Instructional Technology Evaluation
Sample District Schools

November 2012

Sun Associates

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Executive Summary

When asked what students should know and be able to do with regard to the use and integration of technology, a group of key administrators in Sample District Schools developed a response that centers around the key skills of communication, collaboration, critical thinking and creativity. The central indicator for effective technology integration emphasizes the need for students to be self-directed learners who can innovate and work together to solve problems in all content areas. As such, Sample District's indicators align well with other national standards and frameworks ranging from the Common Core for Learning to the ISTE National Educational Technology Standards (NETS), and the Framework for 21st Century learning. In fact, the ISTE NETS frameworks for students, teachers, and administrators serve as a strongly aligned, and more detailed, set of performance indicators for Sample District's technology integration efforts. By aligning its vision for technology's role in teaching and learning with these national standards, Sample District Schools is making a significant statement about the type of learning that it wishes for its students and the role that technology will play in supporting that environment.

In looking at Sample District schools, the evaluators are at first impressed by an abundance of new physical facilities and a community that is clearly proud of how it has grown and developed its schools to support the rapid and dynamic population expansion in the area. Further, the evaluators find that within these schools work dedicated teachers and administrators who clearly have the best interests of their students foremost in mind. When one learns of the economic stresses faced by the community – and the schools specifically – in recent years, the continued good work of the teachers, and the resulting pride from the local community, is all that much more impressive.

In classrooms across the district, the evaluators saw technology being used to support a variety of instructional activities. In many places, teachers were observed using 3M boards to project materials such as worksheets and videos, including those from online sources such as YouTube or Discovery. In other places, teachers were using document cameras to project paper-based materials on the classroom whiteboard. Students were occasionally called to write on the white board, but for the most part, these activities were largely teacher-directed, whole-class, activities in which the technology functioned as a presentation tool in the hands of the teacher.

The evaluators also observed students using lab computers (including the STEM labs in the junior high schools) to participate in various computer based instruction (CBI) activities, typing papers, or conducting Internet-based research. Students were observed in some cases using devices such as calculators to solve problems and a variety of equipment and probe ware in their science classes. A number of classes across the district were seen using "clickers" as input devices during teacher-conducted multiple choice tests/quizzes. The evaluators were told that there is a Bring Your Own Device (BYOD) pilot project operating in the high schools that has grown out of the district's recent adoption of a policy that allows the student use of personal technology devices in school. Several high school teachers were interviewed about their work with the pilot initiative. Also, the evaluators learned that several elementary schools have started their own iPad projects supported largely with parent-generated funding.

While some amount of technology use – mostly by teachers - was observed throughout the district, the evaluators' consistent finding is that there is a lack of clear communication and understanding at the building and district level about technology's role in teaching and learning. In other words, the vision expressed by the district's evaluation committee is not one that is familiar to the teachers and administrators in Sample District, nor does it function as an organizing principle for district actions. With little communication about the direction that the district wants to move with regard to technology integration, practitioners in the district are largely on their own to make use of the resources they find available. In the majority of cases, this has resulted in little connection being made at the classroom level between the use of technology and the creation of collaborative, creative, inquisitive, self-directed learners.

In order for Sample District Schools to realize its vision for technology-supported teaching and learning, it must exercise the leadership to establish policies, make decisions, and develop action plans in accordance with that vision. The evaluators recommend that the district convene a team of upper level administrators, principals, teachers, curriculum consultants, and other district stakeholders who can coordinate efforts across initiatives and areas of expertise to develop strategies for supporting students in the development of the learning skills and dispositions reflected in the Common Core for Learning and NETS. The initial focus for this committee's work should be to create the district wide strategic technology plan that includes goals related to professional development, instructional technology staffing, infrastructure, and student technology and media literacy skills.

With a truly strategic plan that involves the input of all district stakeholders and that addresses technology as a cross-cutting initiative, it will become possible for the district to generate support for acquiring the tools, resources and supports that teachers and students require to meet the demands of the Common Core as envisioned in the ISTE NETS. While it is quite clear that Sample District's teachers and students need access to updated computers, new systems for communication and collaboration, and most importantly, improved instructional technology staffing, it is still the evaluators' basic finding that Sample District's largest challenge related to being able to realize its vision for technology is a need for the leadership and communication that will enable the district to marshal the support to acquire resources. Sample District needs to build trust in its community of teachers, administrators, parents and ultimately the broader community that there *is* a vision, that it *is* transformative, and that the district has the ability to reach its vision. The creation of a strategic plan that has as its mission the communication of that vision will be a solid first step in that direction. The evaluators believe that Sample District can do this, and look forward to continuing to assist with that effort.

I. Introduction

This evaluation report is designed to serve several purposes for Sample District Schools. At its most basic level, the data herein exists as a record of the "current status" of instructional technology integration within the district. This current status provides an essential baseline for the instructional technology strategic planning effort that will transpire in the coming months and will be incorporated into the technology plan itself. Equally important, the findings and recommendations contained in this report are intended to fuel a lively discussion and priority-setting process related to technology's role in teaching and learning in Sample District schools. This discussion is a key part of generating the technology plan itself, and of framing the plan within the context of the broader issues of teaching and learning in the district. Given the overlap and shared emphasis of initiatives such as the Common Core, 21st century learning, and technology integration, this evaluation offers insight into a more comprehensive set of issues than simply the use of technology, and keeps pace with current educational practice and research around the use of technology within a student-centered educational environment that encourages the development of essential thinking and lifelong learning skills.

Methodology

Indicators and Data Collection

The following report presents data and findings related to how Sample District Schools teachers and students use technology to support learning in line with a set of visionary performance indicators created by the district. These indicators are shown in Figure One, below. As can be seen, these indicators exist in five basic domains – Student Skills/Outcomes, Teacher Skills/Pedagogy, District Policy and Administration, Infrastructure, and Community. These domains frame the basic areas of investigation of Sample District's instructional technology evaluation. In order to determine the district's performance within each of these areas, the evaluators collected about teacher, administrator, parent, and student work, beliefs, and attitudes related to the indicator in each category. Analysis of the collected data resulted in a set of findings, presented in the next chapter, and ultimately considered against the evaluators' knowledge of relevant educational research and best practice. The resulting recommendations are reported in the final chapter of this report.

Sample District's evaluation indicators were developed with a committee of district stakeholders (see list of committee members in Figure Two) in August 2012. This meeting, as well as the overall evaluation process and work, has been facilitated by Sun Associates, an external educational program evaluation firm with specific expertise in instructional technology evaluation and planning. Subsequent to the indicator development, the evaluators created a range of data collection instruments (see Appendix) such as surveys, interviews and observation protocols. These instruments were utilized for data collection that ran between early September and the middle of October, 2012. Central to the data collection were five days in which Sun Associates evaluators were in-district visiting schools. In all, the evaluators conducted detailed in-person classroom observations in 20 of the district's 22 schools.[1] The

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[1] The two schools that were not visited were Liberty and Wydanot Early Childhood centers. Nevertheless, the principals from both of these schools were email interviewed, teachers from these schools were included in the evaluators' focus groups, parents were in the parent focus groups, and teachers responded to the online teacher survey.

evaluators also conducted teacher, parent, school board, and administrator focus groups, and principal interviews in every building. The evaluators visited every classroom in each of the 20 buildings, and recorded observations in a large number of classrooms (approximately 170 total across the district) in each building. In addition to the in-person data collection, the evaluators also administered teacher, parent, student and community member online surveys. Figure Three shows the *n* values for data collected in all categories from all Sample District schools.
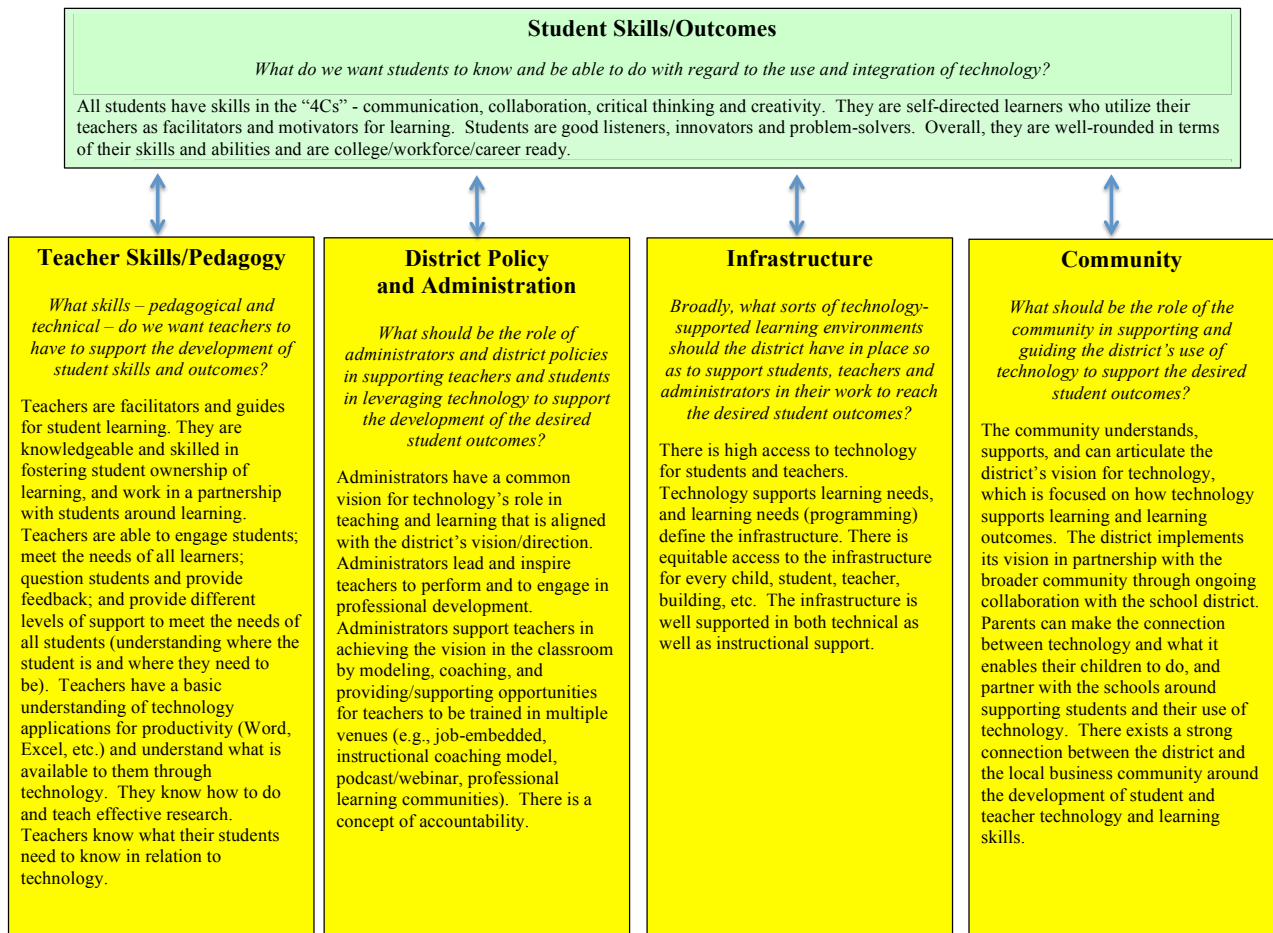
Student Skills/Outcomes

What do we want students to know and be able to do with regard to the use and integration of technology?

All students have skills in the "4Cs" - communication, collaboration, critical thinking and creativity. They are self-directed learners who utilize their teachers as facilitators and motivators for learning. Students are good listeners, innovators and problem-solvers. Overall, they are well-rounded in terms of their skills and abilities and are college/workforce/career ready.

Teacher Skills/Pedagogy	District Policy and Administration	Infrastructure	Community
What skills – pedagogical and technical – do we want teachers to have to support the development of student skills and outcomes?	*What should be the role of administrators and district policies in supporting teachers and students in leveraging technology to support the development of the desired student outcomes?*	*Broadly, what sorts of technology-supported learning environments should the district have in place so as to support students, teachers and administrators in their work to reach the desired student outcomes?*	*What should be the role of the community in supporting and guiding the district's use of technology to support the desired student outcomes?*
Teachers are facilitators and guides for student learning. They are knowledgeable and skilled in fostering student ownership of learning, and work in a partnership with students around learning. Teachers are able to engage students; meet the needs of all learners; question students and provide feedback; and provide different levels of support to meet the needs of all students (understanding where the student is and where they need to be). Teachers have a basic understanding of technology applications for productivity (Word, Excel, etc.) and understand what is available to them through technology. They know how to do and teach effective research. Teachers know what their students need to know in relation to technology.	Administrators have a common vision for technology's role in teaching and learning that is aligned with the district's vision/direction. Administrators lead and inspire teachers to perform and to engage in professional development. Administrators support teachers in achieving the vision in the classroom by modeling, coaching, and providing/supporting opportunities for teachers to be trained in multiple venues (e.g., job-embedded, instructional coaching model, podcast/webinar, professional learning communities). There is a concept of accountability.	There is high access to technology for students and teachers. Technology supports learning needs, and learning needs (programming) define the infrastructure. There is equitable access to the infrastructure for every child, student, teacher, building, etc. The infrastructure is well supported in both technical as well as instructional support.	The community understands, supports, and can articulate the district's vision for technology, which is focused on how technology supports learning and learning outcomes. The district implements its vision in partnership with the broader community through ongoing collaboration with the school district. Parents can make the connection between technology and what it enables their children to do, and partner with the schools around supporting students and their use of technology. There exists a strong connection between the district and the local business community around the development of student and teacher technology and learning skills.

Figure One – Sample District's indicators.

– Superintendent
– Asst. Superintendent
– Director of Technology
– Director of Special Services
– Director of Business Operations
- Administrative Consultant
– Teacher
-- Principal
– Curriculum Director
– School Board Member

Figure Two – Evaluation Committee members.

School	Teacher Surveys	Parent Surveys	Student Surveys	Class Observs	Principal Interview	Teachers in FG	Parents in FG
Sample District East High School	64	30	0	7	yes	3	7
Sample District A. Freshman	20	16	na[2]	4	yes	na[3]	na
Sample District West High School	51	30	22	9	yes	4	1
Sample District B. Freshman	20	20	na	12	yes	na	na
MS1. School	15	14	25	18	yes	2	5
MS2 School	30	12	27	5	yes	2	
MS3 School	21	15	26	6	yes	2	2
MS4 School	16	10	21	6	no[4]	2	
A. Elementary (2-6)	40	14	17	9	yes	3	
B. Elementary (2-6)	47	3	21	10	yes	3	
C. Elementary (2-6)	25	3	22	7	yes	2	1
D. Elementary (2-6)	29	14	25	16	yes	2	1
E. Elementary (2-6)	25	17	27	11	yes	2	
F. Elementary (2-6)	21	16	0	7	yes	1	1
G. Elementary (2-6)	38	14	38	9	yes	1	1
H. Elementary (2-6)	41	14	0	9	yes	1	1
I. Elementary (2-6)	22	16	23	5	yes	0	1
J. Elementary (2-6)	30	5	32	2	yes	1	
A. Early Childhood (P-1)	19	6	na[5]	8	yes	2	
B. Early Childhood (P-1)	25	3	na	na[6]	na	2	
C. Early Childhood (P-1)	8	5	na	6	yes	1	
D. Early Childhood (K-1)	16	6	na	na	yes[7]	2	2

[2] Only 12th grade students were surveyed at the high school level.

[3] 9th grade high school teachers were included in the high school teacher focus group.

[4] A follow-up attempt was made to interview this principal via email, but no response was received.

[5] Early childhood school students were not asked to take the online student survey.

[6] B. and D. Early Childhood were the only two schools not visited in person.

Background to the Indicators

The ISTE NETS-S Standards

The current Sample District Schools technology evaluation has at its core a set of standards developed by the International Society for Technology in Education (ISTE) known as the National Education Technology Standards (NETS). Widely adopted in the United States, and increasingly recognized worldwide, the ISTE NETS integrate educational technology standards across all educational curricula and at all levels of the educational organization. At the classroom level, the NETS present a transformed view of teaching and learning with a unique set of standards outlined for students, teachers, and technology specialists. Additional standards exist for outlining the skills and knowledge that school administrators and other district leaders need in order to support the integrated use of technology and transform education in the way that the NETS-S (students) and NETS-T (teachers) describe.

The NETS-S standards are:[8]

1.Creativity and Innovation
> Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

2. Communication and Collaboration
> Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

3. Research and Information Fluency
> Students apply digital tools to gather, evaluate, and use information.

4. Critical Thinking, Problem Solving, and Decision Making
> Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

5. Digital Citizenship
> Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

6. Technology Operations and Concepts
> Students demonstrate a sound understanding of technology concepts, systems, and operations.

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[7] Via email.
[8] The full text of the NETS-S standards, as well as the complementary NETS-T and NETS-A standards, are provided in the Appendix to this report.

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ISTE has also created a set of <u>teacher</u> technology standards – NETS-T – that exist in parallel to the student standards (NETS-S). While the main effort in Sample District's evaluation is to determine the extent to which students participate in experiences that support NETS-S related learning outcomes, it is clear that teachers need to meet the NETS-T standards if they are to facilitate the type of learning reflected in NETS-S. Therefore, the evaluators examined teacher attitudes towards the use of technology to achieve particular types of student learning experiences.

The NETS-T standards are:

1. Facilitate and Inspire Student Learning and Creativity
Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

2. Design and Develop Digital Age Learning Experiences and Assessments
Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

3. Model Digital Age Work and Learning
Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

4. Promote and Model Digital Citizenship and Responsibility
Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

5. Engage in Professional Growth and Leadership
Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

In the context of Sample District's technology audit, the NETS S standards constitute an ideal against which the data is compared. As such, this section of the audit evaluation report provides some detail on the background context and implications of the NETS standards. This discussion is intended to then provide the basis – when considered in light of the data collected – for the recommendations found in Chapter III of this report.

Background to the NETS Standards[9]

ISTE NETS are clearly built upon current accepted standards of accomplished teaching and leadership. Although the standards include the necessary technology components, they also are grounded in application of technology as it supports sound pedagogical theory and practice. All of the ISTE standards prepare teachers, administrators, and technology specialists to provide the environments, experiences, and resources that will help P-12 students effectively apply technology for learning, communications, problem-solving and decision-making.

The ISTE standards for teachers, technology leaders, and administrators all are designed to support the development of technology-capable P-12 students, who must, in today's world, become:

- Capable information technology users,
- Information seekers, analyzers, and evaluators,
- Problem-solvers and decision-makers,
- Creative and effective users of productivity tools,
- Communicators, collaborators, publishers, and producers, and
- Informed, responsible, and contributing citizens. (NETS, 1998)

Technology applied appropriately throughout the schooling process can provide educators with strong support for preparing students to achieve these goals. The ISTE standards support the development of technology-capable students through the application of constructivist learning theory as described in six principles of constructivism identified from literature review by the ATRL Project team (Dimock, V., Southwest Educational Development Laboratory, 2000)

- Learners bring unique prior knowledge, experience, and beliefs to a learning situation.
- Knowledge is constructed uniquely and individually, in multiple ways, through a variety of authentic tools, resources, experiences, and contexts.
- Learning is both an active and reflective process.
- Learning is a developmental process of accommodation, assimilation, or rejection to construct new conceptual structures, meaningful representations, or new mental models.
- Social interaction introduces multiple perspectives through reflection, collaboration, negotiation, and shared meaning.
- Learning is internally controlled and mediated by the learner.

These constructivist principles provide a context for the integration of technology to support learning in powerful ways. The following diagram, included in all ISTE standards documents, illustrates movement from application of traditional learning strategies, to strategies aligned closely with constructivist learning principles. The strategies identify observable characteristics of constructivist learning environments that can be facilitated with technology.

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[9] The following is excerpted from an ISTE publication and provides further detail and context for the student, teacher, and administrator NETS standards.

Traditional Learning Environments		New Learning Environments
Teacher-centered instruction	→	Student-centered learning
Single sense stimulation	→	Multisensory stimulation
Single path progression	→	Multipath progression
Single media	→	Multimedia
Isolated work	→	Collaborative work
Information delivery	→	Information Exchange
Passive learning	→	Active/exploratory/inquiry- based learning
Factual, knowledge-based learning	→	Critical thinking and Informed decision-making
Reactive response	→	Proactive/planned action
Isolated, artificial context	→	Authentic, real-world context

Figure Four – Establishing new learning environments and incorporating new strategies.

Although the strategies for the new learning environments described do not specifically denote use of technology, it is clear that technology can very effectively support the implementation of these strategies. All of the ISTE standards and curriculum integration materials focus on building new learning environments that use technology to support research-based strategies to improve student learning.

Apple Classrooms of Tomorrow (ACOT) – Another Lens

Whereas the ISTE NETS offer a powerful, specific, vision for *what* students and teachers can do with technology within the learning environment, there is another tool that offers a useful lens through which one can view the *process* by which teachers adopt technologies. This is the well-regarded ACOT framework. [10] ACOT is based on over ten years of wide-scale, field-based, research on how teachers make use of instructional technology within their practice. The evaluators find it useful to consider the ACOT framework as a way of understanding different levels of teacher experience and for examining the processes by which teachers progress from lower levels to higher levels of technology use.

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[10] Apple Computer, 1996

The ACOT framework is as follows:

Stage	Teacher Behavior/Example
Entry	Teachers learn the "basics" of using new technology
Adoption	Teachers use new technology to support traditional instructional methods such as lecturing, presentation, presenting/creating electronic versions of worksheets.
Adaptation	Teachers integrate new technology into traditional classroom practice, focusing on increased student productivity and engagement through the use of tools such as word processors, spreadsheets, and graphics tools.
Appropriation	Teachers focus on cooperative, project-based and interdisciplinary work which incorporates technology as needed and as one of many tools.
Invention	Teachers discover new uses for technology tools often by designing projects that combine multiple technologies.

Figure Five – ACOT stages of teacher adoption of technology. *From "A Report on 10 Years of ACOT Research" (Apple Computer, 1996)*

When documenting actual teacher behavior related to technology use, it becomes possible to place this behavior within the ACOT framework. The advantage of using a conceptual framework such as ACOT's levels of teacher appropriation is that it places current teacher behavior in contrast to other ways that teacher behavior might grow beyond its current level.

The ACOT framework is a technology-specific take on a broader body of research related to change, innovation, and adoption. Research on change provides a number of key points when considering how innovations such as technology are introduced to a teacher population, adopted by teachers, and how this adoption process can be managed. Specifically, one should consider that change is highly personal and is made first by individuals, then by institutions. Interventions -- such as professional development -- must be related first to *people*, and then secondly to the innovation itself. In the area of technology, this basically means that technology professional development needs to address the personal concerns of teachers as related to their individual practice. Training that is generic to the technology itself (e.g., applications training across grade and content levels) will not be particularly successful in moving teachers from lower to higher levels of adoption. Finally, change requires developmental growth. It is not possible to leap past or over stages of teacher concern and adoption. Rather, true and lasting change requires supports at all levels.[11]

In the evaluators' experience, most of the problems experienced in a school district related to introducing technology innovations are at their root problems related to change. When a district only addresses its technology problems (and provides solutions) at the *institutional* level versus that of the individual teacher, there will be problems in realizing real and lasting change. Further, when technology-related change does not account for the fact that different teachers move through a sequence of adoption steps *at their own or individual pace*, then problems will ensue. Therefore, as Sample

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[11] Loucks-Horsley and Stiegelbauer, 1991

District considers teacher technology use, it will be beneficial to consider how this use fits with research such as the ACOT framework and the broader issue of school change.

II. Findings

In this chapter, the evaluators analyze the data collected from Sample District's teachers, administrators, parents, students and community members (see Figure Three) compared against the district's indicators. In that these indicators express an overall vision for technology, this chapter starts with a discussion of the degree to which the Sample District teacher/administrator/parent community resonates with the vision. Then, the chapter moves on to a detailed analysis of district performance in meeting each of the district's five indicators.

Vision of Technology's Role in Teaching and Learning

The indicators developed by Sample District's evaluation committee express a vision for technology's role in teaching and learning. The work with the committee to develop the indicators, as well as a follow-up discussion with the Sample District School Board, was expressly designed to tease out this vision in ways that could ideally be seen reflected in schools and classrooms across the district. Therefore, one of the basic tasks for the evaluators in their work with Sample District's teachers, administrators and parents was to determine both the extent to which the vision/indicators are being met as well as what teachers, administrators and parents *think* about the value of technology to teaching and learning. The evaluators approached this task via focus groups, interviews and surveys.

The evaluators find that whereas the evaluation committee's vision centered around the types of thinking skills that students could develop through the use of technology, most teachers and administrators initially focused their attention on the fact that students needed more access to technology. For example:

> *Ideally, each student would be assigned a laptop. Each teacher would have their own scanner. This would make technology an everyday occurrence, and it would be utilized to its fullest and appropriate extent. If tech is not teacher friendly, in other words- we don't have to wait or travel across the school- to utilize tech, then it WILL be used.*

> *Obviously we would like kids to have their own wireless device that they can use. You've saved time and you have access to more that they can use over using laptops.*

When pressed by the evaluators to articulate their vision for how technology can support learning, many teachers discussed applications that would help them present information, provide drill and practice, or allow access to remote resources.

> *Technology can provide reinforcement of learning concepts through individual and group practice and also by providing a variety of methods and visuals to re-teach and/or explain concepts and ideas that the students might have trouble understanding.*

> *I think technology can support learning in many ways. There are so many great resources out there for free now! Students can have extra practice with math facts or read nonfiction texts that they have never had access to before.*

(Technology can support learning..) In many ways. Showing power points, discovery streaming, tutorials for remediation and enrichment activities.

Technology supports learning in that it teaches, reteaches, and reinforces lessons. It also holds the interest of the students. I feel it is a necessity for writing. The students need it to produce written papers, edit, revise and turn in a polished paper.

The evaluators find that student views on the value of technology closely paralleled those of their teachers. When 12th, 8th, and 6th grade students were asked "what do you think the best way is for technology to be used in school", answers pointed directly at the same sorts of things expressed by their elders.

I think the best way for technology to be used in school would be to do projects and papers on the computers and to have the class book on the computers and to look up sites and information and we should all have iPads

I think the best way for technology to be used at our school is we do some of our work on iPods or iPads to make it easier. It makes it easier to keep track of things because you don't have to keep track of all of the papers.

I think the best way for technology to be used in school are research papers on topic of choice, 15 minutes of free game time, and at least once a 30 a day to go on razkids.com and other reading websites.

For their part, parents were actually slightly more able than teachers to articulate a vision for how technology could support student learning if the appropriate tools were available. Specifically, elementary parents note that learning could be differentiated, and that the use of different tools could support collaboration and the development of critical thinking skills related to the use of online resources. Although these ideas about technology-supported learning do not seem to arise from any communication of ideas or vision from the district, parents envision technology supporting learning in similar ways to those described in the indicators. It may be parents have personal experience using technology in their own lives and work to communicate, collaborate, and perform essential functions, and therefore sense that that their students could benefit from similar opportunities. Nevertheless, their experience in Sample District schools is that such opportunities do not exist for their students, and they are concerned. Often this concern was conveyed by parents who stated that their students were attending schools that are "behind the times" and that students are not being prepared to function successfully in the world outside the classroom. For example:

Technology will take us farther in the world of education. We must be able to compete with advanced countries and technology is the only way to get there and stay there.

I think with the world around us being so technological, that we have no choice but to follow suit so that our students can be successful as they leave us. Anytime it can be used, it should.

Our society is moving at a rapid pace with new technological advancements. It is imperative that our students be on the cusp of these innovations so they are prepared for the anticipated technology-centered future ahead of them.

Technology has its cons and pros but we need to prepare our kids for the competitive world that is outside.

It is a very important piece in the children's education. The students need the updated technology in order to stay on top of the quickly growing technology that is out there. Without the correct technology our student will be behind.

This finding again exposes the fact that the district has not effectively communicated its intentions – as reflected in its vision – for technology to transform schools and classrooms into the sorts of places where students work and learn in ways dramatically different from the traditional. Most importantly, it is clear that teachers have not been provided with the direction, tools, or training necessary to implement the concepts of teaching and learning that both parents and the district leadership desire. So at best, there are ideas but no consensus on how to actually implement those ideas.

Student Skills and Outcomes

Sample District's performance indicator for student skills and outcomes states:

> *All Sample District students have skills in the "4Cs" - communication, collaboration, critical thinking and creativity. They are self-directed learners who utilize their teachers as facilitators and motivators for learning. Students are good listeners, innovators and problem-solvers. Overall, they are well-rounded in terms of their skills and abilities and are college/workforce/career ready.*

This indicator logically breaks down into two categories of analysis – how students use technology to support the 4Cs and the degree to which technology supports Sample District students to be prepared for their lives after leaving the district's schools. Each of these two categories are considered below.

Use of Technology to Support the 4Cs and Information Fluency

In classrooms across the district, the evaluators saw technology being used to support a variety of activities. In many places, teachers were observed using 3M boards to project materials such as worksheets and videos (including those from online sources such as YouTube or Discovery) as well as "slides" produced by the interactive white board (IWB) software. These activities were largely teacher-directed, whole-class activities in which the technology functioned as a presentation tool in the hands of the teacher. Students were occasionally called upon to write on the interactive whiteboard, but their use of the technology was sporadic and teacher-directed.[12] Looking at this sort of presentation mode use of technology through the lens of the ACOT framework (see Figure Five), the evaluators find that much of this functions in the "Adoption" mode of traditional learning environments (see Figure Four).

Students were observed interacting with technology more directly in computer labs (including the STEM labs in the junior high schools) where they participate in various computer based instruction (CBI) activities, typing papers, or conducting Internet research. In the junior high schools, students were observed participating in the 7th or 8th grade "Technology Applications" course, which focuses on developing typing skills as well as basic fluency with productivity applications such as Word, Excel and PowerPoint. Students were observed in some cases using devices such as calculators to solve problems and students in secondary schools science labs across the district were using a variety of science equipment and probe ware. A number of classes at different levels were seen using "clickers" as input devices during teacher-conducted multiple choice tests/quizzes.

The evaluators were told that there is an official BYOD pilot in operation at the high school level although only a few instances of BYOD use were observed in the high schools. At elementary and junior high schools, there was confusion on the part of many teachers and parent as to whether the district's BYOD policy applied to any schools other than high schools. The evaluators were told of several instances of elementary and junior high students using their own devices (Kindles or Nooks or sometimes iPads) for reading. Several teachers indicated that they would like to allow students to bring in Kindles, etc., but that these were still prohibited for any students other than high school students. It is

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[12] Here it should be noted that in the Early Childhood schools the white boards are mounted at adult height and are therefore completely inaccessible to students unless they stand on a jury-rigged, potentially dangerous, platform to reach the board.

clear that there are a variety of different interpretations of the district's BYOD policy among teachers and other community members.

The evaluators encountered several elementary schools, as well as individual teachers, that have taken their own initiative to bring iPads or other similar devices into the schools. Often these initiatives are funded by parent support. In one school, parent funds have underwritten a cart of 30 iPads, the purchase of apps, and a small amount of vendor-based training. These initiatives are still in early stages and hence were not observable by the evaluators.[13] The evaluators were told that one of these initiatives (the school with the 30 iPad cart) has been adopted as an official pilot by the district.

The evaluators contrast the vast majority of what was observed and described about student technology use with the district's indicator. Most specifically, the evaluators consider the line that states – "*They [students] are self-directed learners who utilize their teachers as facilitators and motivators for learning.*" In fact, it seems that while technology is being used in schools throughout the district, it is relatively rare for that technology to be used in a student-centered mode. The vast majority of what was seen by the evaluators was essentially technology being used to support very traditional pedagogies (again, in the ACOT "Adoption" mode discussed in Figure Five). In fact, some of the most prevalent technologies in Sample District such as the 3M boards tend to reinforce teacher-centered instruction. They offer convenience, and allow teachers to more easily generate, save, and perhaps distribute visuals, but they do not help to transform learning from a teacher-directed to a student-owned process.

As a way of underscoring how learning *can* be different from the predominant model found in Sample District, the evaluators were able to find some examples of teachers working in ways that do meet the main student outcomes indicator. For example:

> *I teach 4 classes of science. We have a project based approach to anything that we do. For example, building biome boxes. We do more project based learning. I think that 90% of it is project and only 10% is textbook.*

> *My room is set up in pods of 4 so that they kids face each other so that it's about them, not me. I'm just the guide.*

> *…But going back to the 4Cs, that's how I run my classes all the time. I hope to move to 0% lecture.*

> *I do something I call teacher swap. To review and get ready for 2nd quarter. The students switch roles and groups – the collab piece - they have to develop a 20 min lesson to teach the class. That gets to 21stC skills because they use Prezi and other tools. They have to learn to be a coach and how to explain things to people who have questions. That takes them through the teaching and learning process.*

Still, the evaluators did not observe many classrooms that incorporated collaboration or project-based work. In focus groups, secondary teachers in particular noted that their students were not very skilled in collaboration.

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[13] In the 30 iPad school, the equipment had so recently arrived that it was still in the shipping boxes and had yet to be unpacked.

These kids want to be spoon fed. They want you standing over their shoulder to give them things. If I put four kids at a table and expect that they will get excited to develop knowledge, it doesn't happen.

When you start them, you put them in a group and it's playtime. But later you get them to differentiate roles and they can just go. They all know how to do a worksheet, but they don't know how to work together.

I think that the cooperative work is formed before they get to 9th grade in the upper level kids…The lower level kids are used to being hand-fed and we have to keep doing that.

The evaluators' observations and teacher comments are further supported by survey data. As Figure Six shows, teachers at all levels on average report that there is no NETS-S described activity (the described activities are those related to the 4Cs) that occurs much more often than "several times a semester". In most cases, activities occur much less frequently.
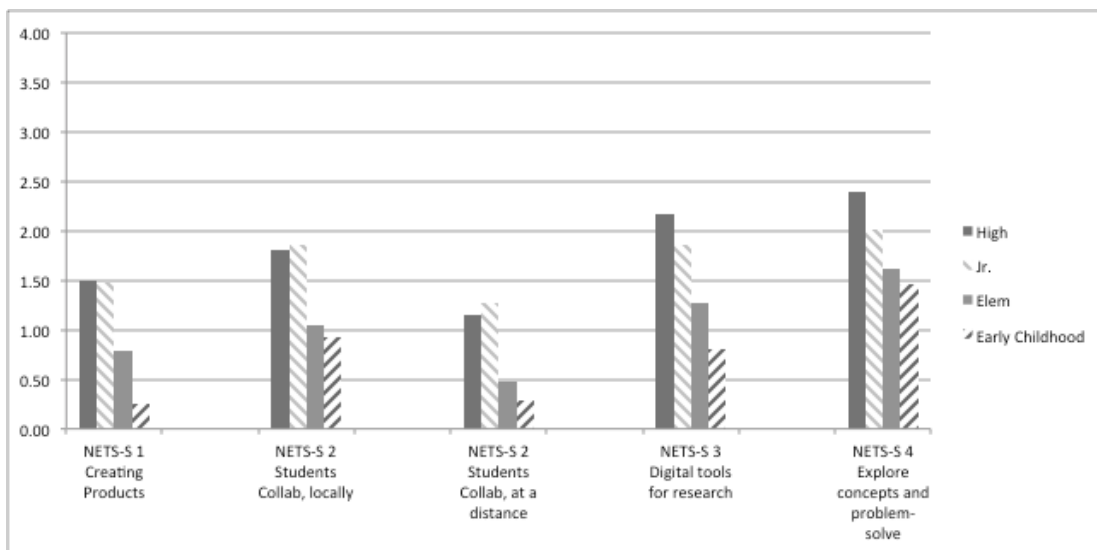
Figure Six - Frequency that students, by level, engage in particular NETS-S described activities as a result of teacher assignments. (Scale - 0 = Never, 1 = Several Times a Year, 2 = Several Times as Semester, 3 = 2 or 3 Times a Month, 4 = At Least Once a Week). Teacher survey question 2.

Data from teacher survey question four (Figure Seven, below) underscores these findings. Here, teachers were asked to agree or disagree with a range of statements about how their students use technology. The data clearly shows that in most cases, PK-1 teachers disagreed that their students have the technology skills discussed in the survey questions. Junior High teachers tended to agree more that their students have technology skills, and this is likely the result of the high profile given to the 7th and/or 8th grade Technology Applications course (and perhaps the STEM course). Teachers at all levels disagreed that their students have sufficient access to technology tools.
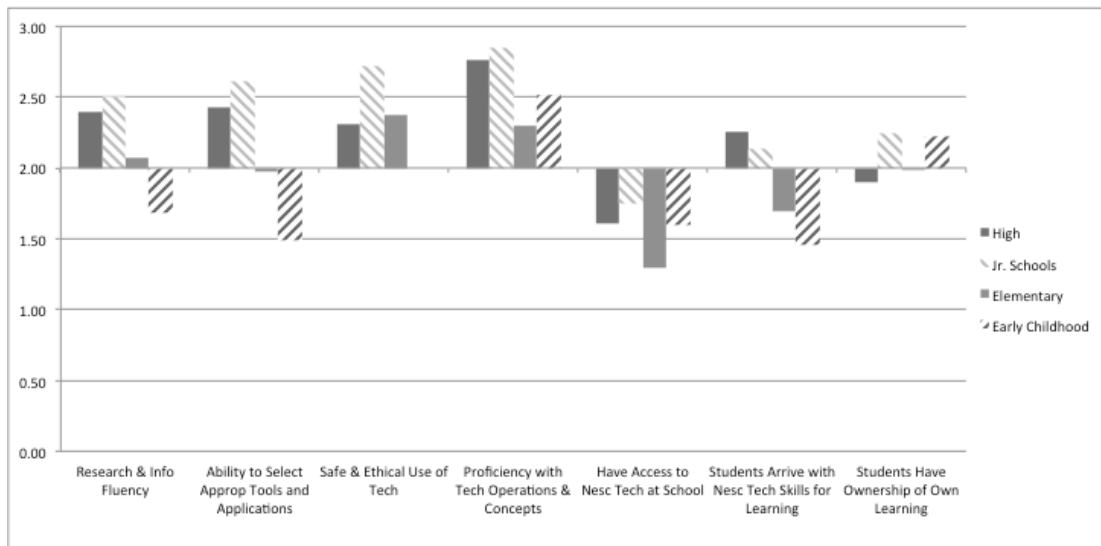
Sample District Schools
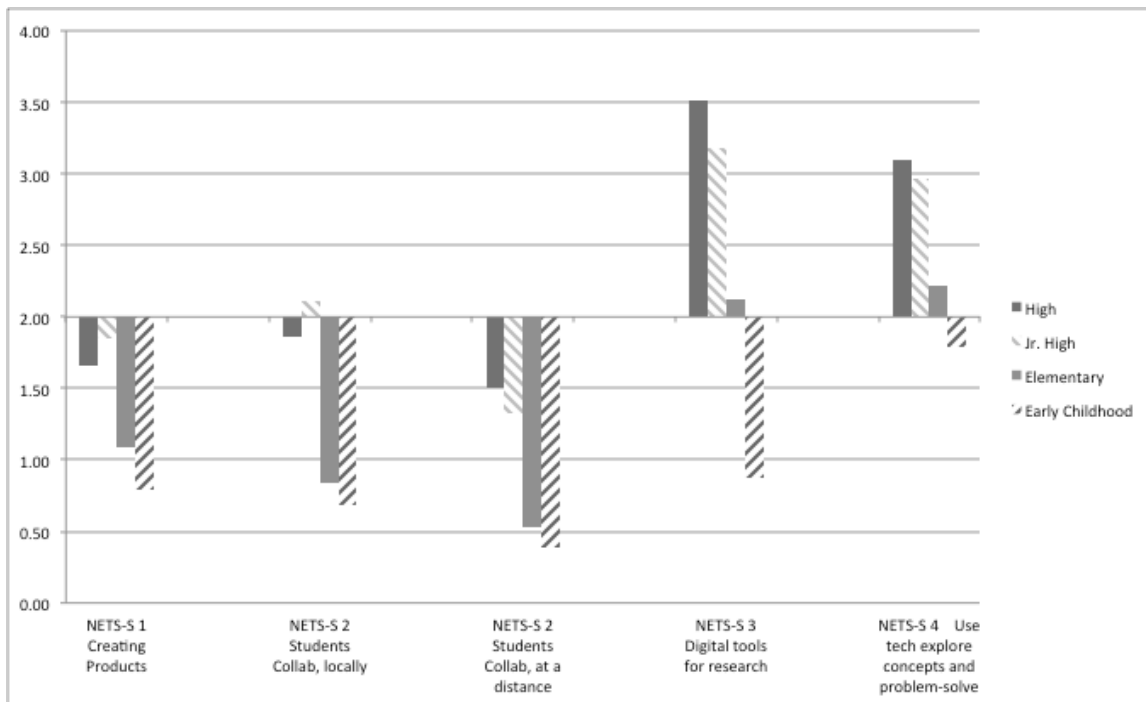Instructional Technology Evaluation

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Figure Seven - Teacher degree of agreement with statements expressing that their students engage in various NETS-S aligned practices in school. (Scale – 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree) Teacher survey question 4.

As shown in Figure Eight, parent survey data aligns with the teacher survey data. Parents also tend to disagree with the assertion that their students use technology to support the types of activities aligned with the 4Cs. Only in the area of "research" and "exploring concepts and problem-solving" is there agreement that students use technology to support this activity. One possible explanation for this agreement may be that parents interpret "exploring concepts" and "research" to be synonymous.

Figure Eight – Parent degree of agreement with statements expressing that their students engage in various NETS-S aligned practices in school. (Scale – 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree) Parent survey question 2.

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While the data shows that overall there is relatively little teacher use of technology to support the 4Cs, the evaluators nevertheless did find that some Sample District teachers have moved beyond the norm and have made exploratory efforts to apply technology-based solutions for developing these critical student thinking and learning skills. For example, the evaluators found some use of Edmodo to support communication and collaboration. Edmodo is essentially a social media application that supports class discussions between teachers and their students as well as directly between students. The evaluators find that Edmodo is used by a number of secondary (mostly junior high) teachers and even some elementary teachers.

> *Our team is using Edmodo. Kids who are struggling can post and help each other out. You can also set it up so that they can work on projects in small groups.*

> *I'm using it for the first time. Kids are asking and answering questions. I get an email all of the time and I can see them answering their own questions. I love it. It's easy to use. It's Facebook like.*

> *Our kids use Edmodo. Even just little things like I can't remember what the assignment was ... being able to ask someone and post a question where the teacher is monitoring is great.*

Still, the evaluators were repeatedly told that Edmodo was not an officially sanctioned solution and that teachers were "on their own" in terms of using it. Some teachers seemed to feel that Edmodo use was discouraged. This sort of confusion about what is and is not supported also pertained to the use of videoconferencing technology such as Skype.

> *When I think of kids of communicating collaborating…in 2nd grade…wouldn't it be good to communicate with other 2nd graders in another school, state or country? We would like to do that. We had a teacher that went to the Dominican Republic. It would have been great to connect with her while she was there...why can't we do that? The district tech department won't support that.*

> *We can go and find things, but we can't do anything blog related or anything that anyone in the outside world will allow to see students. We can't Skype or do any kind of video conferencing. We have all of those rules about children being seen. So I get that. But our current parameters are for us to go out and find info, but not to share info from the school.*

> *I would love to be able to have students interacting with professionals in the field that we are studying, but we have no ability to Skype.*

> *We would like to have kids Skyping and using things like Google docs. People have been afraid to do things because there was such a lock and key on things. But we're starting to unlock some of those things. The social media piece was never allowed, but now we're opening that up. Some of my teachers have created websites as communication tools for the family and themselves. We're starting to see more and more of that. But at the elem level that's not required. We're not allowed to use Edmodo yet.*

Another district initiative that might offer an opportunity for supporting the 4Cs with technology integration is Sample District's BYOD initiative. The evaluators find that it is possible to view the

BYOD initiative as a step toward collaboration in the classroom. Best practice for 1:1 computing, as well as the evaluators' own professional experience shows that support for project-based and small group work is the main educational purpose for encouraging students to bring in their own technology and use it in a flexible, as-needed, mode. It is possible that some of this sort of use is occurring in the high school BYOD pilot, but for the most part the evaluators found that BYOD was largely seen by teachers as a way to allow students to use devices for individual work.[14] At the junior high level, teacher evidence points to the fact that teachers are aware that collaboration and sharing might be facilitated by BYOD, but they have yet to figure out how to incorporate that into their largely teacher-directed, full class, instructional model.

> *They say that they want to use it and will share, but I know they just want to check their phones. I plan on using it, but just not right now.*

> *My biggest concern is that my advanced classes all have them, but I go in my general class I could have 10 kids with iPhones and the rest with nothing. How could I have them all buzzing in when not all kids have them. I don't want other kids to feel bad.*

Overall then, while BYOD *theoretically* should be a boost to project-based work and collaboration, the evaluators find that for the most part this is not occurring because Sample District teachers are (as has been shown by the data earlier in this chapter) primarily focused on a direct-instruction mode that is about individual students interacting with instructional content. In this construction of learning, technology is something that each student needs in order to interact with his/her own content. BYOD in this context offers a possible solution to student access to devices, but as most Sample District teachers see it, only if each student has access to his/her own device.

Students are College/Work-Force Ready

Sample District's indicator for student outcomes concludes by stating that students will be "college and work-force ready". Inclusive of skills such as 4Cs and other core NETS, this part of the indicator also looks at whether students have developed the ability to think creatively, solve problems, innovate, collaborate, and contribute productively to the work of a team. Additionally, the vision for college and workplace readiness calls for students to be able to access, analyze, and synthesize information as well as make use of a variety of current technology applications and systems.

In order to gauge parent opinion on whether their students are college and work-force ready, the evaluators put this question directly to the parents of high school students. The typical responses to this question suggest that in fact this is an area of concern:

> *Having 2 sophomores in college, no. They have never been required [here] to do any online course work. They didn't have a slightest clue about how that interaction works.*

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[14] Although as noted earlier in this chapter the evaluators heard very little from high school teachers concerning the BYOD pilot. There were five specific high school observations of teachers who participate in the BYOD pilot in both high schools, and the main use for personal devices in those classes appeared to be to support individual student use of technology for taking photos, listening to music, scanning QR codes off of worksheets, or calling fellow students to discuss homework and other assignments.

Part of our job is to prepare kids for what comes after HS. When I see what my son is doing in OH State, I know that we're in the Stone Age. We are woefully preparing kids to be learners at the college level. We're still getting them to turn in paper assignments.

Some students are getting that because they have to take courses during the summer. My kids are doing it on their own. But the most they'd know otherwise is a graphing calculator.

My children are learning the "things" that need to be learned for personal development i.e. reading, writing, math, but not the "skills" needed in today's world of technology. My children are not certain of how to find and then select appropriate resources for information gathering because there is not enough time built into the curriculum to allow for that type of teaching. There are no information resource lists that come home from school with recommendations, etc. so as parents we guide them along at home while they research here, at home. We have also taught them how to be safe online. But all in all, Sample District is extremely far behind the technology curve and so are our students, which as a parent whom votes for the levies is disappointing to say the least.

Another point that came up in a number of parent comments was that it would be beneficial for their students to have some experience in online learning prior to moving on to college. Several parents noted that so much of what students do in college now is online, and that there are no opportunities for Sample District high school students to participate in online courses. While this is technically not entirely true as the district does offer Apex learning courses for credit recovery and make-up credits, these are not typically courses taken by mainstream Sample District students. In relation to how the district currently handles online learning, the evaluators find that the district's current implementation of online learning exists within a very locked-down model that is essentially computer-based instruction. It is not at all "self-directed" learning in that students are required to take the courses in a regular classroom and under the strict guidance of a teacher-proctor. Sample District's online courses continue the teacher-centered, direct instruction, model prevalent in most of the live teacher classes the evaluators observed. This is not the model used in most college online courses.

Parents tend to believe that their students are savvy with social media but lacking in important media literacy skills that relate to critical thinking. Likewise, many parents feel that the lack of access to technology in school hinders their students' development of essential technology and applications skills.

I believe that the technology courses offered at Sample District are extremely limited. The world is forging ahead by leaps and bounds where technology is concerned….The learning needs to go beyond MS Office programs. They need to know and understand the impact technology has on every part of life.

The students need to use Excel or and Excel type program more. In the business world they need this tool and not many classes have the students use this program.

I believe that the district needs to look at the way colleges are using technology to submit homework, papers, tests and quizzes. Once they have done that they need to have at least the seniors prepped and ready to complete their assignments in the same way. Colleges are using Springboard and Blackboard on their campuses, Sample District needs to be doing the same.

I know some math classes do want you to not use a calculator and show work, but in most careers, we have access to those items with our computer @ work as well as excel, I think these programs should be utilized in a learning environment.

In terms of basic technology competencies – which are useful for students during their school career as well as in their life beyond graduation – the evaluators find that the junior high Technology Applications class does a good job of establishing baseline student skills in common applications. Particularly in a district where elementary school technology exposure varies widely, the Technology Applications class seems to be a standardizing activity that has been largely successful in insuring that most Sample District high school students can type (certainly, in the evaluators' opinion, at a much greater level of proficiency than in many other high schools). Furthermore, this class demonstrates impressive reach in that it is currently able to involve very nearly every junior high student in the district.

The evaluators note there is some discussion about eliminating the Technology Applications class (or making it optional) in light of the implementation of the junior high STEM curriculum. Here the evaluators note that the skills taught in the Technology Applications class are *not* equivalent to the technology experiences that students have in the STEM classes. In STEM, it appears that students use computers for computer-based instruction and to some degree for drawing and designing, but these are quite different from learning to type and learning the basics of applications such as spreadsheets, word processors, publishing tools, digital media production, and presentation managers. These basic technology operation and application skills do have a place in the K-12 curriculum and mastering these skills is one way of becoming college and career ready.

Finally, parents and teachers state that research and information literacy is a skill that students should have in preparation for college and life beyond graduation. In this regard the evaluators find that the general consensus among teachers and parents is that students are not developing these skills.

> *They're being taught to find answers, but not how to learn. The creative thinking, the problem solving, they're not getting that…they're just assigning things for busy work and not for critical thinking.*

> *In science what I see is that they don't sort through the Google hits to find credibility. They come up with equations that are completely irrelevant, but they argue that it should be valid because it is the second hit on Google. The ability to critically look at things doesn't exist.*

> *None of my kids have been taught to research. Not in the library or online*

> *…there's no formal inst on this or anything about ethical use of tech in school. They get it from home.*

> *They are very skilled in social media, but for them to go out and find info on their own, they really lack the skills to find meaningful things.*

Overall, the evaluators find that parents and teachers are quite concerned that students are not receiving preparation in key skills identified as necessary for "college and career readiness". The evaluators concur and find that for the most part this is due to the fact that Sample District students do not have opportunities for using technology effectively within the instructional environment. Without the

classroom resources, and teachers who are skilled in developing the thinking and learning skills *behind* technology use, Sample District's students are missing out on the ability to utilize technology to develop the skills that will prepare them adequately for their life after graduation.

Teacher Skills/Pedagogy

Sample District's performance indicator for teacher skills and pedagogy, states:

> *Teachers are facilitators and guides for student learning. They are knowledgeable and skilled in fostering student ownership of learning, and work in a partnership with students around learning. Teachers are able to engage students; meet the needs of all learners; question students and provide feedback; and provide different levels of support to meet the needs of all students (understanding where the student is and where they need to be). Teachers have a basic understanding of technology applications for productivity (Word, Excel, etc.) and understand what is available to them through technology. They know how to do and teach effective research. Teachers know what their students need to know in relation to technology.*

As with the previous indicator on Student Skills and Outcomes, the Teacher Skills and Pedagogy indicator is a direct reflection of the ISTE NETS standards, this time the standards for teachers (NETS-T). In particular, this indicator focuses on NETS-T standards 1, 2, 3 and 5, emphasizing teachers' ability to support and facilitate learning environments that inspire student learning and creativity, to design and develop "digital-age" experiences and assessments, to model digital-age work and learning, and to engage in professional growth and leadership using technology-based tools and environments.[15]

As stated in the previous section, the evaluators find that the issue which underlies *everything* that happens (or does not happen) with regard to technology use in Sample District's classrooms is the lack of a clearly communicated vision for what technology's role in education should be. Therefore, the primary finding about teacher skills and pedagogy is not really about what teachers can or cannot do, but rather what they believe they should be doing. Without clear direction – that is, a vision – there is no real basis for assessing pedagogy. The evaluators find that Sample District teachers are simply doing whatever makes sense to them as individual professionals, working without a map. The vision for teacher skills, as stated in the indicator, is not operationalized by the district in any meaningful way.

In the absence of any truly shared understanding about what teachers should be able to do with technology in the learning environment, most teachers and administrators have defaulted to the rather reasonable belief that teachers should be able to use technology in ways that parallel those expected of any modern professional. That is, that teachers should be able to operate a computer workstation in order to produce and share materials. In this regard, the evaluators note that the vast majority of Sample District principals describe their teachers as "tech savvy". Principals believe that their teachers have the technology skills necessary to make use the tools that are available to them. For the most part, the evaluators would agree with this assessment. Teachers throughout the district were observed using classroom technologies (interactive white boards, document camera, basic applications, and in some cases iPads and Kindles) to teach, and many report that they use technology regularly to prepare for class, communicate with students, and record grades. As shown in Figure Nine, below, most teachers indicate that they use technology for "personal productivity" at least "2 or 3 times a month".

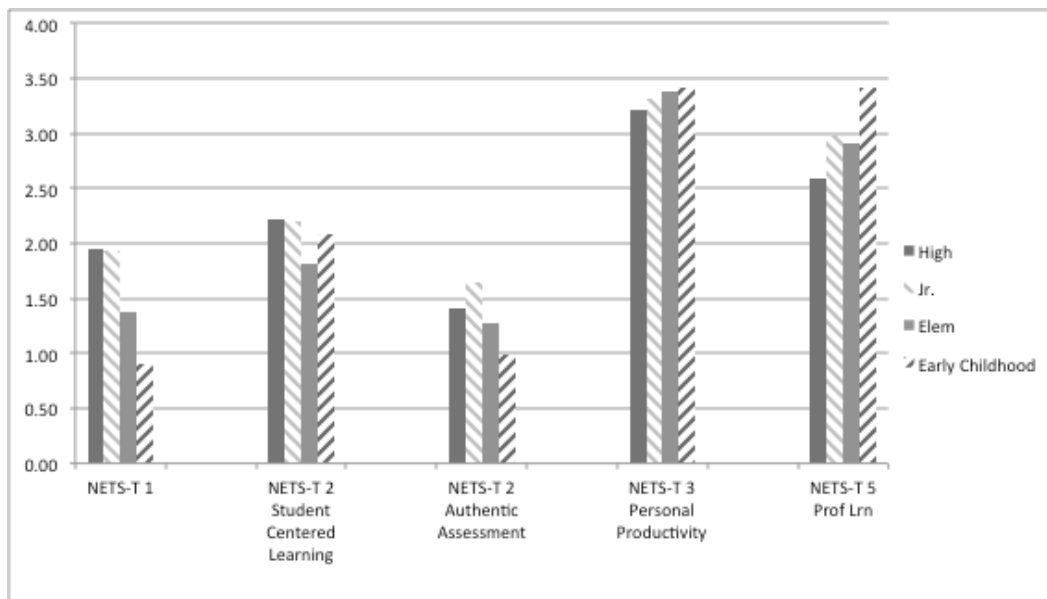[15] See the Appendix for a full list of ISTE NETS-T standards.

Figure Nine – Frequency with which teachers report using technology to support various tasks. (Scale - 0 = Never, 1 = Several Times a Year, 2 = Several Times as Semester, 3 = 2 or 3 Times a Month, 4 = At Least Once a Week) Teacher question 3.

Teacher comments underscore the frequency with which teachers use technology for their own personal and professional productivity:

Email, internet, spreadsheets, electronic documents, just about every aspect of my job.

I use the iPad app called "Confer" to keep reading, writing, and word work and math problem solving conference notes daily. This is the best app I have found to keep conference notes. I am able to group students and record information on several students at the tap of a finger. Because of this quick means of keeping authentic assessment, I am able to conference with more students than I was able to before when I hand-wrote conference notes and guided group notes.

Create PowerPoint presentations for class notes; imbed animations and movies from discovery streaming for enrichment and better understanding of the concept; websites to help students review concepts and study for assessments

I create class handouts and presentations daily. I use Google Books. I also post links and attachments via TAC for student use.

Technology is used daily to log information necessary for IEP, grades, parent communication, teacher communication and attendance.

Some teachers indicated that they use technology for collaboration and professional learning:

I am a member of many educational blogs as well as teacher Edmodo groups where I am able to share my teaching methods and am constantly updating what I use in the classroom.

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> *Email to other members on my team to discuss ideas for teaching and best practices. idiscovery classes to collaborate with other outside my school. currently not enrolled in one but have used in the past.*

Nevertheless, the skills that Sample District teachers generally demonstrate with regard to technology – while clearly of great value to them professionally – do not go far enough in terms of transforming teaching and learning in the ways envisioned by NETS. As discussed earlier in this report, the NETS standards have at their core an orientation toward student-centered learning, with students as the primary users of technology within an environment that emphasizes self-direction and inquiry. In the language of the indicators, what this means for teachers is that they *are facilitators and guides for student learning.* When considering the NETS-T skills that are most supportive of new (which for Sample District would mean *changed*) pedagogies – e.g. NETS-T 1 and 2 – the majority of the data points to the fact that few teachers engage with these skills. Many Sample District teachers point to this finding in their own comments, expressing the sense that they know there is something else they could be doing. For example:

> *I feel that we often skim the surface with instructional technology. There are excellent resources available that a few teachers use very well, while others, like me, are eager to learn, but do not have the knowledge base or time to develop a repertoire of instructional practices that would best benefit students.*

> *Ways to help facilitate more student use of tablets and iPads in the classroom because our students come to our classes with these 21st technological materials and then we tell them to put them away and pull out a hardback that Wasserstein published many years ago and far from utilizing current information, and we wonder why they zone out*

> *I would like to know about new resources and tools that are able to be obtained through the internet. For example, I learned how to use Wordle last year at an in-service and I enjoyed it just as my students did. More tools like that would be helpful to know.*

Without grounding in a clearly communicated, district-wide vision for technology-supported 21st century learning, Sample District's teachers are on their own to develop ways to integrate the resources that are available to them in the classroom. That many of them integrate those tools within a largely teacher-directed learning environment should be no surprise, as it is this mode of instruction that tools such as interactive whiteboards and document cameras most naturally support.

So in summary of the findings related to teacher skills and pedagogy, the evaluators emphasize that the issue here is *not* really the skill level of Sample District teachers in terms of their being good, proficient, enthusiastic teachers who work hard to engage their students. They are clearly all of those things. But what is equally clear is that teachers have not been provided with a motivating vision (that is, a vision that drives performance in a new, specific, direction) for teaching and learning. This is largely an issue of policy and leadership and will be taken up in the next section of indicator-based findings.

District Policy and Administration

Sample District's indicator for District Policy and Administration states:

> *Administrators have a common vision for technology's role in teaching and learning that is aligned with the district's vision/direction. Administrators lead and inspire teachers to perform and to engage in professional development. Administrators support teachers in achieving the vision in the classroom by modeling, coaching, and providing/supporting opportunities for teachers to be trained in multiple venues (e.g., job-embedded, instructional coaching model, podcast/webinar, professional learning communities). There is a concept of accountability.*

This section of the district's indicators describes how the district – administration particularly – communicates and supports its vision for thinking, learning and teaching. Therefore, attention is given here to leadership, communication and teacher professional development.

Administrator Leadership and Communication

As discussed earlier, the evaluators find that there is no commonly held vision for 21st century learning and teaching in Sample District, nor has the role of technology in that environment been clearly articulated. Rather, the district seems to operate a number of "silos", each concerned with a different initiative such as "technology" or "the Common Core" or "STEM". Although the district seems quite busy working within many of these silos, there is little evidence to suggest that these various initiatives have been coordinated in any strategic way. As yet, efforts to train teachers in the Common Core, for example, do not include consideration of how the skills desired in NETS intersect with skills necessary for meeting the Common Core. Likewise, when administrators were asked how their teachers addressed the 4Cs on a typical day in the classroom, a common response was that because technology has been in such short supply, this was not something that had even been explored. Without a vision at the top articulating how the various initiatives connect to support the kinds of 21st century learning called for in NETS, the Common Core, and STEM, even those pieces that *could* be tackled with limited technology (i.e. the 4Cs) are left largely unaddressed.

Coordination of all the pieces, or horizontal integration comes about as a result of communication among administrators at the top whose planning and actions---ideally—are synchronized in service of a commonly held vision. While individual administrators may focus on specific initiatives or areas of expertise, their work should be continually reflective of the district's vision and ideas about "what does this all mean, and how do we get where we want to be going."

An example of how initiatives in Sample District transpire without connection to a bigger picture is the district's current BYOD initiative. When asked about BYOD, many parent comments were along the lines of the following:

> *From the district's perspective, what are they trying to do? Are they letting people bring their own devices, or trying to lock things down*

> *There's still controversy as to what can be used where. They've told us that there is a select group of teachers who are testing it. Not everyone is allowed to use it.*

There's resistance at East to some tech being used, but yet now we're a BYOD school. My daughter was told to put away the kindle because it's a toy.

The teacher and parent community in Sample District is aware that some students can use personal technology devices in schools, although it is not universally clear which students are included. As was discussed earlier in the Findings related to teaching and learning (page 22) there is no articulated understanding as to what students would be doing with these devices, or more importantly, *what the educational value* would be for personal device use. Hence, opinions as to whether BYOD is a "good" or "bad" policy tend to revolve around personal taste and perceptions. Perhaps the only common thread in these opinions is that the policy has potential for negatively impacting "equity" (by calling attention to the fact that not all students have devices to bring to school).

The evaluators believe that such opinions are perfectly reasonable, and are the extent of what could be expected given that no other information has been shared with the community about the real purpose behind the new policy. And what is that "real purpose"? In fact, it connects (or should connect) to the desire to create the type of student-centered, self-directed, highly student-owned, learning environment that is *essential to student success in initiatives like the Common Core*. This is would likely come as a surprise for many parents (and probably many teachers), who actually have little understanding of the Common Core or the pedagogical changes that it implies. The point is, technology connects to broader instructional/curricular initiatives, and these initiatives depend upon access to (and skills in using) technology. That is the sort of horizontal integration that Sample District needs, but the evaluators find that the Sample District community has not been led to having such a discussion.

As with the many teacher comments about what they do not have in terms of technology resources, it is all too easy – and the evaluators would maintain, incorrect – to read many of these teacher/parent/administrator comments simply as individuals' confusion about particular initiatives. To do that would be to miss the larger point that the reason there is confusion around why certain things are happening (or not happening) is because *the community has no context into which they can place their knowledge about what they observe on a daily basis*. There is no effective communication about where various initiatives – in this case, those related to technology – are headed.

The evaluators' finding about a lack of communication extends to communication within buildings and between schools. Confusion about the most basic issues surrounding licensing of software, network procedures, the BYOD initiative, "what happened" to instructional technology representatives and building technology representatives (or for that matter, what the difference might be between those positions), etc. runs rampant in Sample District schools.

A major problem is that we only had one ITS who was as teacher on special assignment, and now she's gone. We only had 1 and that was surprising, and now we have none. They just took the head off of all of the staff. There's no one there to lead the staff. The principals don't know. There aren't a set of rules for what we are allowed to do or now.

It is a shame we lost the technology person at both the building level AND the district level.

Teachers on several occasions in focus groups and interviews noted that at very least they would appreciate having some sort of online system – something as simple as a wiki or even an old-fashioned

electronic bulletin board or shared drive – for sharing curriculum ideas, questions, and the like. No such system seems to be in place.

Professional Development

The evaluators find that while Sample District teachers are aware of the district's professional development efforts related to various high profile initiatives (e.g., the Common Core), they feel that there is little meaningful professional development that helps teachers reach the goals expressed by the district's technology indicators. There are many teacher comments in the surveys and interviews that are similar to the following:

> *[We have] Lots of PD in terms of formative assessment, common core, reading strategies. Those have taken the lead. But not so much about tech or how the 4Cs tie into that.*

> *… adults have to be forward thinking…But first there needs to be some education for all the adults before they will put the technology in front of their kids...professional development needs are great around this.. what is out there. How do we access it, what tools can we use? It can work for students, we can make it safe.*

> *[It's] not only just the hardware, but also the education of our teachers. Our elem is looking to bring in a whole bunch of iPads, and one of the things we're looking at is will they be used. We have laptop carts sitting there with no use, will that happen to the iPads?*

Several issues emerge when considering the lack of technology professional development in Sample District. First there is the overarching issue that there is just very little professional development of any sort offered to Sample District teachers. As a district organized initiative, most professional development is restricted to brief periods of time (45 minutes) once a week at the beginning of the school day. While many teachers and administrators describe this time as being essentially better than nothing, it is noted that it is very difficult to squeeze meaningful discussion and learning into such short periods of time. While it would be possible (and this may be the intent) to let these brief periods inspire more in-depth, and informal, work among small groups of teachers at various points during the school day, the current district situation regarding staffing serves to work against such informal training. For example, in elementary schools all teacher planning period time has been consolidated into a single after-school hour where guidelines dictate that the district and principals cannot "organize" this time or dictate how it should be spent. On a very practical level, teachers must use this time – their only time without students during the day – to prepare for class. The time cannot easily be devoted to any kind of structured professional learning. Similar situations exist at other grade levels (junior high, high) although there is variability as to when the consolidated planning time occurs.

> *We still have a period of math lab, but no recognition that people who use math in chemistry and physics still use math. The new planning period structure really compromises that.*

> *Time is a barrier. I have many more ideas in my head than I ever can do. Simply because there's no space in our schedule to plan or innovate.*

The end result is the same across the district; that is, there is little or no time where the cohorts of teachers can gather to engage in specific professional learning opportunities. Teachers are more or less on their own and need to take individual initiative to attend to professional learning. This is not a recipe that is conducive to spreading or developing a commonly held "vision" of a new pedagogy, much less the development of skills necessary to employ new pedagogical approaches.

> *I feel like a lot of times the answer for this question is a generic professional development request. But we're all so different at the HS level that we just need the time to develop professionally. Don't make me waste my time sitting through some generic thing.*

> *2 years ago we all had to sit through some 45 min thing on a program [Prezi] that's basically PowerPoint. What a waste of time.*

> *Sample District needs to help teachers support students in these areas and continuously offer professional development to keep up with ways to implement technology in the classroom and throughout the school.*

The district does have three professional learning days built into the school year, but as is the case in many districts, these days tend to be taken by showcase initiatives that provide little opportunity for teacher/building input and no real follow-up time for reflection or hands-on skill development.

> *All of our CC testing will be online. Meaning Math and ELA. The state has already said it will do Science and SS. So our teachers need the equipment and knowledge base so that when their students are put to an assessment, they're not tripped up (by things like fonts, or drawing lines, etc.)*

> *When we talk about technology, what are we defining as a tech tool. Is it something that allows students to access and publish info? Or is it something that I'm not even thinking about that would allow us to enhance the common core as we bring it into the classroom?*

Another related issue around professional development is the fact that as of this school year, there are no in-building staff to attend to issues related to instructional technology integration. The building technology representatives and the instructional technology representatives no longer function.[16] This loss is in addition to the elimination of the district's single Instructional Technology Specialist last year. In the past, the building technology representatives coordinated with the Instructional Technology Specialist and district technology staff to address a wide range of instructional technology support and informal professional development needs. Due to budget cuts, the BTR were removed and as of this year, the Instructional Technology Specialist position was eliminated -- a situation representative (to many teachers) of the district's lack of commitment to the integration of instructional technology in day-to-day teaching.[17]

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[16] As noted earlier, there is debate and confusion as to whether or not the instructional technology representatives still exist. As far as teachers and principals are concerned – based on overwhelmingly consistent statements to the evaluators – the positions do not exist.
[17] The evaluators note that the loss of building and district instructional technology support is in addition to the elimination of the elementary school "technology teacher" positions several years ago. The end picture – to teachers – is the continual deterioration of technology support and general lack of district commitment to technology.

Last year I was the ITR for our building. We had "Tech Tuesday" where each week I held class with whatever people wanted to learn. It was great. We did everything from classroom web pages to excel. We covered so many areas. People are asking me if I am going to have classes again this year, but no one can tell me if we have that position still. Even my principal doesn't know what to tell me.

In a perfect world, we could have the opportunity to work with a fulltime instructional technology resource person who spent their work day researching best practices for kids concerning technology use and would be available to teachers in their building when needed. I found that a voluntary brief (30-60 minute) introduction to topics was not nearly enough time for teachers to gain an understanding of some of the tools and how to use them. We also felt that there is not enough time one's day to adequately visit and use what is available to us today.

We need to have our building rep. present weekly in-service as we did last year. I found that very helpful and made me want to try new ideas. Our building rep. listened to our needs and provided support to us. She was very enthusiastic and made it fun to come to our after school sessions. I could also approach her for help on things that I was working on in the classroom. She was like a coach for all of us who attended regularly.

We need the ITR position at Hopewell. People are coming to me for help with 3Ms, doc cameras, RAZ Kids, and even passwords for Everyday Math

Teachers were asked on the evaluators' online survey to identify the kinds of professional development that they feel would be most helpful. As shown in Figures Ten and Eleven, below, teachers want to receive professional development on topics such as creating project based learning opportunities and on creating digital media for instruction (podcasts, videos, etc.). Relatively fewer teachers are looking for training in the more production-oriented topics such as using basic (or advanced) technology applications or using the 3M boards. This underscores the earlier finding that teachers know what they already do. What they want to be trained in are those things that they do not currently do.[18]

I would need a lot of training around how much technology changes my kind of thinking and working in classrooms with my kids. I can do Discovery streaming and can use my 3M, but I also need a lot of support.

I would appreciate the opportunity to take some classes in using the smart board, iPads and the document camera. I took some through My Professional Exchange that were very basic but now need some more advanced classes in these areas.

Sample District needs to help teachers support students in these areas and continuously offer professional development to keep up with ways to implement technology in the classroom and throughout the school.

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[18] To further underscore this point, the cohort of teachers who most want 3M training are those who work at the Early Childhood schools. This makes sense as the evaluators found less 3M use in those schools than in other schools. This is due to lack of teacher skill/experience in using the boards as well as a lack of opportunity to use the boards with children (due to the inappropriate installation of those boards, making them often next to impossible for students to use).

Finally, the evaluators find that while for the most part Sample District teachers feel that their principals "effectively support" instructional technology integration, this is against a background of very limited teacher expectations. The evaluators once again find that without a district-wide shared vision to provide an alternative model of how technology *could* support learning, teachers are essentially unaware of the ways in which their current use---and their current supports -- fall short. Expectations are low both for their own use and for what the administrators provide, simply because an alternate vision has not been put forth.
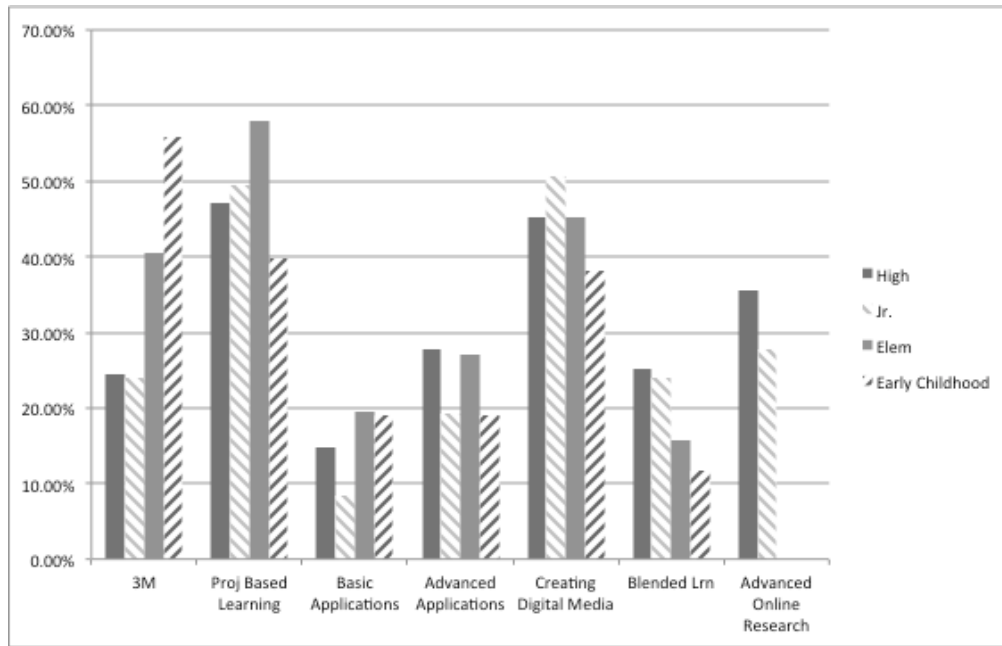
Figure Ten – Percentages of teachers desiring professional development in specific topics. Teacher question 5.
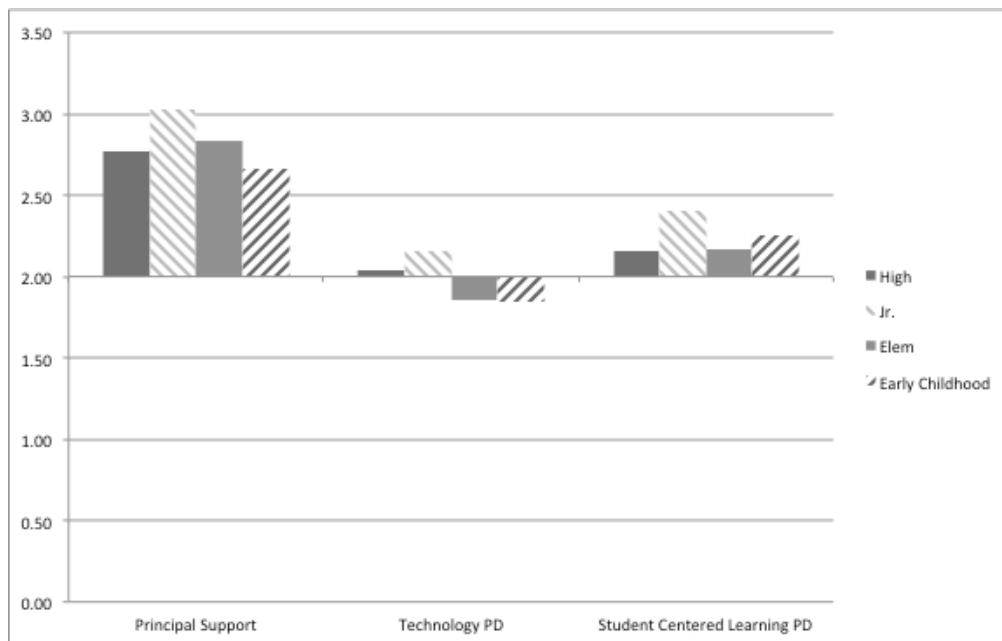
Figure Eleven – Teacher degree of agreement that they have principal support, technology professional development, and student centered learning professional development. (Scale – 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree) Teacher questions 4j, 4k, 4l.

Infrastructure

Sample District's indicator for infrastructure states:

> *There is high access to technology for students and teachers. Technology supports learning needs, and learning needs (programming) define the infrastructure. There is equitable access to the infrastructure for every child, student, teacher, building, etc. The infrastructure is well supported in both technical as well as instructional support.*

<u>Devices and Distribution</u>

> *The people who want to do things with technology are doing it on their own. They're buying their own stuff and own software. Most of us see the district as an impediment.*

As the above teacher comment exemplifies, the evaluators find that that teachers, administrators and parents across the district believe that there is nowhere near enough technology available within Sample District schools. In the teacher survey (see Figure Six), teachers across the district were universal in their *dis*agreement with the statement that students had sufficient access to technology resources at school.[19] Not only is there not enough available, but those devices that are present are often unreliable and in a poor state of repair. This is mostly a factor of the advanced age of most school technologies – e.g. teacher laptops seem to be an average of six years old – and the fact that there is no real replacement cycle to upgrade or improve equipment. Some equipment *is* upgraded, but this seems to happen randomly and without any clear input from users. Surveys, interviews and focus groups commonly produced comments such as the following:

> *Technology is difficult to use on an everyday basis because it is so unreliable in the building. I have found and wanted to integrate many ideas that require technology, but I am hesitant to implement them because the technology required is too undependable.*

> *Plains teachers need new computers. The ones we have run slow, break often and give us a headache! Please help.*

> *Our technology is too outdated to keep up with our students!*

> *I struggle with technology capability. My systems are not fully set up for the school year despite my tech requests.*

> *One classroom that had 7 computers...but they were thin clients...problems with thin clients, no bookmarking capabilities, they act as dummy terminals and are difficult to use day to day.*

> *My operating system is so old that it is no longer supporting some very basic programs necessary to my job. This is very frustrating. It is not fair to my students that we are wasting 15 minutes of class time each morning for my computer to logon, and start working.*

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[19] Parents, responding to an identical question (parent survey question 3f), were for the most part neutral in their agreement/disagreement with the statement.

We need to use technology more in our classrooms to better prepare our students for future education and careers. The problem I come across is when I try to go to the computer lab with a class, many of the computers do not work, or there isn't a printer hooked up, or the computer freezes in the middle of the project, etc. And time is a major factor - there just doesn't seem to be enough time to do projects correctly using technology.

A huge issue with teachers being willing to use technology is the unreliability thing. For example, I don't use Smart software [on my 3M board] because I'm not sure that the laptop will run it and I'm scared that they'll stop paying for it and it will go away.

As these comments show, there is considerable dissatisfaction among teachers with slow, poorly performing computers, and general lack of technology equipment. Teachers recognize the value of more modern devices that can be used flexibly in the elementary classroom, but note that in most cases, these are not readily available to them through the district.

The computers in my classroom are very slow. I do not have access to wireless internet in my classroom. There could be more age appropriate software available for kindergarten students on our computers.

An example of great practice is the IPod or iPad turn on, it is just right there when needed.… iPad and iPod… teachers use them, but many are relying on their personal devices..

It would be nice to have some iPads in the classroom to use with small groups. Computer labs are difficult to use with a whole classroom of early childhood learners.

Very frustrated with the computer lab in our building last year...rarely had enough computers for students. Would appreciate the development of early childhood children when selecting technology for their use, and when creating policies (passwords aren't accessible for them, path to accessing programs isn't accessible).

I rely on technology a lot daily and it is often not working. This makes me use it less frequently than I would like. I also create many lessons using the 3M, however the children cannot reach the board. It has endless possibilities, but many limitations because of the placement of the boards.

I pads would be useful in the primary classroom for interactive books and math.

I have had the opportunity to work with the ESL department using the IPads with my struggling readers and ESL students. This has been a huge success to use with intervention groups along with assisting the young language learners we encounter at the first grade level. I am not sure I will have the opportunity to do that again this year.

The evaluators agree with the user feedback that touch-screen devices (iPads and other tablet computers) would be more appropriate for lower grades than the Windows thin-client devices now prevalent across the district. Not only do students now enter the district (as young children) already knowing how to use iOS devices, but the fact that iPads do not focus on the use of keyboards or mice – input devices that are

difficult for very young children – would do much to encourage "hands on" use of technology by lower elementary students. The evaluators note that iPads (or similar devices) represent highly portable ways for any teacher or student at any grade to quickly and easily access networked information and to focus on communication, collaboration and sharing. At present, aside from some largely on their own initiatives, these sorts of technologies are not available to Sample District students and teachers.

The evaluators find that laptop carts exist in most schools and could represent a way bring technology into classrooms. Nevertheless, many of the cart computers are out of date (the same six-year-old devices that teachers use and have considerable difficulty with), suffer from a variety of network issues (see below), and no longer have any in-building support given the removal of the BRTs and IRTs. Thus, the laptops have acquired what can only be described as a "bad reputation" among many teachers. Teachers often have not attempted to use the laptops in several years but claim not to use them now because of problems experienced in the past. Teachers who are *currently* using the laptop carts seem to be able to work around many of the problems and are using the devices to bring computing into their classrooms. Once again, in Sample District the significant issue is not always "technology" but sometimes is more related to the communications surrounding technology. These are human factors and not entirely technical issues.

Survey and focus group data from parents shows a strong thread related to the need for better communication about what is happening at school with regard to technology:

> *If they are using it, there is no communication about it. I have no idea if or how my children use technology at school.*

> *More communication with the students and parents over how they are going to use technology and how it will benefit everyone.*

> *There is very little communication regarding what technologies are being used and what is available for the students to use, I feel.*

The issues of what devices are available and where they are available in the district goes to a general discussion about technology equity in Sample District. The evaluators find that equity looms large on the radar of the district's teachers, administrators and parents.

> *I am disappointed that upper grade levels like junior high and high school art classes are not equipped with a 3-M. Elementary art classes have these tools and it would be very effective to add 3-M's to the upper grade levels in order for the art teachers to promote the districts STEAM initiative especially since applied arts is an area of focus.*

> *One thing I struggle with.. iPads.. the equity issue it seems to get in the way. .. at some schools they share them and it kind of takes care of itself but at others there is no opportunity to use them or the teachers bring in their own. Not an equitable system*

The BYOD pilot in particular seems to bring the concern over equity to the fore for many teachers, parents, and administrators. The evaluators learned that for some administrators, inequities in student–owned equipment were considered barriers to more fully implementing the BYOD program in their schools. Teachers and administrators express reluctance to put students at a disadvantage if they don't

have devices to bring to school, even though no real data seems to exist about what percentage of the student body owns cell phones or personal computing devices.

Once again, the evaluators note that in a student-centered, project-based, learning environment where students take responsibility for their learning and teachers are more facilitators than directors, there are relatively few times that every student in a class would need to be computing at once. In small group work, students could share tasks and it would not be necessary for every student to have a computer. Likewise, if the emphasis in the class is on the learning objectives and not the process tasks that lead to fulfilling those objectives, then much of the focus on who has the technology – and when they have it – is eliminated.

Network and Administration

The evaluators find that Sample District's network is available in schools and offices throughout the district.[20] It appears that wired or wireless Internet access is available in nearly any location where connectivity would be desired. The district reports that utilization has not exceeded 70% of the total 175MB of bandwidth available this year. Nevertheless, there appear to be several issues – once again related to communication and policy – that impact usage of the district network.

First and foremost among these issues are the numerous teacher and administrator complaints that the network is slow and unreliable. The specific complaints varied as to whether the slowness was due to the age of the computer attached to the network (see above), or whether it was due to some sort of problem in the network itself. Regardless, comments such as the following are typical:

> *Technology is a HUGE part of everyday life so updating our technology in Sample District can help benefit students' learning. Our laptop cart is never used because the computers take FOREVER to work. The teacher computers do, too.*

> *Focus on the basic needs of the classrooms i.e. network speed.*

> *I attempt technologically integrated work each and everyday in class; however there are so many issues with the network, firewalls, etc.*

> *The problem of technology is the dependability of computers and network working. If I can not depend on the computers working than I don't use them as much.*

> *The technology is not reliable and it discourages us from using it… the guest network booting laptops off of the carts network, thus restricting student access, and the general availability of these resources make it difficult to access and use without frustrating both the teacher and student.*

On the particular issue of machines being "slow" to start up, it appears to the evaluators that the main issue here is that workstations (lab computers, laptops on carts, and teacher workstations) across the

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[20] With exceptions of course for temporary outages and the unavoidable existence of a few dead spots. Also, the evaluators are aware that the wireless network is segmented into several separate networks and that this causes difficulties for some users. These issues will be discussed later in this section of the findings.

network are constantly being automatically "upgraded" with software updates and (perhaps) virus definitions pushed out across the network. There is confusion among users as to the frequency of these updates. The district's technology department maintains that the updates only occur about once a month, yet users report that updates are attempted on nearly a daily basis (hence the slow booting each and every time a machine is restarted). The technology department recently reviewed update logs and found that several hundred machines were being scanned for updates nearly daily (due to a bug in the management system software), something that the technology department was unaware of. Once again, the underlying issue seems to not be a technical one but rather end-user confusion about policy and procedures and difficulties in communicating issues and problems from the school level. The end result is that users experience difficulties and have no satisfactory explanation of what has happened and what to expect. This generates uncertainty and a lack of trust that undermines the desire to use technology.

Another issue that a number of users noted in relation to the district's wireless network is that there are in fact separate networks for "guest" computers (which would include BYOD devices) and "laptop cart" computers. This causes some laptop cart users confusion in that the laptop cart network requires login through the district's network portal (in addition to login to the secured cart network Wi-Fi router). But once these logins occur, machines on the cart network can access the same resources that are available on the district's wired network. Users of the guest network have no login challenges but are restricted to access a more rigorously filtered WWW. Practically, this means that something like classroom storage or YouTube is *not* available on the guest network, but is available on the laptop cart network. While this makes sense from a security point of view, the problem is that a number of the laptop cart machines have lost the security credentials to access the cart network and therefore can only access the guest network. Likewise, in some locations the guest network routers overpower the laptop cart routers and thereby disable the use of the laptop cart network. When laptops cannot access the secured laptop network, teachers cannot guarantee that students can reach resources that might be part of a planned activity. Likewise, BYOD devices are often blocked from resources that a teacher wishes his/her students to use (requiring teachers to request access through the district's policy for gaining approval for opening up the filter).[21]

> To the district: You want me to use technology but I can't connect to the wireless system in the school? If I have more than 7 laptops connected, then they get kicked off the network.. I have 16 computers to use, but can't plan on it happening.. I just don't plan it…Why isn't our infrastructure set up in a way to handle these issues

The evaluators are aware that the district is currently working on restructuring its network infrastructure to better accommodate BYOD and therefore presumably how all portable (wireless) technologies access the network. It is clear that as this work progresses, users will need to learn about the new arrangements and adjust their expectations accordingly.

Finally, another issue often reported to the evaluators (and observed in schools across the district) that relates to the network is the lack of individual student storage space on the network. The evaluators found that the current network configuration makes no standard provision for students to store files or

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[21] The district's procedure for opening up the filter starts with a teacher request for access to a particular blocked site or resource. That request is sent to the building principal, who recommends to the district teaching and learning department that access be granted (or not). Then, teaching and learning reviews, and if the principal's positive recommendation is accepted, directs the Technology Department to open the firewall. Ultimately, word of this action is transmitted back down the chain to the teacher, who will be told that access to the site/resource is now available.

work on networked devices. Therefore, students must store their work on USB drives, which are either kept by the classroom teacher or transported by students. Not only do USB drives introduce the potential for viruses and piracy but they inhibit the ability for teachers and students to collaborate on shared files and user-created data. Some schools report that the district used to support local/network file storage, and later via the use of a cloud-based system called "Education Backpack".[22] Unfortunately, Backpack was a fee-based service and the district's subscription to the service was discontinued. The USB solution is a logical fallback position (and certainly reduces the network administration burden on district staff who do not need to maintain thousands of individual student logins at the district level), but it is at best a temporary solution and one which is not suitable for what the district ultimately wants – per its indicators – in terms of supporting the types of collaborative learning environments that the technology infrastructure should support.

Systems

Two systems are mentioned frequently in data from and discussions with Sample District teachers. These are the Teacher/School/Home Access Center[23] and Edmodo. The former is used to track student data (mostly as an electronic grade book, although much more sophisticated functions are available) and to make that data available to parents through the Home Access Center portal. The latter is a social networking site for schools.[24] The purpose of Edmodo is to allow teachers to set up class pages/sites that bring together students to access teacher-posted content and to engage in discussions with fellow students and the teacher.

The evaluators find that while nearly all teachers use the eSchool system, many teachers express some amount of discontent about the system.

> *TAC is a very slow program. It impedes my productivity every day that I work for Sample District.*
>
> *Simple orientation on TAC would have been nice. NO one has every shown me how to use the system. I don't even know where to go if I have a question about it.*
>
> *I have had no training in TAC and am now responsible for putting in grades and assignments. Administrators have told me to go to the teachers, but I hate to do that because they are so busy..*
>
> *My teaching computer is over 10yrs old. It takes 45min to get TAC up for attendance.*

Much of this teacher discontent seems to focus on general problems with accessing system features. While it seems that most teachers know how to use the basic grade book functions, not all teachers know how to use the more advanced features – many of which relate to porting information out of Teacher Access Center (the grade book) into Home Access Center where information can be accessed by parents.

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[22] The evaluators note that local storage is by no means a special feature of Apple networks – particularly not modern networks – and that similar solutions exist on Windows or other OS-based networks. Further, while it may be true that other file storage solutions do exist on Sample District's network, it is definitely the case that teachers are unaware of these solutions.

[23] These are 3 interconnected modules of the eSchool Plus student information system. http://www.sungard.com/campaigns/corporate/k12/products/plus360_eschoolplus.aspx

[24] http://about.edmodo.com/

This leads to the often heard parent comment that while Home Access Center is great, it depends on the individual teacher to keep the information updated. The evaluators understand that most teachers are keeping their student information updated, but not all teachers take the time to manually move information into the Home Access Center. The evaluators are not able to determine if there are any particularly ongoing technical problems related to basic teacher use of Teacher Access Center (although like any online system there are no doubt instances where the system is down). Rather, it is more likely that teacher problems with the system result from insufficient/misconfigured workstations or various transient networking problems. Teacher Access Center as a student data system seems to be very full featured and widely adopted by schools across the country.

The complexity of Teacher Access Center – combined with the fact that not all teachers are aware of how to access district training on the system and that there is no official in-building technical support for the system – no doubt contributes to the fact that not all teachers take the effort to move information to Home Access Center (HAC). Also, it is clear that Home Access Center is not the same as a class or school "web page", something that some teachers and parents wish it to be.

> *Sample District's decision to eliminate Edline and replace it with HAC a joke. Sample District fails on several fronts when it comes to technology. I have stopped trying to incorporate technology into my lessons because it is more trouble than it is worth.*
>
> *HAC does not provide enough information and does not provide an adequate format for parent/teacher communication. Edline was better. If assignments could be available to parents/students online, it would be very helpful. Also, listing the appropriate online resources relevant to class content.*
>
> *My husband and I believe the district needs to commit itself to going paperless, but the syllabi need to be posted on HAC--and the directive has to come from the district level, not building leaders...and we already are people who would support the levy. Mason and other renowned school districts in the area already do this.*
>
> *I would like to see some of the worksheets used in class posted to HAC so that in the younger grades ex. 2nd grade parents have access to items to practice at home.*
>
> *I really like HAC for example, but not all the teachers are actually USING it in a way that can improve my daughter's performance at school. I've had some very frustrating encounters with teachers who don't input information, like assignment due dates and critical grades until there is no time for my daughter to learn from her mistakes and we parents have no info to help keep her on track.*
>
> *Right now, my child has teachers using HAC, Edmodo, Facebook, Shutterfly, and individual webpages for assignments, information dissemination, etc. It becomes very confusing and cumbersome to check 5 different sites daily to keep abreast of assignments, etc.*
>
> *Put daily talking points from each class on HAC, so the students have the information to review to during the evening/weekend hours when completing school work at home.*

HAC does not provide enough information and does not provide an adequate format for parent/teacher communication. Edline was better.

It seems that Edmodo has become the some teachers' current solution for the creation of class web-pages. As a free service, it has essentially replaced the district's use of Edline, which the district used to hold a subscription for (now since discontinued). Unfortunately, Edmodo is not the same thing as Edline. Edline is designed to produce class pages that focus on sharing teacher-produced content. It is a widely implemented school solution that has more functionality than simply producing class web pages or school web sites. Edmodo on the other hand is more like a Moodle or a social networking site. One of the primary selling points of Edmodo is that it is a closed conversation, composed of only those individuals (students) who are granted access to the class site created by a group leader (the teacher). Access to an Edmodo class site is by invitation only. The primary problem here is that it is somewhat difficult for parents to casually access their child's Edmodo class page, and when they do access the page, it turns out that what the system is really set up for is conversation (around content – such as assignments – that the teacher has posted). But when taken for what it is supposed to do – to allow student and teacher social networking around posted content – Edmodo appears to work very well.[25]

Technical Support

There is no technology support in the building anymore. We don't have a go-to person in the bldg. where that's there job. Of course that's money too.

I was able to do this more when we had a media instructor that could support my technology and software needs. The thin clients do not allow for anything other than PPT presentations. The students used to create documentaries using Flip cameras and Movie Maker, these things are no longer available to us.

There is no point in updating our technology if we are not also provided with the personnel to support us when it goes wrong! Our tech support people are great but severely overworked and stretched far too thinly.

As the quotes above show, there are concerns in schools around the district about the availability of technical support. While the evaluators found that many teachers had very positive things to say about the technicians who service their building, it is also the case that most teachers and administrators feel that there are more problems to solve than can be addressed by the six available technicians.

I see our guy every once in a while and I don't know where he goes. Are they assigned to a building? We should be allowed to approach them and ask questions and not just when we have a tech form.

I feel bad for the tech department because they have to come out and do things that I could do myself if I just had the privileges.

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[25] The evaluators note that it is possible for parents to log on to Edmodo if they use an access code provided by their student. This student-based control is a child protection feature of Edmodo built into its system and simply underscores that the site is intended to be social media, sharing, among class *participants* and not a site for posting information for individuals who are not teachers or students.

Sample District Schools
Instructional Technology Evaluation

Sun Associates, 2012

The evaluators have already discussed the fact that there are no building technology or instructional technology representatives in the buildings. No one at the building level is in fact charged with offering instructional *or* minor technical support to teachers. One ramification of this situation often discussed by Sample District teachers is that there is no one at the building level who can address basic networking, password, or desktop configuration issues. This seems to be particular bothersome to teachers as once the BRTs were eliminated, the technology department is stated to have changed the passwords on everything so as to keep building staff (e.g. the former BRTs) from accessing those systems that they had previously had privileges to access.

The evaluators do not have data on help desk volume or average ticket time to resolution. Teachers report that the help desk is functional (albeit a bother to have to call relative to having someone in-building to address minor problems) and that technicians are often in the buildings. In interviews, a number of teachers complained of equipment that required multiple technician visits to repair and of some equipment that remained out of service despite multiple service requests. The evaluators observed non-functional equipment in classrooms, labs, and on laptop carts. Nevertheless, it is hard to determine simply from observation or teacher report just how problematic – or unresolved – these technical support issues are. In any network the size of Sample District's – particularly with the advanced age of most of the equipment – some downtime is to be expected and it is not clear that Sample District's situation is any worse than average.

Community

Sample District's indicator for community states that:

The community understands, supports, and can articulate the district's vision for technology, which is focused on how technology supports learning and learning outcomes. The district implements its vision in partnership with the broader community through ongoing collaboration with the school district. Parents can make the connection between technology and what it enables their children to do, and partner with the schools around supporting students and their use of technology. There exists a strong connection between the district and the local business community around the development of student and teacher technology and learning skills.

Sample District's last indicator is intended to assess the degree to which the district's instructional technology vision and actions, connect to its broader community. The emphasis here is on the degree to which the community can identify with the vision as well as how well the district utilizes the community as a resource for enacting its vision.

The evaluators surveyed and conducted focus groups of parents with students at all levels. Many parents expressed the opinion that their students do not have sufficient access to technology and most specifically they did not have any idea what the district's "vision" was for the role of technology in learning. This survey data is summarized in Figure Twelve, below.
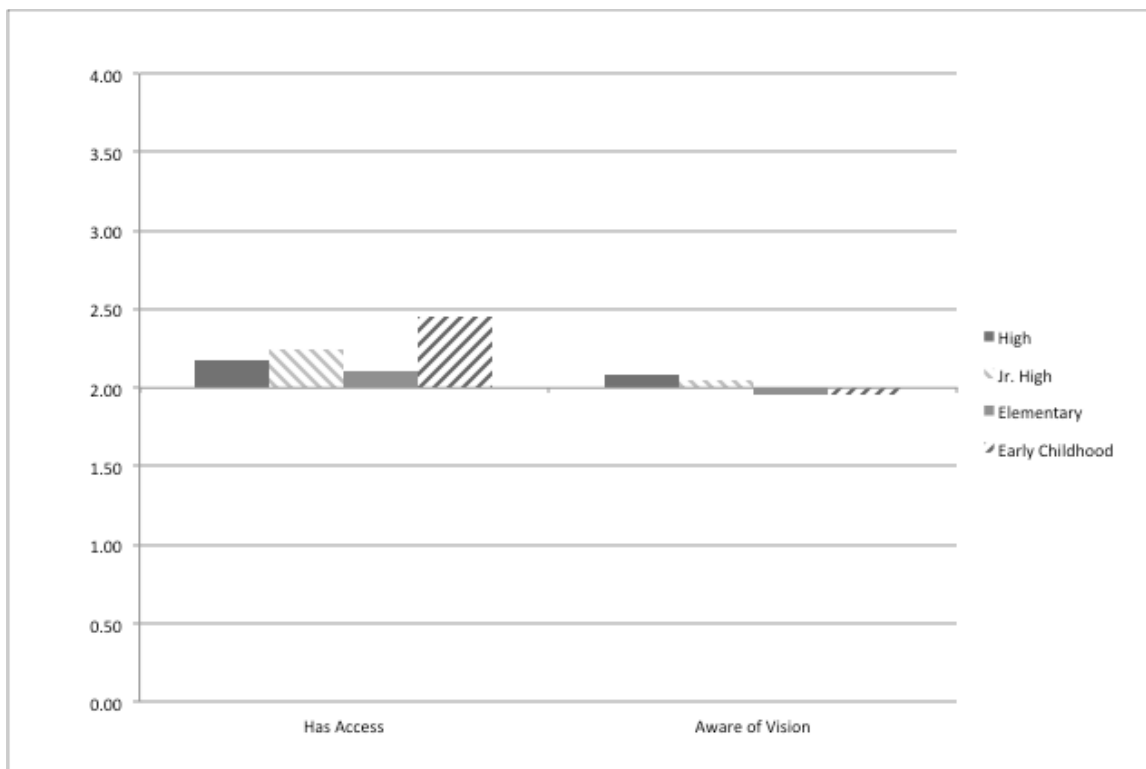

Figure Twelve – Parent agreement that their students have access to technology at school and that they (parents) are aware of Sample District's vision for technology. (Scale – 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree) Parent questions 3f and 3i.

The evaluators note that there is no need to belabor the point made repeatedly in these findings that Sample District's vision for technology is not well communicated to its community. Clearly the majority of the parents the evaluators spoke with, while not at all in disagreement with the district, were nonetheless not familiar with the vision.

The same point can be made about the non-parent community. Although very few responses were received from the community survey (so few as to make the responses clearly a non-significant sample), virtually no respondent indicated any knowledge of the district's direction regarding instructional technology. A number of these responses nonetheless made the point that the district should have more technology available to students and that technology was an important part of the educational environment.

The evaluators have no direct information about the degree to which the local business community supports the district's vision. This topic was not researched as the district felt that such connections would be explored as part of a larger community data-gathering effort.

III. Recommendations

The evaluators have a number of recommendations for Sample District Schools that serve to address the evaluation findings detailed in the previous chapter. These recommendations are organized within two categories. The first category relates to how the district should organize its effort to position technology within the broader range of teaching and learning initiatives active within the district and on the nationwide educational stage. This has much to do with the basic finding around leadership, vision, and communication. The second category of recommendations relates to specific goals and actions that the district should address in its Strategic Technology plan.

Engage the District with Sample District's Vision

In order for Sample District Schools to realize its vision for technology-supported teaching and learning, it must begin to establish policies, make decisions, and develop strategic plans in accordance with that vision. The evaluators recommend that the district make a concerted effort to communicate to all Sample District teachers, administrators and parents its message about the direction that the district is going with its technology efforts, including how those efforts coordinate with other district initiatives. All staff must be provided opportunities to engage with the vision for transformed teaching and learning, and must be held to a high standard for technology integration within the context of ongoing support and coordinated, strategic decision-making.

The evaluators recommend that Sample District Schools create a district-wide technology steering committee composed of district and building-level staff. Included in this group should be representatives from the current curriculum consultant team, principals, and the group of central office staff who oversaw the creation of the district's technology indicators/vision. This committee should be a standing committee in the district which has as its primary responsibility the bringing together of district staff and key stakeholders to manage and nurture the district's comprehensive vision for teaching and learning that leverages new and existing technologies, The first task for the district technology committee should be to create the district's strategic technology plan. This work will be facilitated by Sun Associates, and will be guided by the findings and recommendations in this evaluation report.[26]

The overall emphasis of the strategic technology plan should be to develop a district-wide consensus on how to achieve the district's vision for technology through the coordination of existing curricular initiatives and the support of technology tools. Positioned properly, the strategic technology plan can become the "horizontal theme" that ties together the various "silos" (e.g., Common Core, Technology, STEM) identified in the Findings of this report. In order to accomplish this task, the district must first engage the various leaders of these initiatives in a way that encourages the identification of common ground and pursuit of integrated solutions. That will be the purpose of the technology committee and the work of technology planning.

The evaluators note that the technology committee should continue to meet on an ongoing basis and participate in regular professional development opportunities. This will insure that the district's

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[26] This work is part of Sun Associates' existing contract with the district.

stakeholder-based technology leadership stays current in best practice around how technology connects to the broad range of pressing teaching and learning trends and initiatives impacting school districts nationwide. Appropriate activities for such a committee (that are in line with what the evaluators have seen in many other districts) are attending state and national conferences such as eTech State and the ISTE national conferences. It is also often useful for such committees to work with management and leadership development consultants so as to further develop leadership and coordination skills.

Develop a Coordinated Strategic Technology Plan

As stated above, the district's first priority should be to engage its broad community of stakeholders with its vision for technology. A key, and high priority, aspect of this work will be to create a district technology committee that develops a truly strategic technology plan. That plan should address a number of the specific findings of this evaluation report.

Staffing

The Role of the District Technology Coordinator

The evaluators recommend that the district ground its building-based instructional technology support in a district technology organization led by a District Technology Coordinator (DTC) who is part of the district's on-going discussion around teaching and learning. The DTC needs to have equal skills in managing and supporting instructional technology integration strategies as well as issues of network infrastructure. Likewise, the DTC would ideally have instructional as well as technical staff within his/her organization.

The evaluators believe that there are several different administrative arrangements that would service Sample District's instructional technology needs, but the essential areas to cover are:

- The DTC should supervise the Instructional Technology Specialists who work with elementary, junior high, and high school teachers. It is critical that these Specialists be effectively coordinated at the district level.
- The DTC should be primarily focused on *instructional* technology issues. While it is also important for the DTC to coordinate the district's efforts in student information systems and other MIS functions, it should be realized that the DTC is the chief technology officer of an enterprise that has student learning outcomes at the core of its business. Therefore, the DTC has to be specifically skilled in instructional issues.
- The DTC should ideally be at the "assistant superintendent" level, meaning that s/he reports directly to the Superintendent and participates in all organization discussions regarding key issues of teaching and learning.

As noted, it is possible to achieve these best practice recommendations in a variety of ways. Some districts have a multi-tiered approach to staffing the technology department that has a DTC with two subsidiary staff – one who oversees Instructional Technology and another who oversees the technical infrastructure.

Provide Building Level Instructional Technology Support

Sample District must re-institute some level of building-based instructional technology support. In keeping with best practice for technology integration (see the ISTE NETS "Essential Conditions" in the Appendix) there should be someone in each building who functions in the role of instructional technology specialist. The Instructional Technology Specialist should be primarily an instructional position that focuses on curriculum and instruction and the particular ways to bring technology into this mix. Ideally, and in keeping with best educational practice as implemented in schools nationwide, in a district the size of Sample District, one would expect to find full-time technology specialists who spend at least half-time in each elementary building (full time for junior highs and high schools). Standard guidelines for ITS staffing call for between eight to 15 full time ITS for a faculty the size of Sample District's.[27] Nevertheless, given the realities of Sample District's current economic conditions, it would be reasonable for the district to make a start toward reaching best practice by empowering *staff currently working in schools* to perform the core functions of an ITS. Specifically, each building needs at least one of these individuals who will help teachers find instructional resources, develop classroom/learning activities, and model technology-infused learning activities.[28] These ITS positions – that could be filled by existing teachers given at least a one-period release – would be responsible for delivering the sort of job-embedded, highly differentiated, professional development that Sample District's teachers desperately want and need. The ITSs would also be responsible for overseeing, and instructionally supporting, the various pilot projects such as iPad initiatives and BYOD projects (as well as future pilots) that the district has a keen interest in developing across buildings.

It would be important for the ITSs to meet regularly with each other, the District Technology Coordinator, and the district technology committee (some ITSs would be members of the district technology committee) so that they could work as a focused, cohesive, unit dedicated to communicating and implementing the district's vision for technology in all Sample District schools.

Provide Additional Technology Department Support

As the district ultimately expands the availability of technology systems and resources (see recommendations below) as well as teacher use of technology, it is quite likely that the district's existing technical staffing levels will become dramatically insufficient. While State does not have state guidelines in such matters, the evaluators note that typical state guidelines in other states call for technical staffing at the rate of one technician per 400 computers.[29] Given Sample District's current numbers (6000 computers), this would call for 15 technicians.

Develop Student Skills

The evaluators recommend that the district develop student technology skills through the creation of a technology skills scope and sequence that would guide classroom teachers in their understanding of what skills are appropriate by grade level and curriculum area. In addition, the evaluators recommend

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[27] The School Technology and Readiness (STaR) Chart – a set of benchmarks for schools to reach "advanced" states of technology readiness – calls for a 0.5 FTE Instructional Technology Specialist for every 30 to 60 district staff (teachers). The STaR Chart has been adopted by several states as set of non-binding guidelines for local technology planning. http://etac.tecedge.net/ provides details on Massachusetts' version of the STaR Chart.

[28] See the NETS-C standards in the Appendix for an example of what an Instructional Technology Specialist would focus on.

[29] See the STaR chart.

that the district continue and expand its efforts to insure basic student "foundation" technology skills through technology classes at the elementary and junior high levels.

Scope and Sequence

The evaluators recommend that the district create a scope and sequence for student technology skills. Beyond the work of developing the district's strategic technology plan, this should be the initial work of the district technology committee. This work could well take the shape of a "mapping" of student uses of instructional technology onto grade-level curriculum and the Common Core standards. A good place for starting to look at the technologies that would inform such a mapping would be the ISTE NETS Student Profiles (see Appendix). This would provide a sound basis for discussion by the district technology committee and various district stakeholders (teachers, parents, administrators, etc.) who would generate a final scope and sequence document.

Once a scope and sequence is adopted, teachers in all buildings must be made are aware of and competent in developing the student skills appropriate for their grade/subject. Curriculum units and activities need to be integrated with appropriate technology skills. All principals need to be aware of the scope and sequence and the curriculum connections in order to facilitate collaboration within the building, set appropriate expectations, and keep parents informed as to the competencies that students develop.

The considerable professional development and curriculum integration work associated with implementing a scope and sequence would naturally be the focus of the district's Instructional Technology Specialists' work. Here, the evaluators recommend that the ITS focus on working with classroom teachers with their students within their classrooms. The intention is that with the ITSs' job embedded professional development assistance, classroom teachers will start to understand technology integration as something that happens within the context of their regular curriculum.

In many ways, the scope and sequence, like the district vision for technology, is a cornerstone for all future technology work in the district. The scope and sequence is in fact the articulation of the vision in so far as it sets clear expectations for what students will do with regard to the use of technology within the learning environment. Further, the scope and sequence (with the emphasis on "sequence") enables teachers at each grade level to proceed with confidence, knowing that their students will have the necessary foundations to accomplish the new learning activities demanded of them. Finally, the scope and sequence can be the driver for teacher professional development in that it establishes clear expectations for what teachers need to be able to do to support the technology needs of the learning activities in their grade/subject.

Give Attention to Information and Media Literacy

At the present time, there seems to be no organized instruction in information or media literacy. This seems to largely be the result of the elimination of the library media specialists several years ago. While this technology evaluation cannot necessarily make recommendations about the libraries, the evaluators note that information literacy is a core skill in NETS. As such, those media literacy skills that parents and others find lacking among students in Sample District would naturally be included in a NETS-oriented scope and sequence. Likewise, within a curriculum that emphasizes 21st century learning and the 4Cs, students would engage in activities designed to develop some of the same critical thinking skills needed for effective information literacy. Nevertheless, in the interim, before reaching this ultimate

curricular vision, there is value in insuring that Sample District students have developed specific skills in effective online research and ethical use of technology (e.g., emphasis on how to avoid plagiarism) particularly in light of the district's efforts to support BYOD. Traditionally, these skills – if they are taught outside the classroom – are taught in the library. Since Sample District students no longer have a structured approach to library skills, they simply are not getting this instruction. Therefore, this needs to be picked up in the classroom, or in the Technology Applications class. It does not seem to be acceptable that Sample District students either receive no instruction in this area or only haphazard instruction as currently seems to be the case.

Continue the Junior High Technology Applications Class

The evaluators recommend that the district continue the junior high "Technology Applications" class that is currently taught in 7th or 8th grade. Particularly under the current circumstances of no organized technology curriculum in elementary schools, it would be a mistake to eliminate the Technology Applications course and thereby cut most students off from formally learning any basic applications.

As the district continues the junior high Technology Applications class it will be important to continually evaluate the relevancy of its curriculum. While the evaluators feel that the course will likely be necessary for the foreseeable future, it may well need to be revised as students begin to acquire more technology skills in elementary schools (which will be the expected outcome of providing Instructional Technology Specialist support to elementary teachers and with the creation of a K-12 technology skills scope and sequence). Likewise, as technologies change, the specific tools and applications that the Technology Applications course focuses on should change.

Develop New Approaches to Professional Development

As the findings detail, Sample District teachers need a considerable amount of professional development in both individual subjects/initiatives (e.g. technology tools, creating successful student projects) as well as on more cross-cutting topics that can serve to knit together a variety of initiatives. An example of the latter is how training on the Common Core *ought* to be as should be the case with student-centered learning and technology. Professional development that encourages synthesis (versus working in vertical silos) is an excellent way of communicating the message that initiatives fit together horizontally.

The professional development role of the ITS has already been discussed. Likewise, the evaluators have pointed out the need to make technology integration a cross-cutting theme in other district professional development such as that offered by the Curriculum Consultants. It is also important to recognize that the best way to support this horizontal message is via reflection, modeling, and discussion; it is clear that "workshops" will not suffice as a primary way to support Sample District teachers. Workshops often do an adequate job of teaching very specific (siloed) tasks/skills but they do not address the highly personal concerns highlighted in research such ACOT. Therefore, the district needs to explore ways that building leaders can encourage teachers to incorporate discussions about technology, and reflections on curriculum-embedded uses of technology, into teacher planning and meeting time. The district needs professional development around technology that is hands-on and supportive of the notion that technology use by teachers and students is part of the very fabric of work in Sample District Schools.

Address Infrastructure Issues

Finally, there are a wide range of technology infrastructure-related issues that the evaluators recommend that the district ultimately address as part of its long range strategic technology plan. Once again, most of these issues will require the allocation of fiscal resources and as such cannot really be addressed until the district *first* improves its ability to organize the entire community around the vision for technology's central role in teaching and learning.

Networking and Devices

Bandwidth -- The district should increase the bandwidth of its connection to the Internet. At present, the district's connection runs at 175MB. The "industry standard" target for school district network connections to the Internet is 100MB per 1000 students and faculty.[30] This would mean that the district needs about a 1.5GB connection, which is ten times the current amount of bandwidth. While the district can arguably get by with the current connection *now*, that is largely the case because there are very very few high-bandwidth uses of the Internet currently occurring in Sample District schools. If the district wants network usage to even begin to approach its vision for student/teacher use of technology, clearly much more bandwidth will be required.

Complete/Revise the Wireless Network – The evaluators recommend that the district simplify and streamline access to the district's wireless network. The overall effect for end users should be a district-wide wireless presence that can be accessed anytime and anywhere. Users should not need to worry about which network their device *should* attach to. Wireless networking should be available in all places, in all buildings, at all levels.

Increasing network bandwidth to industry-standard levels and the concurrent simplification (and full expansion to all building areas) of the wireless networking infrastructure are two important steps that the district can take to make its BYOD policy a practical reality for all students in the district.

Teacher Workstations – Sample District teachers need modern computers as tools for personal/professional productivity. The evaluators recommend that the district evaluate and approve several standard configurations of teacher network access device. At minimum, each teacher should be provided with a modern network access and computing device such as a touch screen tablet or a full-scale laptop. Whatever the decision as to particular device, the evaluators recommend that teachers be provided with *new* devices (not refurbished devices moved down other grade levels or repurposed) and that the decision as to what to provide be driven by curricular and instructional principles.

Develop A Plan for Student 1:1 Access – The evaluators recommend that the district move a step beyond the current BYOD policy and institute a policy that calls for student 1:1 access to technology. This means that the district should develop a basic standard for student computing devices and a range of ways for students to have access to devices that meet the standard. Included in this "range of ways" would be:

- A standard for what types of BYOD devices can and should be brought to school if a student is able to bring their own device to school.
- A program for students and their families to obtain appropriate devices for student ownership. This plan should have a sliding subsidy scale so that students of lesser means (e.g. free and

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[30] SETDA's "Broadband Imperative" - http://www.setda.org/web/guest/broadbandimperative - recommends this target amount for the 2014/2015 school year.

reduced lunch eligible) can pay very little whereas students of greater means can pay proportionally more.

- A certain number of "school owned" devices available at every school so that those students who for some reason do not have their own device will still have access to a device to use while in the school building. School owned devices would not leave the building.

The evaluators recommend that the district pursue solutions that provide a common user experience and environment - so that all devices – BYOD, leased, school-owned – would have access to the same set of network services when attached to the Sample District Schools network.

Systems and Software

Edmodo – The evaluators recommend that the district encourage all staff (certainly from upper elementary into high school) to establish Edmodo groups for their classes. This encouragement would come by incorporating Edmodo support into the district's help desk and in offering district professional development in use of the system. Of course, this too becomes something that the district needs to communicate (see previous recommendations concerning improving district communications).

Edline – The district should provide a standard system for the creation of publically accessible class and school websites. Such a system would help improve communication between home and school and would exist alongside the district's online class work domain (Edmodo) and its student performance information system (Home Access Center).

Cloud-Based Computing Environment – The evaluators recommend that the district adopt a cloud-based computing environment and establish the procedures and technology department staffing to routinely establish and administer student accounts.[31] Doing this will enable the district to make use of a powerful collaboration and productivity environment available anywhere, anytime. To use an analogy, the cloud could be the "roadway" upon which the district's BYOD devices/"vehicles" drive. With a cloud-based service, any device that has network access also has the ability to create and share documents/information in the cloud. This becomes a powerful tool for educators who can leverage this to meet many of the NETS standards and much of the district's vision for technology in learning.

eSchool/Teacher Access Center/Home Access Center – The evaluators recommend that at least for the time being the district should continue to use eSchool. While the evaluators heard a number of teacher and parent complaints about the system, it is clear that the majority of these issues relate in fact to insufficient teacher workstations and lack of training and support. In this regard, the evaluators recommend that the district offer more support to classroom teachers in the use of eSchool and that this support be focused on training around porting TAC information into HAC.

Standardize Instructional Software Licenses –The technology committee needs to accumulate information about what software exists in its schools, license all software at the district level, and then communicate the information about those licenses do all schools. The evaluators caution that the emphasis of this effort must be to *increase* the availability of software and not to restrict schools to the use of a few "approved" packages. Likewise, the district needs to insure that the process of choosing instructional software rest with teachers and administrators (ideally via the district technology

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[31] The main issue here is that each student – just like each teacher/staff person now – needs a unique email address and this will require Technology Department staffing to support.

committee, see recommendation above). Instructional software choice is not predominantly a "technical" issue.

Formalize the Investigation Around Blended Learning

As part of its investigation into how to create systems that support online learning, the evaluators recommend that the district examine how "blended learning" could be used to the advantage of Sample District's students. The evaluators recommend a policy study approach because so much of what is involved in a district movement to blended learning is very far beyond the district's *current* capacity to incorporate and manage such an approach to learning.

In order to make a successful move toward a blended learning approach, the district needs to put forward its vision of pedagogy that is much more student-centered and far removed from the heavily teacher-directed, computer-based-instruction, model of online courses used in the district. In order to grow from the current situation/policy to something approaching the modern definition of "anywhere-anytime, online-in person, *blended* learning", the district needs to instigate some baby-step pilot projects. Designing these pilots and crafting the policy that surrounds them, is something that will involve close collaboration between teaching and learning staff and technology staff. The recommended DTC and district technology committee would be charged with this task.

The evaluators believe that, at this point in time, it is premature to be talking about details such as selecting learning management systems or online content providers. So much of the teaching and learning technology infrastructure still remains to be built. Nevertheless, it is clear that in Sample District – as in schools everywhere – teaching and learning will need to move to more flexible, expansive, and blended models. It is thus fortunate that this is within the district's vision. It is just necessary for the district to do the groundwork to first "prepare the field" for something like blended learning to take root. The best way to do this is to consider the full scope of the recommendations in this report within the context of a district-wide strategic plan, and *then* to develop the policies and practices to move further ahead.

IV. Appendices

NETS Standards

NETS - S

1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

   a. Apply existing knowledge to generate new ideas, products, or processes
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
   d. Identify trends and forecast possibilities

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   c. Develop cultural understanding and global awareness by engaging with learners of other cultures
   d. Contribute to project teams to produce original works or solve problems

3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information.

   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results

4. Critical Thinking, Problem Solving, and Decision Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

    a. Identify and define authentic problems and significant questions for investigation
    b. Plan and manage activities to develop a solution or complete a project
    c. Collect and analyze data to identify solutions and/or make informed decisions
    d. Use multiple processes and diverse perspectives to explore alternative solutions

5. Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

    a. Advocate and practice safe, legal, and responsible use of information and technology
    b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
    c. Demonstrate personal responsibility for lifelong learning
    d. Exhibit leadership for digital citizenship

6. Technology Operations and Concepts

Students demonstrate a sound understandingof technology concepts, systems, and operations.

    a. Understand and use technology systems
    b. Select and use applications effectively and productively
    c. Troubleshoot systems and applications
    d. Transfer current knowledge to learning of new technologies

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NETS - T

1. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

   a. Promote, support, and model creative and innovative thinking and inventiveness
   b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources
   c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes
   d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

2. Design and Develop Digital Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

   a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
   b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress
   c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources
   d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

3. Model Digital Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

   a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
   b. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation
   c. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats
   d. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

    a. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources

    b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources

    c. Promote and model digital etiquette and responsible social interactions related to the use of technology and information

    d. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools

5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

    a. Participate in local and global learning communities to explore creative applications of technology to improve student learning

    b. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others

    c. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning

    d. Contribute to the effectiveness, vitality, and self- renewal of the teaching profession and of their school and community

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NETS - A

1. Visionary Leadership

Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization.

   a. Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders
   b. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision
   c. Advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan

2. Digital Age Learning Culture

Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.

   a. Ensure instructional innovation focused on continuous improvement of digital-age learning
   b. Model and promote the frequent and effective use of technology for learning
   c. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners
   d. Ensure effective practice in the study of technology and its infusion across the curriculum
   e. Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age collaboration

3. Excellence in Professional Practice

Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.

   a. Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration
   b. Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology
   c. Promote and model effective communication and collaboration among stakeholders using digital age tools
   d. Stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning

4. Systemic Improvement

Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources.

    a. Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources
    b. Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning
    c. Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals
    d. Establish and leverage strategic partnerships to support systemic improvement
    e. Establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning

5. Digital Citizenship

Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.

    a. Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners
    b. Promote, model and establish policies for safe, legal, and ethical use of digital information and technology
    c. Promote and model responsible social interactions related to the use of technology and information
    d. Model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools

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NETS - C

1. Visionary Leadership

Technology Coaches inspire and participate in the development and implementation of a shared vision for the comprehensive integration of technology to promote excellence and support transformational change throughout the instructional environment.

a. Contribute to the development, communication, and implementation of a shared vision for the comprehensive use of technology to support a digital-age education for all students

b. Contribute to the planning, development, communication, implementation, and evaluation of technology-infused strategic plans at the district and school levels

c. Advocate for policies, procedures, programs, and funding strategies to support implementation of the shared vision represented in the school and district technology plans and guidelines

d. Implement strategies for initiating and sustaining technology innovations and manage the change process in schools and classrooms

2. Teaching, Learning, & Assessments

Technology Coaches assist teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students.

a. Coach teachers in and model design and implementation of technology-enhanced learning experiences addressing content standards and student technology standards

b. Coach teachers in and model design and implementation of technology-enhanced learning experiences using a variety of research-based, learner-centered instructional strategies and assessment tools to address the diverse needs and interests of all students

c. Coach teachers in and model engagement of students in local and global interdisciplinary units in which technology helps students assume professional roles, research real-world problems, collaborate with others, and produce products that are meaningful and useful to a wide audience

d. Coach teachers in and model design and implementation of technology-enhanced learning experiences emphasizing creativity, higher-order thinking skills and processes, and mental habits of mind (e.g., critical thinking, meta-cognition, and self- regulation)

e. Coach teachers in and model design and implementation of technology-enhanced learning experiences using differentiation, including adjusting content, process, product, and learning environment based upon student readiness levels, learning styles, interests, and personal goals

f. Coach teachers in and model incorporation of research-based best practices in instructional design when planning technology-enhanced learning experiences

g. Coach teachers in and model effective use of technology tools and resources to continuously assess student learning and technology literacy by applying a rich variety of formative and summative assessments aligned with content and student technology standards

h. Coach teachers in and model effective use of technology tools and resources to systematically collect and analyze student achievement data, interpret results, and communicate findings to improve instructional practice and maximize student learning

3. Digital Age Learning Environments

Technology coaches create and support effective digital-age learning environments to maximize the learning of all students.

a. Model effective classroom management and collaborative learning strategies to maximize teacher and student use of digital tools and resources and access to technology-rich learning environments

b. Maintain and manage a variety of digital tools and resources for teacher and student use in technology-rich learning environments

c. Coach teachers in and model use of online and blended learning, digital content, and collaborative learning networks to support and extend student learning as well as expand opportunities and choices for online professional development for teachers and administrators

d. Select, evaluate, and facilitate the use of adaptive and assistive technologies to support student learning

e. Troubleshoot basic software, hardware, and connectivity problems common in digital learning environments

f. Collaborate with teachers and administrators to select and evaluate digital tools and resources that enhance teaching and learning and are compatible with the school technology infrastructure

g. Use digital communication and collaboration tools to communicate locally and globally with students, parents, peers, and the larger community

4. Professional Development & Program Evaluation

Technology coaches conduct needs assessments, develop technology-related professional learning programs, and evaluate the impact on instructional practice and student learning.

a. Conduct needs assessments to inform the content and delivery of technology-related professional learning programs that result in a positive impact on student learning

b. Design, develop, and implement technology-rich professional learning programs that model principles of adult learning and promote digital-age best practices in teaching, learning, and assessment

    c.   Evaluate results of professional learning programs to determine the effectiveness on deepening teacher content knowledge, improving teacher pedagogical skills and/or increasing student learning

5. Digital Citizenship

Technology coaches model and promote digital citizenship.

    a.   Model and promote strategies for achieving equitable access to digital tools and resources and technology-related best practices for all students and teachers

    b.   Model and facilitate safe, healthy, legal, and ethical uses of digital information and technologies

    c.   Model and promote diversity, cultural understanding, and global awareness by using digital-age communication and collaboration tools to interact locally and globally with students, peers, parents, and the larger community

6. Content Knowledge and Professional Growth

Technology coaches demonstrate professional knowledge, skills, and dispositions in content, pedagogical, and technological areas as well as adult learning and leadership and are continuously deepening their knowledge and expertise.

    a.   Engage in continual learning to deepen content and pedagogical knowledge in technology integration and current and emerging technologies necessary to effectively implement the NETS·S and NETS·T

    b.   Engage in continuous learning to deepen professional knowledge, skills, and dispositions in organizational change and leadership, project management, and adult learning to improve professional practice

    c.   Regularly evaluate and reflect on their professional practice and dispositions to improve and strengthen their ability to effectively model and facilitate technology-enhanced learning experiences

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ISTE NETS Essential Conditions

Necessary conditions to effectively leverage technology for learning.

Shared Vision	Proactive leadership in developing a shared vision for educational technology among all education stakeholders, including teachers and support staff, school and district administrators, teacher educators, students, parents, and the community
Empowered Leaders	Stakeholders at every level empowered to be leaders in effecting change
Implementation Planning	A systematic plan aligned with a shared vision for school effectiveness and student learning through the infusion of information and communication technologies (ICT) and digital learning resources
Consistent and Adequate Funding	Ongoing funding to support technology infrastructure, personnel, digital resources, and staff development
Equitable Access	Robust and reliable access to current and emerging technologies and digital resources, with connectivity for all students, teachers, staff, and school leaders
Skilled Personnel	Educators, support staff, and other leaders skilled in the selection and effective use of appropriate ICT resources
Ongoing Professional Learning	Technology-related professional learning plans and opportunities with dedicated time to practice and share ideas
Technical Support	Consistent and reliable assistance for maintaining, renewing, and using ICT and digital learning resources
Curriculum Framework	Content standards and related digital curriculum resources that are aligned with and support digital age learning and work
Student-Centered Learning	Planning, teaching, and assessment centered around the needs and abilities of students
Assessment and Evaluation	Continuous assessment of teaching, learning, and leadership, and evaluation of the use of ICT and digital resources
Engaged Communities	Partnerships and collaboration within communities to support and fund the use of ICT and digital resources
Support Policies	Policies, financial plans, accountability measures, and incentive structures to support the use of ICT and digital learning resources for learning and in district school operations
Supportive External Context	Policies and initiatives at the national, regional, and local levels to support schools and teacher preparation programs in effective implementation of technology for achieving curriculum and learning technology (ICT) standards

NETS – S Student Profiles

A major component of the NETS project is the development of a general set of profiles describing information and technology (ICT) literate students at key developmental points in their precollege education. The profiles highlight a few important types of learning activities students might engage in as the new NETS•S are implemented. We hope these examples will bring the standards to life and demonstrate the variety of activities possible. The profiles are divided into four grade ranges. Because grade-level designations vary in different countries, we also provide age ranges.

The numbers in the parentheses after each item identify the standards (1–6) most closely linked to the activity described. Each activity may relate to one indicator, to multiple indicators, or to the overall standards referenced.

1. **Creativity and Innovation**
2. **Communication and Collaboration**
3. **Research and Information Fluency**
4. **Critical Thinking, Problem Solving, and Decision Making**
5. **Digital Citizenship**
6. **Technology Operations and Concepts**

Grades PK–2 (Ages 4–8)

The following experiences with technology and digital resources are examples of learning activities students might engage in during PK–2 (ages 4–8):

1. Illustrate and communicate original ideas and stories using digital tools and media-rich resources. (1,2)
2. Identify, research, and collect data on an environmental issue using digital resources and propose a developmentally appropriate solution. (1,3,4)
3. Engage in learning activities with learners from multiple cultures through email and other electronic means. (2,6)
4. In a collaborative work group, use a variety of technologies to produce a digital presentation or product in a curriculum area. (1,2,6)
5. Find and evaluate information related to a current or historical person or event using digital resources. (3)
6. Use simulations and graphical organizers to explore and depict patterns of growth, such as the life cycles of plants and animals. (1,3,4)
7. Demonstrate safe and cooperative use of technology. (5)
8. Independently apply digital tools and resources to address a variety of tasks and problems. (4,6)
9. Communicate about technology using developmentally appropriate and accurate terminology. (6)
10. Demonstrate the ability to navigate in virtual environments such as electronic books, simulation software, and websites. (6)

Grades 3–5 (Ages 8–11)

The following experiences with technology and digital resources are examples of learning activities students might engage in during grades 3–5 (ages 8–11):

1. Produce a media-rich digital story about a significant local event based on first-person interviews. (1,2,3,4)
2. Use digital imaging technology to modify or create works of art for use in a digital presentation. (1,2,6)

3. Recognize bias in digital resources while researching an environmental issue with guidance from the teacher. (3,4)
4. Select and apply digital tools to collect, organize, and analyze data to evaluate theories or test hypotheses. (3,4,6)
5. Identify and investigate a global issue and generate possible solutions using digital tools and resources (3,4)
6. Conduct science experiments using digital instruments and measurement devices. (4,6)
7. Conceptualize, guide, and manage individual or group learning projects using digital planning tools with teacher support. (4,6)
8. Practice injury prevention by applying a variety of ergonomic strategies when using technology. (5)
9. Debate the effect of existing and emerging technologies on individuals, society, and the global community. (5,6)
10. Apply previous knowledge of digital technology operations to analyze and solve current hardware and software problems. (4,6)

Grades 6–8 (Ages 11–14)

The following experiences with technology and digital resources are examples of learning activities students might engage in during grades 6–8 (ages 11–14):

1. Describe and illustrate a content-related concept or process using a model, simulation, or concept-mapping software. (1,2)
2. Create original animations or videos documenting school, community, or local events. (1,2,6)
3. Gather data, examine patterns, and apply information for decision making using digital tools and resources. (1,4)
4. Participate in a cooperative learning project in an online learning community. (2)
5. Evaluate digital resources to determine the credibility of the author and publisher and the timeliness and accuracy of the content. (3)
6. Employ data-collection technology, such as probes, handheld devices, and geographic mapping systems, to gather, view, analyze, and report results for content-related problems. (3,4,6)
7. Select and use the appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. (3,4,6)
8. Use collaborative electronic authoring tools to explore common curriculum content from multicultural perspectives with other learners. (2,3,4,5)
9. Integrate a variety of file types to create and illustrate a document or presentation. (1,6)
10. Independently develop and apply strategies for identifying and solving routine hardware and software problems. (4,6)

Grades 9–12 (Ages 14–18)

The following experiences with technology and digital resources are examples of learning activities students might engage in during grades 9–12 (ages 14–18):

1. Design, develop, and test a digital learning game to demonstrate knowledge and skills related to curriculum content. (1,4)
2. Create and publish an online art gallery with examples and commentary that demonstrate an understanding of different historical periods, cultures, and countries. (1,2)
3. Select digital tools or resources to use for a real-world task and justify the selection based on their efficiency and effectiveness. (3,6)
4. Employ curriculum-specific simulations to practice critical-thinking processes. (1,4)
5. Identify a complex global issue, develop a systematic plan of investigation, and present innovative sustainable solutions. (1,2,3,4)
6. Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs. (4,5,6)

7. Design a website that meets accessibility requirements. (1,5)
8. Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources. (3,5)
9. Create media-rich presentations for other students on the appropriate and ethical use of digital tools and resources. (1,5)
10. Configure and troubleshoot hardware, software, and network systems to optimize their use for learning and productivity. (4,6)

Data Collection Instruments

Surveys

Online surveys are best viewed as online forms. This preserves the ability to see pull down menu options, etc. All of the surveys utilized for Sample District's evaluation can be viewed at the following address:

www.sun-associates.com/Sample District/surveys

Principal Questions

Preamble:

- Remind the principal that this interview, and visit, is data gathering for the evaluation portion of Sun Associates' work with the district.
- We are conducting this evaluation of how teaching technology supports teaching and learning in Sample District schools so as to assemble baseline/background information that will help drive the creation of a strategic technology plan for the district.
- (if it comes up) The strategic technology plan will most likely be a part of the broader strategic plan that the district is creating this school year.
- All individual level information – such as this conversation - that we collect for the evaluation is confidential and will only be reported in aggregate as a way of describing district performance against a set of indicators developed by district stakeholders (mostly C.O. staff).
- Our intent for this visit is to do a basic walk-through. We do not need to be (or want to be) accompanied and do not need to see any special technology activities. We are happy to be pointed toward specific teachers or places in the building, but will really be trying to get a sense of a "typical day" here in the school.
- Any questions? If not, then…

1. As a way of getting started, could you give me an example of student experiences/activities that you've found among teachers in your school that you feel help students develop the 4C's? This doesn't have to relate to technology at all. (listen for, and prompt if necessary, how *typical* this is…we want a sense of frequency?)

2. How do you envision that technology could support similar learning outcomes?

3. What other visions do you have for how technology could support learning in your school?

4. What barriers exist within this school (and elsewhere I suppose) to realizing this environment/vision? (probe for PD, resources, policies, skills/knowledge, etc.)

5. To what extent to you feel that teachers here have the skills (technology and otherwise) to create types of learning environments feel need to be created?

6. What sorts of policies and practices have you – and/or the district – put into place to support the integration of technology?

7. Anything else you want to tell us about your work, resources, or other factors impacting the use of technology in teaching and learning?

Teacher Focus Group Questions

Preamble:

This focus group is part of Sample District's evaluation of how instructional technology is used to support teaching and learning across the district. Sun Associates has been tasked with conducting this evaluation. In addition to this focus group, we have conducted an online survey and will be visiting all schools and classrooms in the district. We are also interviewing principals. Ultimately, this evaluation will be reported to the district in the next several months and will form the basis for a new strategic technology plan to be developed later in the year.

Your responses to these questions will be confidential. Details of today's conversation will not be reported to the district. So feel free to be frank and to speak your mind here. Further, it is not necessary for each person to answer each question. Rather, the questions are conversation starters. Respond as you wish, and I will prompt the group to provide more detail and/or to move on as necessary. We will complete this activity within an hour as promised.

Any questions? OK, let's go!

1. What experiences in your classroom do you feel help students develop the 4C's? (listen for, and prompt if necessary, how *typical* this is...frequency?)

2. In what ways would you ideally use technology to support similar learning outcomes?

3. What other ideas do you have for how technology could support learning?

4. What barriers exist to being able to realize this vision/ideal? (probe for PD, resources, policies, skills/knowledge, etc.)

5. What kinds of skills do you feel that you need with regard to teaching and learning with technology and how could Sample District best help/support you in developing these?

6. To what extent do you feel that your <u>students</u> have the skills (attitudes, dispositions, ???) necessary for using technology in a meaningful way in the classroom?

7. Anything else you want to tell us about your work, resources, or other factors impacting the use of technology in teaching and learning?

Parent Focus Group Questions

Preamble:

This focus group is part of Sample District's evaluation of how instructional technology is used to support teaching and learning across the district. Sun Associates has been tasked with conducting this evaluation. In addition to this parent focus group, we have conducted online surveys of parents, teachers, and community members (and some students) and will be visiting all schools and classrooms in the district. We are also interviewing principals and other administrators. Ultimately, this evaluation will be reported to the district within the next several months and will form the basis for a new strategic technology plan to be developed later in the year.

Your responses to these questions will be confidential. Details of today's conversation will not be reported to the district. So feel free to be frank and to speak your mind here. Further, it is not necessary for each person to answer each question. Rather, the questions are conversation starters. Respond as you wish, and I will prompt the group to provide more detail and/or to move on as necessary. We will complete this activity within an hour as promised.

1. As a way of getting started, could you give me an example of something that you can recall your student doing over the past school year that you feel did an exemplary job of integrating technology

2. What is the value that the use of technology brought to the learning involved in that activity

3. Are there other ways that you can envision technology supporting your students' learning?

4. What barriers are you aware of that might exist to realizing this vision? (probe for teacher skills, resources, etc.)

5. To what extent to you feel that teachers here have the skills (technology and otherwise) to create types of learning environments feel need to be created?

6. Thinking about your child's experience in Sample District schools, do you feel that his/her exposure to technology-supported learning has been more or less consistent throughout the years? Why or why not?

(High School Only) To what extent do you feel that your student has been prepared to use technology in the ways that will be required when he/she enters college/real life?

7. Anything else you want to tell us about your work, resources, or other factors impacting the use of technology in teaching and learning?

Curriculum Consultant Focus Group Questions

Preamble:

This focus group is part of Sample District's evaluation of how instructional technology is used to support teaching and learning across the district. Sun Associates has been tasked with conducting this evaluation. In addition to this focus group, we have conducted an online survey and will be visiting all schools and classrooms in the district. We are also interviewing principals. Ultimately, this evaluation will be reported to the district in the next several months and will form the basis for a new strategic technology plan to be developed later in the year.

Your responses to these questions will be confidential. Details of today's conversation will not be reported to the district. So feel free to be frank and to speak your mind here. Further, it is not necessary for each person to answer each question. Rather, the questions are conversation starters. Respond as you wish, and I will prompt the group to provide more detail and/or to move on as necessary. We will complete this activity within an hour as promised.

Any questions? OK, let's go!

1. First off, can you describe for me what you – in this role group – do? What's a "curriculum consultant"?

2. What classroom experiences do you feel do the best job of helping students develop the 4C's? These do not have to necessarily be technology-enriched experiences.

3. In what ways would you ideally use technology to support similar learning outcomes?

4. What other ideas do you have for how technology could support learning?

5. What in your opinion is the role of technology in FIPP and the Common Core?

6. How might you integrate technology into your professional development work surrounding FIPP and Common Core (or the work of the curriculum consultant in general)

7. Anything else you want to tell us about your work, resources, or other factors impacting the use of technology in teaching and learning?

School Board Focus Group Questions

Preamble:

- We're glad to have the opportunity to hear from the board about the same issues that we're talking to (going to be talking to) teachers, principals, and parents about.
- This focus group, and indeed our visit to the district this week and later in October, is about data gathering for the evaluation portion of Sun Associates' work with the district.
- As you know, we're in the district this week (and again in early October) to visit schools, and to interview principals, teachers, and parents. We're also running teacher, student, parent and community surveys.
- We are conducting this evaluation of <u>how teaching technology supports teaching and learning in Sample District schools</u> so as to assemble baseline/background information that will help inform the creation of a strategic technology plan for the district. The strategic technology plan will most likely be a part of the broader strategic plan that the district is creating this school year.
- <u>We are not actually writing the plan right now</u>, and in fact what we learn from the evaluation will be what informs the planning work. But right now, it's just evaluation.

The conversation this afternoon is going to focus on our asking you some questions designed to collect your opinion about what you envision around several of the key goals for how technology supports teaching and learning AND how you see the district and its community best supporting those aspects.

In order to organize our information, we're focusing our questions on 5 particular areas which we'll take up in a particular order. And if that all sounds ok to you, then may we proceed? (hand them a copy of the indicators)

OK, as you can see in the handout you've just been given, there are 5 focus areas in this evaluation. (name them). As you know, we met with a district-wide evaluation committee (containing central office staff, such as the superintendent, those who oversee curriculum, community relations, technology, etc.) a couple of weeks ago to develop some basic indicators for what the district would like to have in place to drive and support the integration of instructional technology. As you can see, these all flow from the top level indicator that relates to what students should know and be able to do in terms of their learning.

So first, we'd like to draw your attention to the STUDENT SKILLS/OUTCOMES indicator.

1. Read the STUDENT SKILLS/OUTCOMES prompt, give them a second to read the indicator, and then ask for their impressions, reactions.
2. Next TEACHER SKILLS/PEDAGOGY
3. Next ADMINISTRATORS and POLICY
4. NEXT INFRASTRUCTURE
5. Finally COMMUNITY.
6. Anything else?

Sample District Schools
Instructional Technology Evaluation

Sun Associates, 2012

Classroom Observation Protocol

Lakota Observations

Observation Date

Observer

Grade/Classroom

Teacher

School

Girls

Boys

▢ Science ▢ ELA ▢ Math ▢ Social Studies ▢ PE/Health ▢ SPED Class

▢ Art/Music ▢ Technology ▢ Foreign Language ▢ General Elementary ▢ Other

Observation Notes

▢ Students Using Tech ▢ Student Centered Learning ▢ Students Using CBI ▢ Teacher Lecture

What is the teacher doing/what's happening in this class?

Teacher Discussion

Technology in Room

▢ IWB ▢ Teacher Workstation ▢ Student Laptops ▢ Student Desktops ▢ Printer

▢ Document Camera ▢ Projector (not part of IWB) ▢ iPad/Smartphone (note which, below)

Other tech present

Additional Comments

Additional Comments