- Find and evaluate online content to answer empirical questions

- **Synthesize Information:**

- Develop an understanding of real world problems using current information on-line

- **Communicate Information:**

- Communicate information to specific audiences in an effective and coherent manner
- Use multiple means of representation such as audio, video, image and text

## 2. Self-Regulated Learning

For all subject areas, how frequently do your students:

- Create and store their work in a digital work portfolio?
- Document and reflect on their work at multiple points throughout completion of the work process
- Co-create rubrics with you, collaborating to define expectations and elements of quality work?
- Receive exemplars of quality work, reflections and iterations, including work from previous students?
- Self-assess and reflect on learning as part of their responsibility for learning

## 3. Provide quality feedback

How frequently:

- Do you use digital resources to embed feedback in student work that is still in process (E.g., on Google Drive using forms, or on Schoology)?
- Do you use a wide range of formative assessments to gain deeper insight into student needs and understanding, and to provide immediate feedback, correct misconceptions and challenge the thinking of each student?
- Do you provide students with assessment criteria and individualized descriptive feedback to help them improve their performance and assume responsibility for their learning?
- Do you support students' progress by communicating academic and behavioral performance expectations and results with students, their families and other educators;
- Do students have an opportunity to publish their work for peer reflection and support?
- Do students have an opportunity to publish their work for parents?
- Do students have an opportunity to receive feedback on independent work?
  - teacher-to-student
  - student-to-student
  - field expert-to-student

#### 4. Personalized learning

How frequently do:

- Students work in small groups or individually in situations that allow you time to walk around and work directly with individual students?
- Instruction is responsive to students' choice and interests
- Students are able to work at their own pace to master skills and knowledge
- Students participate in on-line threaded discussions where students help facilitate and all students are more likely to participate?
- Is technology used to automate provision and tracking of individual learning plans personalized for each student's goals and skill levels (e.g., RAZ-Kids, RTI studio)?

#### 5. Readiness for SBAC

- Have you taken any practice SBAC tests to familiarize yourself with the platform? (**Yes, No**)
- Have your students taken any practice SBAC tests? (**Yes, No**)
- Have you received training on the SBAC navigational control functions (e.g., use of function keys on the test)? (**Yes, No**)
- Have your students received instruction on how to navigate within the SBAC platform, e.g., use of the split screen, use of the function keys? (**Yes, No**)
- Do you believe your students will know when to ask for help if they run into a technical problem on the SBAC? (**Yes, No, Maybe**)

Exhibit 3. Year 3 DLE High Level Project Milestones

Milestone/Event	August	September	October	November	December	January	February	March	April	May	June	OWNER
<b>Project Management</b>												
Charge for 15-16 Committees published by August 19	Δ											Ullman
School Based DLE Leadership Team (formerly DLAC)		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Ullman
Leadership Council		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Dunn
Curriculum Alignment within DLE		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Parisi
E-TAG			Δ			Δ				Δ		Ullman
Publish FY17 DLE Capital Budget Proposal			Δ									Dunn
Ambassadors			Δ			Δ				Δ		Kompar
DLE Dashboard- Organizational Exec Metrics		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Ullman
<b>Infrastructure</b>												
Network Upgrades Completed	Δ				Δ		Δ					Gunnip
Network Monitoring Protocol Implemented	Δ											Gunnip
Migration from Local GHS Data/Directory Servers											Δ	Gunnip
Field Test of wifi Complete for SBA							Δ					Gunnip
<b>User Support</b>												
Updated Support Plan Published (SLA, Scope, etc.)		Δ										Dunn
Provide Tech. Training to MTAs												Gunnip
Provide Training to Media. Specs		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Kompar
Media Spec. Training on Ticketing System		Δ										Kompar
MTA Refresher Training on Ticketing System (beg. Aug 24)	Δ											Gunnip
<b>Professional Learning</b>												
PL Needs Assessment	Δ									Δ		Ullman
PLAC		Δ	Δ	Δ	Δ	Δ	Δ					
PL full day	Δ			Δ								Ullman
PL half day		Δ	Δ			Δ		Δ		Δ		Ullman
Finalize Year 4 PL plan											Δ	Dunn
<b>Device Management</b>												
New Filtering Mechanism Implemented	Δ											Gunnip
Apple ID for students at 80% Completion	Δ											Gunnip
Tech Workshop at Title I Schools		Δ										Gunnip
Collect necessary devices from students exiting level (collect from seniors, distribute to 5th)										Δ		Gunnip
<b>Curriculum, Instruction, and Assessment</b>												
Level Groups Populated in Schoology	Δ											Gunnip
Resources Populated in Each of the Level Group		Δ										Parisi
Publish Guide on Accessing the Curriculum including Updates		Δ										Parisi
Revise and Publish Implementation Guides (incl. Digital Toolbox - Release 2)	Δ											Kompar
Revise Digital Toolbox and Republish Implementation Guides						Δ						Kompar
Finalize Digital Tollbox for Year 4										Δ		Kompar
GHS Digital Citizenship course completed		Δ										Kompar
6-12 devices taken home		Δ										Kompar
K-8 Digital Citizenship course completed			Δ									Kompar
2-5 devices taken home			Δ									Kompar
<b>Program Evaluation</b>												
Phase II Program Evaluation Finalized	Δ											
3-Year Program Evaluation Finalized	Δ											
Issue Phase III Student Technology Readiness Baseline Surveys (grades 7-12)			Δ									
K-8 Principal classroom walkthroughs		Δ				Δ				Δ		Flanagan

**Exhibit 3. Year 3 DLE High Level Project Milestones**

Milestone/Event	August	September	October	November	December	January	February	March	April	May	June	OWNER
GHS Principal classroom walkthroughs		Δ								Δ		Flanagan
SBA Administration								Δ	Δ	Δ		Parisi
Issue end of year Technology Readiness Surveys											Δ	Ullman
<b>Communication</b>												
August Summer Packet Update	Δ											Kompar
DLE Board Report presentation		Δ										Dunn
DLE parent workshops		Δ										Kompar
Update DLE district webpage	Δ											Eves
Boys and Girls Club Newsletter		Δ										Dunn
Press Release (Phase III launch)		Δ										Eves
Monthly DLE Newsletter Update (parents and staff)		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Dunn
Parentlink e-Newsletter (parents)		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Eves
Schoology DLE Best Practices Blog (staff)		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Parisi
Celebrate national digital learning day							Δ					Kompar

## EXHIBIT 4

**TO:** All GPS Principals, Assistant Principals, Classroom Teachers, and all Certified Staff

**CC:** Dr. McKersie

**FROM:** Phil Dunn and the DLE Team

**DATE:** May 15, 2015

**SUBJECT:** Full Implementation of the DLE

### MEMO

#### Overview

Please review the following document that outlines the Digital Learning Environment (DLE) goals, core practices, and sample tasks. This document captures feedback from many District administrators regarding how each Phase III school may get started within the DLE. The DLE provides tools that support the effective pedagogy already demonstrated throughout the District. The use of digital devices helps students connect to their work, their world, and each other.



## Getting Started With the DLE

### *Guidelines for Administrators and Staff*

The Digital Learning Environment (DLE) is designed to provide teachers with the resources necessary to both innovate and differentiate instruction according to the needs of each student and for students to personalize their own learning, making choices about how they learn and present their new knowledge.

The DLE should inspire teachers to implement creative technology practices as the District moves to full implementation (DLE). The District expects that every teacher will take a blended approach to lesson design and delivery, and will use the devices, as appropriate, to facilitate student learning. It is expected to take three years of implementation (SY16-SY18 for Phase III) to achieve all goal areas, described below, across the District. We need all staff to make progress.

- While all of the DLE educational goals are meaningful and transformative, buildings/programs are encouraged to begin their journey by focusing on one goal within their first year of practice. Teachers would expect to implement incremental shifts in practice during the next three years that result in purposeful learning outcomes for students.

#### **GOAL 1: Students as Critical Thinkers of Online Content**

- The societal shift to digital information production and its resulting abundance of online information, is enabling far more people than ever to contribute original thought and expression to an ever-growing audience. Through inquiry-based units of study, students find, evaluate, use and communicate information in innovative ways.

#### **GOAL 2: Students as Self-Regulators of their Learning**

The DLE seeks to empower the student as the driver of their own learning. This goal reflects the vision that students choose the course and pace of their own learning, so that they can make the learning their own. The sub-goals in this area offer students a choice from among areas of interest, depth and pacing of classroom work.

#### **GOAL 3: Quality Feedback**

- This goal focuses on the benefits of providing feedback to students that is timely, relevant, and specific. The DLE allows students and teachers to collaborate in ways that complement the existing classroom environment. It also allows peer to peer and teacher to student feedback to be more easily captured for later reflection.

#### **GOAL 4: Personalized Learning**

The DLE seeks to personalize learning for all students. By accommodating each students' learning style, and preferred mode of expression, students will feel empowered to own their learning.



### CORE TEACHER PRACTICES FOR YEAR 1 (SY2015-16 for Phase III Schools)

The DLE is not a separate initiative, but offers more enhanced and productive ways of delivering the current GPS curriculum. Technology is one tool, among many, used to plan, design and deliver instruction. There are compelling practices within the DLE that leverage technology to provide greater student engagement, rigor, and personalization. As the District moves toward full implementation, there are core practices that all teachers are expected to demonstrate as they begin their journey. The District is providing extensive professional learning and support for all teachers to achieve these practices. These practices represent guidelines to get started with the DLE (including, but not limited to):

- Participate in DLE Professional Learning where instruction will be provided to achieve the practices below
- Focus on achieving one DLE goal (and associated sub-goals) chosen by your building/program
  - Link to Goals and Sub-goals <https://goo.gl/KfTO5y>
  - Students as critical thinkers of online content
  - Students as self-regulators of their learning
  - Quality feedback
  - Personalized learning
- Use Google Apps (e.g., Docs, Slides, Sheets) to embed feedback in a piece of student work still in process (Gr. 3-12)
- Import a unit (or part of a unit) of your choice, with instructional materials and assessments into Schoology
  - Incorporate a discussion thread within a Schoology unit, when appropriate, at least once during the year
  - Digitally share at least one piece of exemplary student work, with a rubric, with your students
  - Share at least one lesson with grade level or department teams online
  - Post assigned homework in Schoology (Gr 6-12 mandatory)
  - Issue a formative assessment using Schoology to help build a digital Professional Learning Community (PLC)
- Complete SBA on DLE Devices

For the 2016-17 school year, we will update this document based on a comprehensive needs assessment and publish additional practices that teachers may wish to try.

The Greenwich Public School District is committed to a policy of equal opportunity/affirmative action for all qualified persons. The District does not discriminate in any employment practice, education program, or educational activity on the basis of **race, color, religious creed, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, disability, genetic information, or any other basis prohibited by Connecticut state and/or federal nondiscrimination laws.**

## Exhibit 5

### List of DLE Governance Committees

SY 2014-15

We would like to formally thank all the members of these groups who were instrumental to the successful implementation of Phase II of the DLE.

<b>DLE Steering Committee (DLE SC)</b>	<b>Digital Learning Advisory Committee (DLAC)</b>	<b>Executive, Technology Advisory Committee (E-TAG)</b>
Patricia Allen, <b>Principal, Parkway Elementary School</b>	Audrey Barrette, <b>2<sup>nd</sup> Grade Teacher, Riverside Elementary</b>	William McKersie, <b>Superintendent</b>
Ben Branyan, <b>Managing Director of Operations</b>	Fionnuala Browning, <b>Library Media Specialist, Riverside Elementary School</b>	Mike Spilo
Phillip Dunn, <b>CIO</b>	Chris DiAngelo <b>User Support Analyst</b>	Joanne Steele, <b>CIO, Iona College</b>
Kim Eves, <b>Director of Communications</b>	Sheila Civale, <b>Program Coordinator Math and Science</b>	
Ralph Mayo, <b>Principal, Eastern MS</b>	Phil Dunn, <b>CIO</b>	
Irene Parisi, <b>Assistant Superintendent of Curriculum, Instruction, and Professional Learning</b>	Trudi Durrell, <b>Program Coordinator, ELL</b>	
Richard Piotrkowski, <b>Assistant Headmaster, Greenwich High School</b>	John Ehlinger, <b>Teacher, ALP JC</b>	
Nona Ullman, <b>DLE Project Manager</b>	Aimee Farnum, <b>Teacher, GHS Science Teacher</b>	
Christopher Weiss, <b>Principal, Riverside Elementary School</b>	Stephen Farnum, <b>Science Coach</b>	
	Janice Gunnip, <b>Director of Educational Technology</b>	
	Antoinette Fornshell, <b>Program Coordinator, ELA</b>	
	Erin John, <b>Kindergarten New Lebanon</b>	

	<b>Digital Learning Advisory Committee (DLAC)</b>
	Fran Kompar, <b>Library Media Specialist</b>
	Jennifer Lau, <b>Library Media Specialist, Central Middle School</b>
	Gaspare Lipari, <b>English, ALP and Seminar Teacher, Western Middle School</b>
	Jeannine Madoff, <b>Library Media Specialist, ISD</b>
	Karen Martin, <b>User Support Analyst</b>
	Terry McCabe, <b>Library Media Specialist, WMS</b>
	Matthew Meyers , <b>Teacher, Chemistry - GHS</b>
	<b>Ezra Murray, 5<sup>th</sup> Grade Teacher, ISD</b>
	Lorraine Najam, <b>Teacher, ELL, WMS</b>
	Kim Papa, <b>4<sup>th</sup> Grade Teacher, Hamilton Avenue</b>
	Irene Parisi, <b>Assistant Superintendent of Curriculum, Instruction, and Professional Learning</b>
	Diane Rasweiler <b>Teacher, SPED, Havemeyer</b>
	Nona Ullman, <b>DLE Project Manager</b>
	Karrie Vale, <b>5<sup>th</sup> Grade Teacher Parkway ES</b>
	Laura Jean Waters, <b>Library Media Specialist, GHS</b>

## EXHIBIT 6

Greenwich Public Schools DLE Evaluation  
2014-15 School Year

### **Teacher feedback on student essays written with and without Google Docs**

*Fiona Hollands & Yilin Pan*  
*Teachers College, Columbia University*  
*August 1, 2015*

### **Study design**

**Participants:** 93 fourth grade students and four teachers from Riverside School.

**Goal of study:** The original goal of the study was to investigate whether and how the use of Google Docs for essay assignments would change the amount and nature of written feedback received by 4<sup>th</sup> grade students from their teachers, as compared with students not using Google Docs.

Subsequently, we planned to investigate whether any such change could be associated with greater gains in essay scores over the year as compared with students who did not use Google Docs.

In practice, all four teachers participating in the study were keen to use Google Docs throughout the year such that we did not have a comparison group of “business as usual” to allow us to isolate the effects of Google Docs from other effects. Instead, for the *same* group of students, we reviewed the quantity and type of feedback received when writing an essay with Google Docs at the end of the school year with that received when writing an essay without Google Docs earlier in the school year.

Note that we would expect other factors in addition to the use of Google Docs to influence the frequency and type of feedback received: clearly all students would be expected to gain in writing skills over the course of the year, with or without Google Docs, so we might also expect the nature of feedback to change. We would also expect different types of feedback to be provided depending on the type of essay being written.

#### **What the students and teachers did over the course of the study:**

##### ***Mid-year Opinion essay written without Google Docs***

Between December 2014 and February 2015 students from the four 4th grade classes at Riverside School completed an initial “baseline” essay as per “business as usual,” that is, using a word processing program to write each of three drafts and a final essay, handing each in to the teacher on paper, and receiving verbal and handwritten comments along the way from the teacher, in addition to paper-based essay rubrics.

Teachers were asked to use the same process for providing feedback to students:

- ❖ students write a **first** draft
- ❖ teacher provides written feedback on paper
- ❖ students write a **second** draft
- ❖ teacher provides written feedback on paper
- ❖ students write a **third** draft
- ❖ teacher provides verbal feedback
- ❖ students write a **final** version of essay

- ❖ teacher assesses the final essay using the Teachers College Writing Pathways rubric and assigns a score.

Teachers were also asked to complete time logs indicating how much time per day they spent providing feedback on the essays, both verbal and written. We were able to collect time logs from three teachers for the Opinion essay unit. These teachers each reported spending between 12 and 19 hours providing feedback on the students' work (16 1/3 hours per teacher on average). All three teachers provided written feedback on the first, second, and third essay drafts, and two teachers also reported providing written feedback on the final essay. The average amount of time spent on written feedback was 9 1/3 hours per teacher. All three teachers reported giving verbal feedback on the first two drafts and one teacher also gave verbal feedback on the third draft and on the final essay. The average amount of time spent on verbal feedback was around 7 hours per teacher.

After the Opinion essay unit was completed, the research team asked teachers to share copies of the first and second drafts of their students' Opinion essays, and the final essays with the scoring rubrics. We did not ask for the third essay drafts as we did not expect any written comments on those. However, as reported above, it was apparent from the time logs that some teachers did provide written comments on the third essay drafts. Some of these third drafts were made available to us but, because we did not specifically ask for them, most were not. This prevents us from tallying the total number and type of comments given on all drafts. Additionally, some students received a rubric assessment for each draft as well as for the final essay, and some of these rubrics carried additional written comments from the teacher.

### ***End of Year Comparative essay written in Google Docs***

Between April and June 2015 each student from the four 4th grade classes at Riverside School completed a Comparative essay using Google Docs and shared the document with his/her teacher for comments and editing.

The process of writing drafts and a final essay played out somewhat differently in Google Docs because a single document is continuously updated and accessible to the teacher, that is, it can be edited and commented on electronically at any time. Additionally, it appears that teachers and students shared work and feedback using a combination of Google Docs and Schoology. For example, one teacher reported that students' final essays and rubrics were submitted and graded on Schoology while the working draft was written and commented on in Google Docs. Another teacher had students work on Google Docs which were shared with the teacher for review and comment. However, in order for the teacher to provide a rubric assessment, the students were asked to copy and paste each draft into Schoology. The teacher scored the essay rubric and wrote comments on it in Schoology and then the students would revert to Google Docs to carry out the necessary revisions. One teacher pasted both word-processed comments and rubrics at the end of the Google Doc Comparative essay rather than using either Schoology or the Google Docs edit and comment functions to provide feedback.

Generally, we found that teachers reviewed the Google Docs essays 2-3 times throughout the Comparative essay unit, somewhat equivalent to commenting on 2-3 drafts. However, some essays were only reviewed once by the teacher and some four times. Additionally, in some cases other students were invited to view the Google Docs essays and comment on their peers' work.

Teachers were again asked to complete time logs indicating how much time per day they spent providing feedback on the essays, both verbal and written. We were able to collect a time log from one teacher for the Comparative essay unit. This teacher reported spending 12 1/2 hours in total providing

written feedback on the first and second essay drafts (9 2/3 hours) and verbal feedback on all 3 drafts (almost 3 hours). Because no teacher completed a time log for both essays, we cannot assess how feedback time use changed between the paper-based essay and the electronic essays. One teacher speculated that writing comments is faster on Google Docs but that editing is “*not efficient*.” Scoring the rubric was reportedly faster when using Schoology. Using electronic media eliminated the “*hassles*” of a lot of paper but, when printing was necessary, the documents had to be accessed on a desktop rather than on the mobile devices the students used for writing.

Once the Comparative essay unit was complete, we asked the teachers to share the Google Docs essays with us so that we could review the feedback provided.

### Data analysis

To analyze the frequency and nature of feedback received, we identified 5 students from each of the four classes for whom we could access both a first draft of the Opinion essay with handwritten comments and a “first draft” of the Comparative essay with comments visible in the Comments function of Google Docs. To identify a first draft of the Google Docs essay, we used the “Revision History” function to restore each student’s essay to the version from the first date on which the teacher made comments. We reviewed the teacher’s edits on this version and opened the list of Comments to identify feedback comments given on this date. Note that it would be harder to equate a second or third draft of the Opinion essay with later Google Docs revisions of the Comparative essays because the Google Docs essays were reviewed by the teachers between one and four times.

Feedback comments on each of 20 first draft Opinion essays and 20 first draft Comparative essays were counted and categorized into different types.

### Results

#### Feedback provided on the essays

Overall, we counted 245 items of feedback on the 20 Opinion essays and 125 on the 20 Comparative essays, not including comments on the rubrics. A reduction in the number of comments provided in the Comparative essays occurred for all four teachers, dropping from an average of 12.25 comments per student for the Opinion essays to 6.25 comments per student for the Comparative essays.

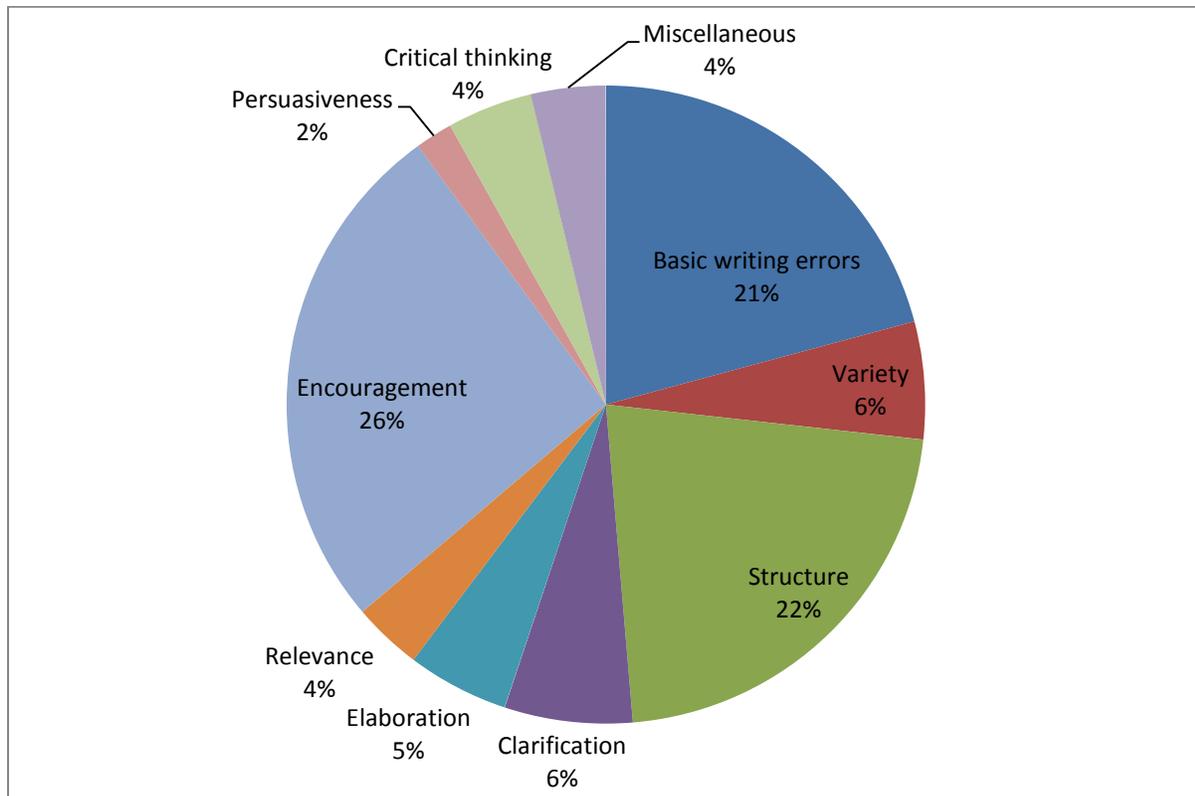
We found that each piece of feedback in the 40 essays addressed one of the following issues:

- Basic writing errors
- Variety
- Structure
- Clarification
- Elaboration
- Relevance
- Encouragement/reinforcement
- Persuasiveness
- Critical thinking
- Miscellaneous

Figure 1. indicates the percentage of feedback that fell into each of these categories. Over a quarter (26%) of the feedback was some form of **encouragement** or reinforcement for the student. This

included general encouragement such as "Awesome!" and more specific encouragement such as "Nice job using your notes to find evidence to support your opinion."

**Figure 1. Percentages of teacher feedback that fell into each category for all essays combined**



22% of the feedback addressed issues of **structure**. For example, the teacher might suggest splitting a long or complex sentence in two, or remind the student about the need to start each body paragraph with a lead sentence followed by several detail sentences.

21% of the feedback addressed **basic writing errors** including spelling, punctuation, grammar, or missing words.

6.5% of the feedback asked for some sort of **clarification**. This might be as simple as asking the student to identify to whom a pronoun referred, or as challenging as asking the student to clarify the thesis of the essay.

6% of the feedback suggested eliminating repetitive text or increasing the **variety** of words used.

5% of the feedback asked the student to **elaborate** more on an idea, for example to provide additional examples to illustrate a concept such as friendship, or to explain a claim made by the student.

4% of the feedback encouraged **critical thinking**, for example asking the student how the evidence provided supported his/her claim, or asking for illustrations of how a concept applies in real life.

3.5% of the comments questioned the **relevance** of a phrase, idea, or detail, for example, whether the topic idea was relevant to the overall essay theme, or whether details in a paragraph really supported the topic sentence.

2% of the comments addressed the **persuasiveness** of an essay, ranging from starting with a stronger essay title to asking the student to provide specific evidence to support a claim.

4% of the feedback comments did not fall into any of these categories and were labeled **“Miscellaneous.”** These included comments such as “Fact check,” “Clever, but not your words,” and “Decide what you want to say before you start writing.”

Table 1 reports the frequency and percentage of each type of feedback in total, and separately for the Opinion essays and the Comparative essays. Figure 2 visually compares the frequency of comments in each feedback category in the Opinion essay vs. the Comparative essay. Figures 3 and 4 show the percentages of feedback falling into each category for the Opinion essays and Comparative essays respectively.

**Table 1: Frequencies and Percentages of Teacher Feedback Categories (not including rubric comments)**

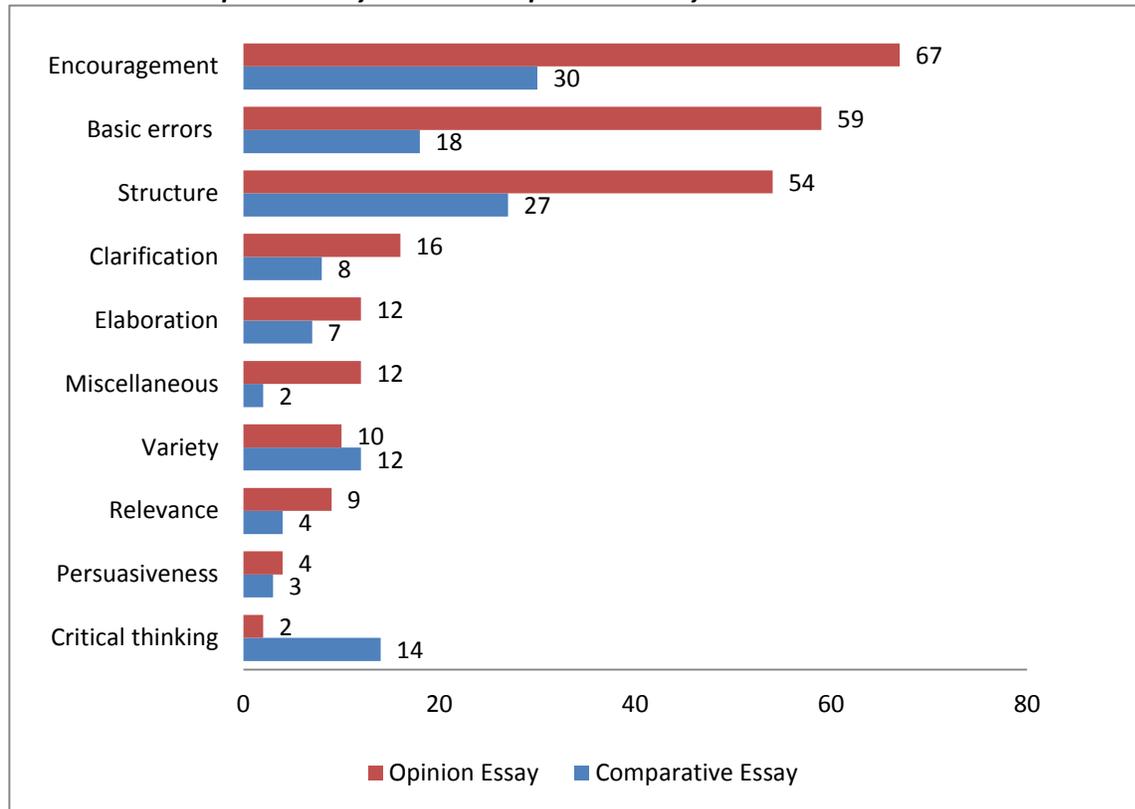
Category of feedback	Opinion Essay		Comparative Essay		Total	
	Frequency	%	Frequency	%	Frequency	%
Encouragement	67	27.3%	30	24.0%	97	26.2%
Structure	54	22.0%	27	21.6%	81	21.9%
Basic writing errors	59	24.1%	18	14.4%	77	20.8%
Clarification	16	6.5%	8	6.4%	24	6.5%
Variety	10	4.1%	12	9.6%	22	5.9%
Elaboration	12	4.9%	7	5.6%	19	5.1%
Critical thinking	2	0.8%	14	11.2%	16	4.3%
Miscellaneous	12	4.9%	2	1.6%	14	3.8%
Relevance	9	3.7%	4	3.2%	13	3.5%
Persuasiveness	4	1.6%	3	2.4%	7	1.9%
<b>Total</b>	<b>245</b>	<b>100.0%</b>	<b>125</b>	<b>100.0%</b>	<b>370</b>	<b>100.0%</b>

The biggest drop in frequency of feedback in the Comparative essays occurred with respect to basic writing errors (from 59 to 18), encouragement (from 67 to 30), and structure (from 54 to 27). The number of comments that prompted students to think critically about their work increased from 2 in the Opinion essays to 14 in the Comparative essays. In percentage terms, basic writing errors were the topic of 24.1% of the feedback comments on the Opinion essay but only 14.4% of the Opinion essay comments, a statistically significant drop ( $p < .05$ ). Conversely, less than 1% of the comments on the Opinion essay fell into the critical thinking category compared with 11% of feedback on the Comparative essay, a statistically significant increase ( $p < .05$ ). The percentage of comments addressing variety of language more than doubled from 4% in the Opinion essay to almost 10% in the Comparative essay, but this was not statistically significant. The proportion of comments that addressed structure or provided encouragement remained approximately the same for both sets of essays.

It is not clear whether the observed changes resulted from the use of Google Docs to provide feedback, whether students’ writing accuracy and structure had improved enough to elicit fewer corrective comments, or whether teachers deliberately aimed to provide different types of

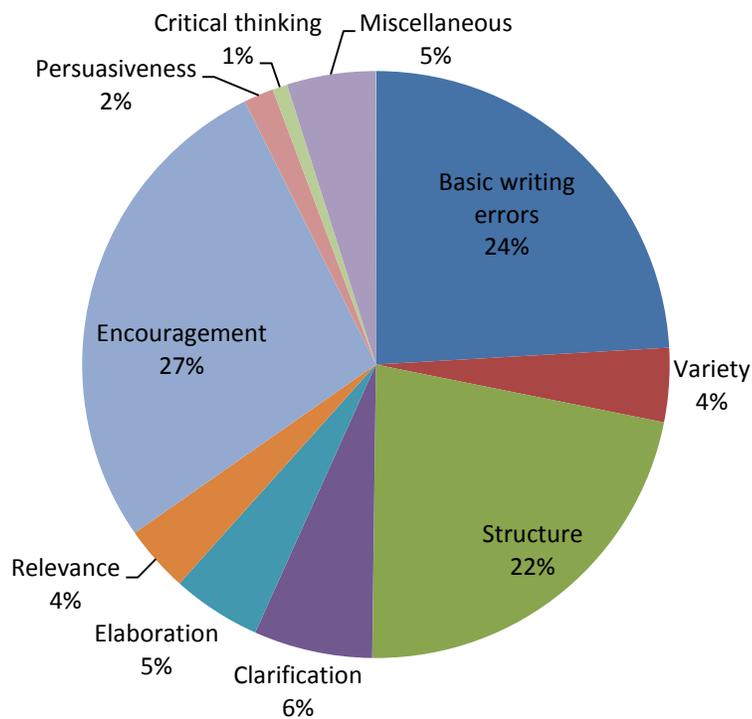
feedback according to the type of essay written and the time of year. It is feasible to assume that all three factors were influential to some degree. One teacher reported that the Opinion essay is “fully guided and needed more conferring because it was their first published essay” while the Comparative essay was “...much more hands off to see what they had internalized. Less guidance, less conferring.” The automatic availability of spell checking in the electronic media reduced the need for teachers to point out spelling errors but we note that many of the students ignored words underlined in red by the spell checker in the drafts we reviewed.

**Figure 2. Comparison of the number of feedback comments in each category provided by teachers on the Opinion essays vs. the Comparative essays**

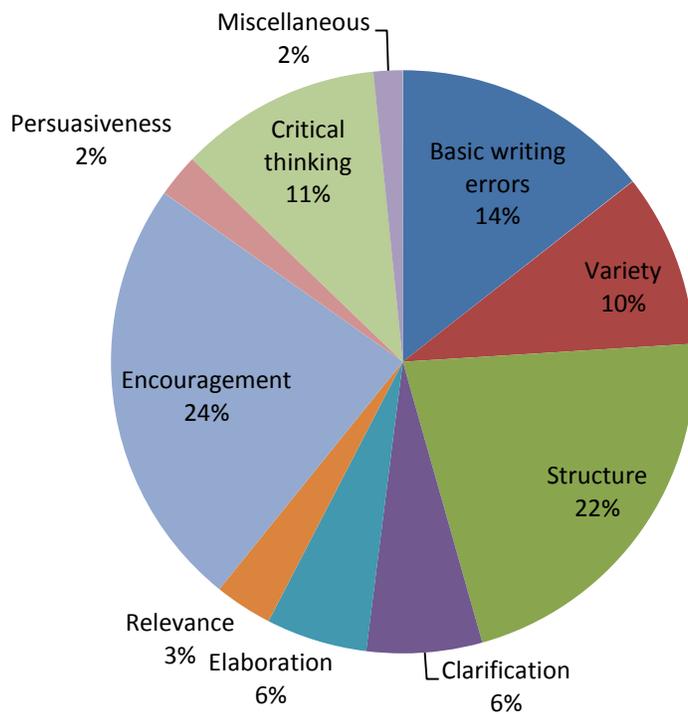


It was clear that teachers were not able to use the same kind of markings on Google Docs as when commenting by hand. For example, there is no equivalent of the check mark, circling (although highlighting is possible), drawing lines, and arrows. One teacher expressed a preference for using Schoology over Google Docs because the former allows the teacher to draw directly on the document while Google Docs does not. Teachers rarely took advantage of the edit function in Google Docs but instead mostly used comment boxes. As mentioned previously, one teacher did not use any of the Google Docs features for commenting or editing but simply pasted comments and the rubric at the end of the Google Doc essay. Furthermore, a few technical issues arose in the use of Google Docs causing some teacher comments to be lost in transition from one device to another. One teacher explained the issue:

**Figure 3. Percentages of teacher feedback that fell into each category for Opinion essays**



**Figure 4. Percentages of teacher feedback that fell into each category for Comparative essays**



*“I did have several students that had to cut and paste from one Google Doc to create a new document because the versions were not synching. Revisions would appear on the student's iPad, but the version shared with me wouldn't show the changes. This was a known bug that was correctable with an update... For those students, when they had to create a new document, they would lose any comments from the original.”*

Additionally, at each transfer from Google Docs to Schoology, the teachers’ Google Docs comments would be eliminated. To minimize the noise created by these issues, for the purposes of our analysis we deliberately chose to analyze comments on first drafts only for a subset of students from each class for whom it appeared that comments were not lost.

### Feedback provided on the rubrics

In addition to comments written on the body of the Opinion essay, two of the teachers provided students with 6-item rubrics indicating for the first essay draft whether each of the following aspects of the essay were “beginning,” “developing,” or “secure:” thesis statement, lead, transitions, conclusion, organization, and elaboration. One teacher used an expanded version of this rubric with numerical scores (1-5) and descriptions of what was required to earn a particular score. It appears that some teachers provided a rubric after each draft as well as a scored rubric for the final essay, while others did not use them for every draft. Many rubrics had additional comments written on them. The types of comments written on the rubrics for the first draft of the Opinion essay are summarized in Table 2. This represents rubric comments for 13 students in three different classes in our sample. The rubric itself was counted as one piece of feedback, and each additional written comment was added to the count. We do not report the rubric feedback for the Comparative essays because it appears that at least two of the teachers provided these via Schoology to which we did not have access.

**Table 2: Frequencies and Percentages of Teacher Feedback Categories for Opinion Essay Rubrics**

Category of feedback	Opinion Essay	
	Frequency	%
6-item rubric	13	33%
Structure	8	20%
Encouragement	8	20%
Persuasiveness	3	8%
Variety	2	5%
Clarification	2	5%
Elaboration	2	5%
Miscellaneous	2	5%
<b>Total</b>	<b>40</b>	<b>100%</b>

### Feedback provided by peers

Google Docs facilitated peer review of the Comparative essays and the following peer feedback was identified in the first drafts of three of the 20 students in our sample. Table 3 summarizes the nature of these comments.

**Table 3: Frequencies and Percentages of Peer Comments by Category**

Category of feedback	Comparative Essay	
	Frequency	%
Encouragement	8	57%
Structure	4	29%
Basic writing errors	1	7%
Critical thinking	1	7%
<b>Total</b>	<b>14</b>	<b>100%</b>

### Conclusion

Teachers provided ongoing, substantial, and varied types of feedback on student essay work, mostly in the form of encouragement, attention to structure of writing, and corrections of basic writing errors. Fewer comments were provided for the end of year Comparative essays compared with the mid-year Opinion essays. It appears that this was partly intentional as teachers reduced their focus on the technicalities of writing and shifted attention to more conceptual issues, and partly induced by teachers' inability to mark up electronic text in the same way as paper-based text.

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## EXHIBIT 7

### Phase II School Student Technology Readiness Survey

#### Grades 3-6

#### Background information and Access to Technology at Home:

1. Please select your school (list all middle schools)
2. Please select your grade level.
3. Which of the following are you currently allowed to use at home (check all that apply)
  - a. Desktop
  - b. Laptop
  - c. Tablet (e.g., iPad, Microsoft Surface, Samsung, Kindle Fire)
  - d. Internet
4. Do you have a laptop you think you would be allowed to bring to school everyday?
  - a. Yes
  - b. No
5. If so, what model is this laptop (check all that apply).
  - a. Chromebook
  - b. MacBook Air
  - c. MacBook Pro
  - d. Windows Surface
  - e. Other
  - f. Don't know what kind it is
6. Do you have a tablet you think you would be allowed to bring to school everyday
  - a. Yes
  - b. No
7. If so, what model is this tablet?
  - iPad
  - Microsoft Surface
  - Samsung
  - Kindle Fire
8. Do you have access to the Internet at home?
  - a. Yes
  - b. No
9. How many days a week are you using your device for? (1 day, 2 days, 3 days, 4 days 5 days)?

10. How many times a day are you using your device?
  - a. (1, 2, 3, 4 or 5 times)?
  
11. In which subjects are you using the following apps (check all that apply)?
  - a. Math
  - b. English
  - c. Science
  - d. Social studies
  - e. Music
  - f. Art
  - g. Physical education

#### Top apps - iPad

1. Educreations (screen recording device to replay work performed)
2. iPad Camera (documentation of work)
3. Gmail (e-mail)
4. Safari (web browser)
5. Chrome (web browser)
6. RAZ-Kids (literacy)
7. Google Maps (mapping)
8. Google Drive (file storage and document sharing)
9. Schoology (access, sharing and presentation of content, threaded discussions, assessments)
10. Google Earth (global mapping)
11. Nearpod (presentation of content and progress monitoring)
12. Google QuickOffice (real-time sharing of word processing documents and spreadsheets)
13. Screen Chomp (screen recording)
14. Skype (teleconferencing)
15. IXL (math)

#### Top apps - Chromebook

1. Schoology
2. Chrome
3. Google QuickOffice (e.g., Google Docs, Google Sheets)
4. Google Drive
5. Chromebook Built-In Camera
6. Gmail
7. Newsela
8. Google Maps
9. Google Earth
10. Nearpod

11. Skype
12. Khan Academy
13. Desmos Graphing Calculator
14. Diigo
15. YouTube

**Student validation of change in teacher practice questions:**

**Personalized Learning**

1. Since school started, how many times did you choose a project topic you wanted to work on? (never, one time, more than one time)
2. Last week, how often did you work in small groups during class time? (every day, most days, some days, once, not at all)
3. Last week, how often did you work with your teacher by yourself during class time? (every day, some days, once, not at all)
4. How often do you get the opportunity to move faster on a topic that you find easy? (every day, some days, once, not at all)
5. How often do you get the opportunity to spend more time on something you find hard? (every day, some days, once, not at all)

**Quality Feedback**

6. This school year, has any of your school work been shared using technology (such as on the Smartboard or through Schoology) with (check all that apply):
  - a. Your entire class
  - b. A small group of classmates
  - c. Other students not in your class
  - d. Your family
  - e. An outside expert (such as an author or scientist)
7. Did anyone in this audience give you useful feedback (check yes/no by audience)
8. This school year, how often have you provided feedback to your classmates on their work that has been shared with you using technology (e.g., on a Smartboard, laptop, tablet or through Schoology)? (every day, most days, some days, once, not at all)

9. This school year, when you are working on the first draft of a writing assignment, what is the first time you receive comments from your teacher on work? (while I am writing it, within one week of handing it in, one to two weeks of handing it in, more than two weeks after handing it in)
10. Since the start of the school year, for how many assignments has your teacher given you a rubric before starting the assignment so you understand how it will be graded? (all, most, some, a few, none)

### **Self-Regulated Learning**

11. This school year, how many pieces of work have you saved in a digital work portfolio? (lots, some, a few, none)
12. This school year, when explaining an assignment to you, has your teacher provided you with examples of other students' work to help you understand what is expected? (never, sometimes, often)
13. This school year, has your teacher asked you to review your own work and write down your comments on how you could make it better? (every day, most days, some days, once, not at all)

### **Critical Thinking of On-Line Content**

14. If you are asked to search for a topic online for your school work, how many different web sites do you usually look at?  
(circle one)
  - a. First one that comes up
  - b. Between 2 and 5
  - c. 6-10
  - d. More than 10
15. If you look at more than one web site to gather information on a single topic for school work, how do you choose what information to use for your assignment?  
(circle one)
  - a. Use information from one web site only that you think is the best source
  - b. Combine information from all the web sites
  - c. Combine information only from web sites where you feel confident the authors are giving accurate information

16. When searching online for information related to your schoolwork, how easy do you find it to judge whether a web site is a source that you can trust to be accurate?

*(circle one)*

- a. Always difficult
- b. Sometimes difficult
- c. Usually easy
- d. Always easy

17. When searching for information related to your schoolwork, how often do you come across web sites that you feel might not be giving you accurate information?

*(circle one)*

- a. Often
- b. Sometimes
- c. Never

18. Over the last 2 weeks, how often have you used the following ways of communicating an idea or information about your schoolwork, or a finished product, to your peers, teachers, or family:

(Check one for each item:            Never            Once            A couple times            3-5  
times    More than 5 times )

- a. Audio recording:
- b. Video recording:
- c. Digital photo:
- d. Digital drawing:
- e. Email:
- f. Text message:
- g. Digital presentation (e.g., using XXXX, YYYY or ZZZZ software):
- h. Wiki:
- i. Class or school web site:

**Thank you so much for taking the time to complete this survey.**



## Fox and Pirate who tried to Capture the moon

By [Antonia](#)

Fox and the pirate who tried to Capture the moon. Fox wants to capture other peoples friends, and Pirate wants to capture everything and the moon too. Both Fox from the book Fox and Pirate from the book The Pirate who tried to Capture the moon get what they want. You are lonely so they want them to feel how they felt beeing lonely, but sometimes you feel bad about what you did and return the things you took from other people or their community.

In the book Fox, Fox wants to capture Magpie to be his friend. He tries to separate Magpie and Dog. Fox got what he wanted, he separated Dog and Magpie, he said to magpie that he is faster than dog so magpie says "This is nothing like flying nothing" so he went with Fox and then he leave her in the dessert and says "Now you and dog will know how is like to be truly alone". So Fox got to separate them. This paragraph connects to real life because you learn a lesson that is don't leave your friends because they are bad in something and go with the one is better because they could leave you alone and you won't have friends because you left your friend for a better thing.

In the book The Pirate who tried to Capture the Moon, Pirate captures everything the moon loves and everything in his island slowly, the Pirate who loved nothing moved over to the land in his ship looking for everything the moon loved, "surrounded by the sea he watch for ships to capture" then he looked at the sky and so the moon so he said "Someday, Moon I'll capture you too". When he captured everything he was happy but the only thing he needed was to capture the moon but then he felt bad about everything he did so he returned everything he took. This paragraph connects in real life because becaus eyou learned the lesson that don't take everything to get what you want it's better to ask for it and that is part of the world so you should return and keep the world like that.



Selected text  
One way the stories are different is that Pirate  
This paragraph is showing us another way the  
books are similar. Both characters love no one. You  
could write the paragraph about how they are similar  
in this way.

They also both captured things and let them go. You  
have evidence for this also.

Decide what you want to do, and let me know.  
Reply

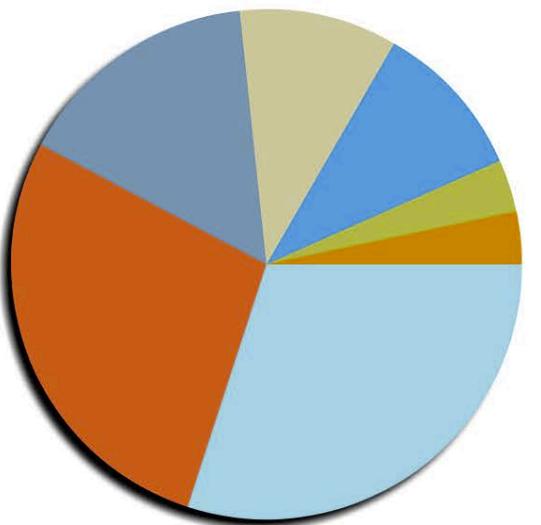
**antonia** Marked as resolved  
9:57 AM Jun 1

Adding a comment will re-open this



**Denise Cartol** 3:30 PM May 31 - Re-open  
Selected text  
"Don't take everything the moon/likes or  
This does not teach a real life lesson because  
nobody is really going to try to capture the moon. A  
lesson has to relate to EVERYONE. You need to

### Student usage - time spent by category



- Multiply decimals
- Geometry
- Number theory
- Place values and number sense
- Patterns and sequences
- Ratios, proportions, and percents
- Probability and statistics

### Skills practiced

Rank ▲	Skill	Time spent	Problems attempted	SmartScore <sup>?</sup>
1	<input type="checkbox"/> G.6 Multiply money amounts: word problems	0 hr 27 min	17	82 (good)
2	<input type="checkbox"/> K.2 Prime factorization	0 hr 11 min	28	100 (mastered)
3	<input type="checkbox"/> B.7 Classify quadrilaterals	0 hr 10 min	54	87 (good)
4	<input type="checkbox"/> A.1 Place values	0 hr 9 min	21	73 (satisfactory)
4	<input type="checkbox"/> B.1 Identify 2-dimensional and 3-dimensional shapes	0 hr 9 min	50	100 (mastered)
4	<input type="checkbox"/> T.1 Geometric growth patterns	0 hr 9 min	30	100 (mastered)
7	<input type="checkbox"/> B.15 Perimeter	0 hr 5 min	9	40 (needs improvement)
8	<input type="checkbox"/> K.1 Prime and composite numbers	0 hr 3 min	29	100 (mastered)
8	<input type="checkbox"/> V.1 Determine the ratio	0 hr 3 min	15	78 (satisfactory)
8	<input type="checkbox"/> Y.5 Make predictions	0 hr 3 min	14	69 (needs improvement)

EXHIBIT 9

District Meeting and Professional Learning Days 2015-2016 - DRAFT

Type	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Faculty Meetings		2 <u>Faculty</u>	7 <u>Faculty</u>	Nov. 3 District Full PL Day  Personalizing Instruction & Universal Design for Learning (UDL)	2 <u>Faculty</u>	6 <u>Faculty</u>	3 <u>Faculty</u>	2 <u>Faculty</u>	6 <u>Faculty</u>	4 <u>Faculty</u>	1 <u>Faculty</u>
		9 <u>Program</u>	14 <u>Program</u>	4 <u>Faculty</u>	9 <u>Program</u>	13 Early Release: Critical Thinking of Online Content	10 Winter Break	9 Early Release: Personalized Learning	13 Spring Break	11 Early Release: Teachers Sharing with Teachers (EdCamp)	8 <u>Program</u>
		16 Early Release: Quality Feedback and Collaboration	21 Early Release: Quality Feedback and Learning Assessments	11 <u>Program</u>	16 <i>IDT Program IDT</i>	20 <u>Program</u>	17 <u>Program</u>	16 <u>Program</u>	20 <u>Program</u>	18 <u>Program</u>	15 <i>IDT Program IDT</i>
Scheduled ERD and IDT		30 Teacher Choice	28 <i>IDT Program IDT</i>	18 <i>IDT Program IDT</i>	23 Early release for Holiday	27 <i>IDT Program IDT</i>	24 <i>IDT Program IDT</i>	23 <i>IDT Program IDT</i>	27 <i>IDT Program IDT</i>	25 <i>IDT Program IDT</i>	22 Teacher Choice
Other	Aug. 31 District Full PL Day Introduction to your Blended Learning Classroom			25 Early release for Holiday	Holiday Break						

## EXHIBIT 10

### GPS DLE Teacher Technology Readiness Survey

Improve, LLC in collaboration with Teachers College, Columbia University is collecting baseline data from teachers, principals and students in support of the GPS Digital Learning Environment (DLE) implementation. There are four purposes of this teacher technology readiness survey:

1. To educate teachers on the overall goals of the DLE and the shifts in practice we hope to accomplish with the introduction of technology
2. To take a baseline measurement of teacher technology readiness so we can show progress in June based on the professional learning teachers receive this year
3. To provide a training needs analysis to help us personalize training for groups of teachers on applications in the Digital Toolbox
4. To identify best practices currently in the district

Since we have not implemented the DLE, we do not expect you to have reached the educational goals described in this survey (much like your students will not have mastered concepts when taking a unit pre-test). Please answer the following questions based on your current experience and skill levels. We will be issuing this survey again in June to understand whether the DLE is succeeding in reaching our educational goals.

The survey should take between 10 and 20 minutes to complete. Your answers will be saved if you leave the survey during completion. You can return to the survey by clicking on the link in this e-mail. Please complete the survey by Friday, November 15.

The survey will not be used in any way for teacher evaluation.

Your honesty and feedback are greatly appreciated.

***Five teachers completing a survey by November 15 will be selected randomly to receive a \$25 iTunes card.***

Background information:

1. Please select your school: **(all elementary schools listed)**
  2. Please select your grade level(s). Circle all that apply. **(prek, K, 1, 2, 3, 4, 5, all)**
  3. Do you currently have either a district-provided or personal iPad? **(yes, no)**
  4. If you have an iPad, how long have you had it? **(less than a year, 1-2 years, 3 years)**
- 
1. Since the beginning of school year 2013-14, has your principal communicated the following district goals on how technology can support teaching and learning? **(yes, no)**

- Students will demonstrate critical thinking of on-line content
  - Students will demonstrate self-regulated learning
  - Students will receive quality feedback on their work
  - Learning will be more personalized for students
  - Student will be ready to take the SBAC
2. During the last school year (2012-13), how frequently did you share work samples with other teachers on-line? (**Once per week, monthly, once per marking period, 1-2 times/year, not sharing**)
  3. If yes, where, (e.g., **Wikispace, Google drive, shared network drive, Edmodo, Schoology, other \_\_\_\_\_**)?

We have defined skills and changes in practice required to achieve the district educational goals for the digital learning environment. We do not expect you to have reached these goals until you receive professional learning, although some teachers may be achieving these changes in practice on an individual basis. For each goal, please answer the following questions:

*Scale: (Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day)*

Critical Thinking for On-line Content

1. For this school year (2013-14) as of today, how frequently have your math lessons required students to:

- **Define a problem:**

- Define a problem through identifying term definition, facts and other relevant information using an appropriate on-line resource (e.g., outside experts, websites, search engines)

*(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable/Don't Teach Math)*

- **Locate Information:**

- Locate a variety of online sources to help solve a real world problem

*(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable/Don't Teach Math)*

- **Evaluate Information:**

- Find and evaluate online content to answer empirical questions

*(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable/Don't Teach Math)*

- **Synthesize Information:**

- Develop an understanding of real world problems using current information on-line

*(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable/Don't Teach Math)*

- **Communicate Information:**

- Communicate information to specific audiences in an effective and coherent manner
- Use multiple means of representation such as audio, video, image and text

*(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable/Don't Teach Math)*

2. Self-Regulated Learning

For all subject areas, how frequently do your students:

- Create and store their work in a digital work portfolio?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Document and reflect on their work at multiple points throughout completion of the work process
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Co-create rubrics with you, collaborating to define expectations and elements of quality work?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Receive exemplars of quality work, reflections and iterations, including work from previous students?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*

- Self-assess and reflect on learning as part of their responsibility for learning
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*

3. Provide quality feedback

How frequently:

- Do you use digital resources to embed feedback in student work that is still in process (E.g., on Google Drive using forms, or on Schoology)?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do you use a wide range of formative assessments to gain deeper insight into student needs and understanding, and to provide immediate feedback, correct misconceptions and challenge the thinking of each student?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do you provide students with assessment criteria and individualized descriptive feedback to help them improve their performance and assume responsibility for their learning?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do you support students' progress by communicating academic and behavioral performance expectations and results with students, their families and other educators;
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do students have an opportunity to publish their work for peer reflection and support?
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do students have an opportunity to publish their work for parents?

- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Do students have an opportunity to receive feedback on independent work?
  - teacher-to-student
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
  - student-to-student
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
  - field expert-to-student
- *(Never, 1-2 times/year, at least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*

4. Personalized learning

How frequently do:

- Students work in small groups or individually in situations that allow you time to walk around and work directly with individual students?  
*(Never, At least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Instruction is responsive to students' choice and interests  
*(Never, At least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Students are able to work at their own pace to master skills and knowledge  
*(Never, At least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Students participate in on-line threaded discussions where students help facilitate and all students are more likely to participate?  
*(Never, At least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*
- Is technology used to automate provision and tracking of individual learning plans personalized for each student's goals and skill levels (e.g., RAZ-Kids, RTI studio)?  
*(Never, At least once a marking period, At least once a month, At least once a week, at least once a school day, Not Applicable)*

5. Readiness for SBAC)

- Have you taken any practice SBAC tests to familiarize yourself with the platform? **(Yes, No)**
- Have your students taken any practice SBAC tests? **(Yes, No)**

- Have you received training on the SBAC navigational control functions (e.g., use of function keys on the test)? **(Yes, No)**
  - Have your students received instruction on how to navigate within the SBAC platform, e.g., use of the split screen, use of the function keys? **(Yes, No)**
  - Do you believe your students will know when to ask for help if they run into a technical problem on the SBAC? **(Yes, no, maybe)**
6. How optimistic are you that technology integration can achieve learning goals for your students? **(1 very optimistic 2, 3, 4, 5 not at all optimistic)**
  7. To what extent do you feel technology integration will impact your ability to manage your time with individual students **(give me more time, about the same amount of time, give me less time)**?
  8. How confident are you in your current ability to integrate technology to support the learning goals above? **(1very confident, 2, 3, 4, 5 not at all confident)**
  9. In your opinion, how confident do you feel compared to the other teachers in your school in your current ability to integrate technology to support learning goals above? **(1very confident, 2, 3, 4, 5 not at all confident)**
  10. I am satisfied with the level of technology support provided to me in my classroom. **(Strongly agree, agree, neutral, disagree, strongly disagree).**
  11. If you disagreed or strongly disagreed with the prior question, please briefly explain why not **(open-ended response).**
  12. Please describe any best practices in your use of technology with your students to elevate instruction that you would like to share. Your example does not have to be a big project, but could be one simple example. Please let us know if we can follow up with you to learn more about your exciting work **(open-ended response).**

Please rate your skill level with the following applications:

- No experience – I have never used this application.
- Novice – I feel comfortable using a few features/functions of this application
- Intermediate – I am comfortable using this application in the classroom, but there are many features I have not fully explored.

- Advanced –I know short cuts and most/all the features of this application. My co-workers come to me for help on this application.

## Digital Toolbox

### Schoology

- Assignments
- Assessments
- Bulletin Board
- myResources
- Groups
- ePortfolio

### Web-Based Search and Curation

- Chrome
- Safari
- Diigo

### Google Apps

- Google Maps
- Google Earth
- Google Drive
- Google Quick Office (docs, sheets, slides)
- Forms
- Gmail
- Calendar
- Sites

### Productivity

- Evernote
- Skitch
- iWork
- Skype

### Multi-Media Creation

- iMovie
- iPad camera
- Screen Chomp (Screencasting: K-1)
- Educreations (Screencasting: Gr 2-3)
- Touchcast
- Garageband

- Voice Thread
- Puppet Pals
- Dragon Dictation

#### Research

- Destiny Quest

#### Literacy

- iBooks
- Subtext
- Myon
- RAZ-Kids
- Follett Enlight
- Spelling City
- ABC Pocket Phonics

#### Math

- Wolframalpha.com
- Khan Academy
- Think Central
- IXL

#### Progress Monitoring

- Running Records
- Class Dojo (PS)
- Nearpod

**Thank you so much for taking the time to complete this survey.**