Hastings-on-Hudson Union Free School District

Technology Evaluation Report

December, 2007

Sun Associates

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Executive Summary

Between October and November, 2007 Sun Associates – an educational technology consulting firm based in North Chelmsford, MA – conducted an evaluation study of instructional technology and its impact on teachers and students in the Hastings-on-Hudson Union Free School District (HUFSD). This evaluation was rooted in a set of highly descriptive indicator statements which visualized how technology could ideally benefit the teaching and learning environment in the district. Drafted by a committee of district stakeholders, these indicators provided the basis for data collection questions that Sun Associates employed to develop the findings presented in this report.

Based upon our observation, interview, and survey data of teachers and administrators across the district we have formulated the following key findings:

- Teachers in HUFSD are generally quite comfortable using the technology tools to which they have access. Teachers across the district utilize technology for communication, preparation of materials, and presentation of lessons. There are also good levels of use of the district's student record-keeping systems.

- Teachers are somewhat dissatisfied with their levels of access to technology resources, technology support, and technology professional development. The evaluators also find that the availability of support and professional development are insufficient.

- Students throughout the district make use of a range of technologies. Nevertheless, student technology use is inconsistent from class to class and is highly dependent on teacher skill and interest. Teachers are generally not aware of standards/expectations for student technology skills. There is no uniform understanding among teachers of how best to integrate technology into core curriculum.

- Much of the technology use in classrooms is teacher-directed and supports teacher-centered approaches to pedagogy. Student use of technology tends to focus on watching presentations (e.g,. resources projected on Smartboards) or creating materials (e.g, word processing). There are some examples of technology used to support hands-on investigation (e.g., probe ware in secondary science classes), but these are relatively rare.

- Despite low levels of technology integration, the evaluators observed some teachers employing pedagogical approaches that would be ideal for the integration of technology. It appears that a lack of professional development and a lack of plausible models for effectively integrating technology have stood in the way of these teachers making more of the tools that they - and their students - have available.

These findings have lead to a series of related recommendations:

- The district should develop a leadership capacity around instructional technology. At its most basic level, this means that the district should create the official position of District Technology Coordinator (DTC) and provide this position with tools and structures for necessary to be a district-level leader.

- The district - as lead by the DTC - should create a strategic technology plan that focuses on achieving the teaching and learning outcomes identified in the teacher and student indicators. This plan should lay out the strategies for attaining these learning goals, and should only discuss infrastructure as a way of supporting these goals.

- The district should continue to develop the teacher and student indicators into benchmarked performance rubrics that relate to the goals in a new strategic technology plan. These indicators should become the basis for a formative evaluation effort that will build upon the baseline data presented in this current evaluation report.

- The district should establish the position of Instructional Technology Specialist (ITS) at the elementary and secondary (Middle School) level. The individuals in these positions should be charged with working with classroom teachers to integrate technology as a tool for learning. The ITS would therefore be the point-people for a significant new professional development initiative in the district.

- The district should continue to develop its technical infrastructure, but only as driven by the continued development and refinement of teaching and learning goals. For this reason, particular attention should be paid to those technologies that put tools for investigation and construction of knowledge directly in the hands of students. Wireless technologies warrant specific attention.

Findings and recommendations – as well as the connections between the two – are discussed in further detail in the following chapters.

Process and Methodology

The following report presents data and findings related to how Hastings-on-Hudson Union Free School District (HUFSD) teachers use instructional and information technology as a tool for personal/professional productivity as well as an aid to students in their construction of knowledge. Taken together, these two areas - teacher and student use - provide a composite picture of how technology is currently implemented in Hastings as a tool for teaching and learning.

The data detailed in this report was gathered during the month of October, 2007 by a variety of means. Early in the month, an online survey was conducted, with a total response of 121 teachers. Following the survey were three teacher focus groups (elementary, middle and high school with a total n=23); 18 hours of classroom/building observations; and over 30 short (average 15 minute) interviews of teachers and aides; and much longer interviews with building administrators, the district technology coordinator, and the district curriculum director. When compared and analyzed, these data sources were found to present a high degree of consistency; survey data was validated by the further detail acquired through focus groups, observations, and interviews. Data from focus groups and interviews supports and provides greater insight into the findings resulting from the online survey. In most cases, data from the elementary school was remarkably consistent to that gathered from the middle and high school (usually considered together as "secondary" in this report). Where significant differences exist, these have been noted in the report text.

In the following report, the data presented in graphs and as percentages in the text is drawn from the online survey. Evaluators' observation data is used to bolster and contextualize this survey data. The quotes (shown in shaded text boxes) were offered in focus groups, individual interviews, and free-text survey comments. Quotes are presented verbatim (except where edited for clarity, as noted).

The data collection instruments - survey, focus group questions, interview protocol, etc. - used by the evaluators are all rooted in "indicator statements" developed by the committee of district teachers, administrators, and staff overseeing this technology evaluation effort. This committee met on October 2, 2007 to develop these indicators and again on November 29 to review the assembled data. The following report represents the evaluators' findings and recommendations based upon the data collected and flowing from the meeting with the committee on November 29, 2007.

Findings

Teachers

In October, 2007, the district technology evaluation committee drafted the following basic indicator statement related to teacher technology use and access:

Technology tools and resources exist to make teachers more efficient and more productive. Teachers find that their use of technology is an efficient and effective use of their time.

Teachers have a firm grasp of grade-level specific scope and sequence of student technology skills and technology outcomes. They are aware of, implement, and share with their colleagues a variety of best and effective practices for embedding technology into their instructional practice. Teachers facilitate student learning by designing the appropriate instructional environments where curriculum and technology learning can effectively transpire.

Teachers use a variety of data and information to support and inform their instructional decisions. There is consistent and ready access to the information/data resources necessary to support management and instructional decisions. Teachers are comfortable with the use of tech to organize their work, share and acquire information, and communicate within and outside of the district. Teachers are skilled in guiding appropriate student use of technology as a tool within content-specific learning. Guidelines/standards exist for how technology best fits within the curriculum and teachers are well versed in these standards and supported in their application. Teachers have knowledge of, access to, and the skills to use specific tools and resources that facilitate content-area learning.

Teachers are well-supported in their access to and use of professional development in the use of technologies for teaching and learning and management. Teachers demonstrate their understanding of technology's place in instruction through the appropriate implementation of new classroom practices incorporating technology tools and resources.

Sun Associates took this indicator and proceeded to develop a set of data collection questions which would seek out the degree to which HUFSD teachers work fit the indicator. These tools are provided in the Appendix of this report. The resulting survey, focus group, interview and observation data generated evaluation findings which cluster around issues related to Teacher Productivity and issues related to Teacher Satisfaction with various aspects of the district's technology environment. These findings are presented below.
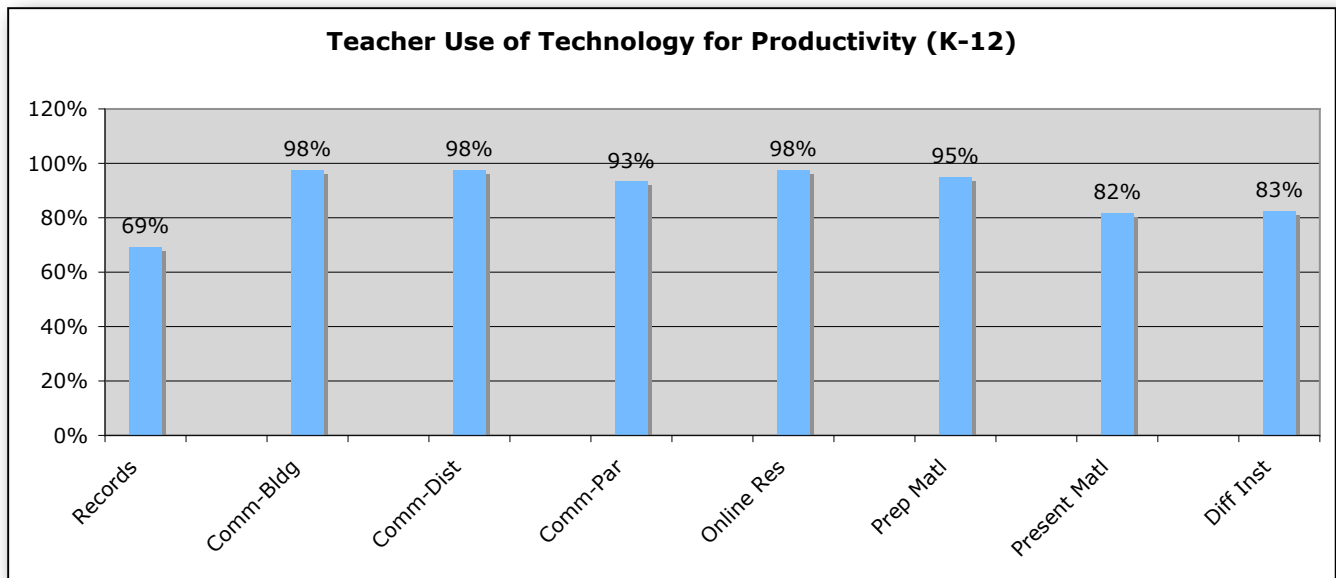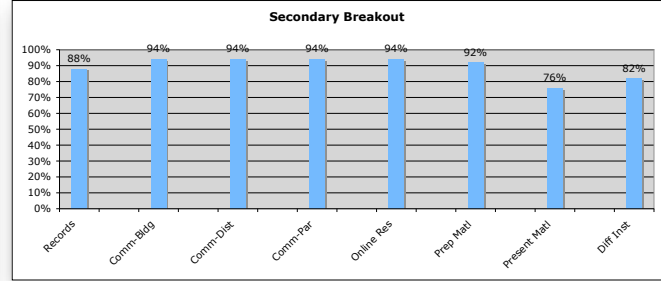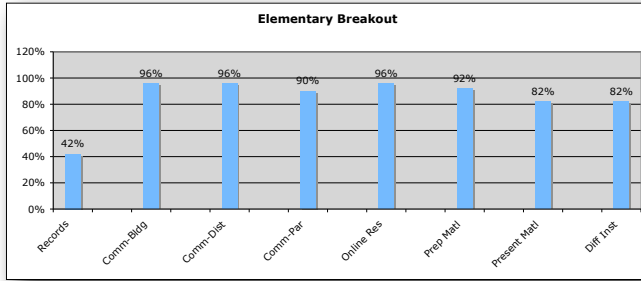
Teacher Productivity

Technology Use and Access

Throughout the district, teachers at all levels were found to be making use of technology for the purposes of personal and professional productivity. Many feel that their access to web resources, email and presentation devices have benefited their teaching and lesson preparation in notable ways. Generally, productivity uses of technology were consistent across the district, with minor exceptions related to grade level.

HUFSD teachers generally report being comfortable using technology for their own personal productivity, specifically for accessing resources, communicating with parents and colleagues, and presenting/storing lessons. Among the small percentage of teachers not using technology for these tasks, reasons commonly cited include inadequate access to functional equipment and a preference for performing certain administrative duties by hand, particularly at the elementary level.

As the following graphs show, teachers across the district report that they are using technology to support a variety of personal technology tasks. Well over 90% (close to 100%) of teachers K-12 reported using technology for most of the tasks identified on the evaluator's online survey. Only record-keeping, presentation of materials, and differentiating instruction received less than 90% ratings. While some differences can be seen between elementary and secondary (middle and high school), these trends hold true across levels.

Teacher Use of Technology for Productivity (K-12)

Category	Percentage
Records	69%
Comm-Bldg	98%
Comm-Dist	98%
Comm-Par	93%
Online Res	98%
Prep Matl	95%
Present Matl	82%
Diff Inst	83%

Record-keeping

A majority of teachers (69%) district-wide report using technology for student record keeping, including grading, attendance, and test score analysis. The data shows that this is a more frequent occurrence at the secondary level, a finding which may simply reflect the greater need for grading in middle and high school classes (42% Elementary, 88% Secondary).

Communication

Technology is found to play a strong role in communication in Hastings, with 96% of teachers overall using email and eBoards within the building or system, and 93% using technology to connect with parents and students themselves

> *I'm in communication with grades k – 6. The email situation is great. I DO communicate with parents via email…[I] have an eboard.*
>
> *"My students use eboards… to receive homework assignments, and all students email me their homework.*

Preparation of Materials and Lessons

Across the district 95% of teachers use technology to prepare materials (handouts, tests, etc) for use in the classroom, and 82% use it in the presentation of lessons/content. Most commonly, teachers cite finding Internet resources to incorporate into their classroom lessons.

> *"I can deliver lessons, directions etc. electronically. If I use hardcopy, there are many problems that have to be dealt with, but if students have access to a shared drive, my files and can find my lessons, that's much more effective. If students have own computer, they can even access this material from home"*
>
> *"I had a smart board last year not this year. It enhanced my instruction enormously. Pulling down maps, doing graphic organizers, pulling things around on the smart board. Enhanced every aspect. I also use tech to educate myself on subject matter".*

Differentiating Instruction and Data-based Decision Making

Among those classroom teachers participating in the data collection activities, 83% report using technology to differentiate instruction. Despite this high self-reported percentage, the evaluators find through observations and interview/focus group discussions that little differentiation is actually occurring. Rather, what seems to be happening is that some teachers are using technology to make their instruction "different", but they are not integrating technology for the purpose of individualizing instruction for different learners' needs (which is what "differentiating" instruction actually means). The evaluators find that if teachers had more professional development that featured training on how to integrate technology as a pedagogical tool integrated with learning objectives - versus simply as a presentation tool - teachers would realize that their current use of technology to differentiate instruction is actually rather low.

Likewise, it is quite unclear as to the degree to which teachers use student data to impact decision making and tailor instruction as is described in the Teacher Indicator. While teachers did mention the use of online student data systems, there was little discussion of what teachers would do with any of the data warehoused in these systems. The district clearly uses this data for state reporting (and other local reports), but the evaluators did not receive any significant indication from teachers that they had any role in the use of this data other than to input it.

Teacher Satisfaction

Access

Overall, a majority of teachers district-wide feel that they have somewhat satisfactory access to the technology they need to support teaching and productivity tasks. There was considerable discussion around the unavailability of particular resources such as Smartboards, but despite this, over 80% of teachers (as seen in the following graphs) are at least somewhat satisfied with their access to technology. The evaluators interpret this as "somewhat satisfied, but somewhat unsatisfied with…"; and in most cases, that lack of satisfaction was related to the absent Smartboard.

Among the 13% of teachers who "rarely" feel satisfied with the available technology, there is concern over equipment condition and distribution. Schedules for labs and laptop carts are reported to be difficult and confusing to work with, and the technology available in classrooms feels insufficient to a number of teachers. Teachers note that problems with the scheduling system serve to discourage them from signing up for resources like labs and laptop carts. At Hillside, the lab is sometimes scheduled by individual teachers for standard blocks of time for an entire year, and that serves to "block time" that is sometimes not used. At the Farragut Complex, some teachers note that the laptop cart scheduling system leads to confusion and disappointment when teachers put in requests and sometimes hear nothing about the status of their request until *after* their desired date. In this case, the problem seems to be the lack of an adequate feedback loop between the scheduling system and the teachers making requests. Regardless, the end result is that teachers say that they are reluctant to plan on using resources that they cannot be sure of accessing in a satisfactory manner.

"The technology I have in my classroom is limited. Therefore, students can not carry out preview activities because our classroom does not have a projector screen, a smart board, or enough computers that work on a consistent basis."

"Last year there were never any computer labs available during the blocks when I had classes, nor were there enough computers in any of the computer lab for my larger classes of 27 students.

I must go to another classroom or computer lab to use such technology as a smartboard due to the fact that there is not one in my classroom. Technology is also limited due to the lack of technology (we only have an overhead in our room which we must use with the shades down due to a lack of a projector screen) and the fact that our computers do not work consistently.
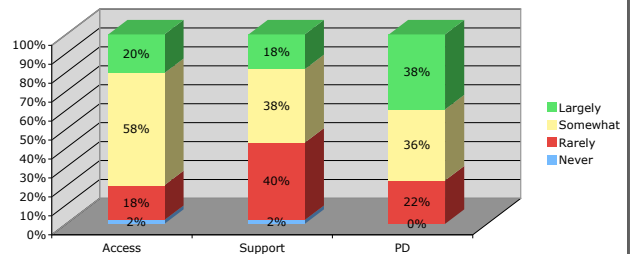
Teacher Satisfaction (K-12)
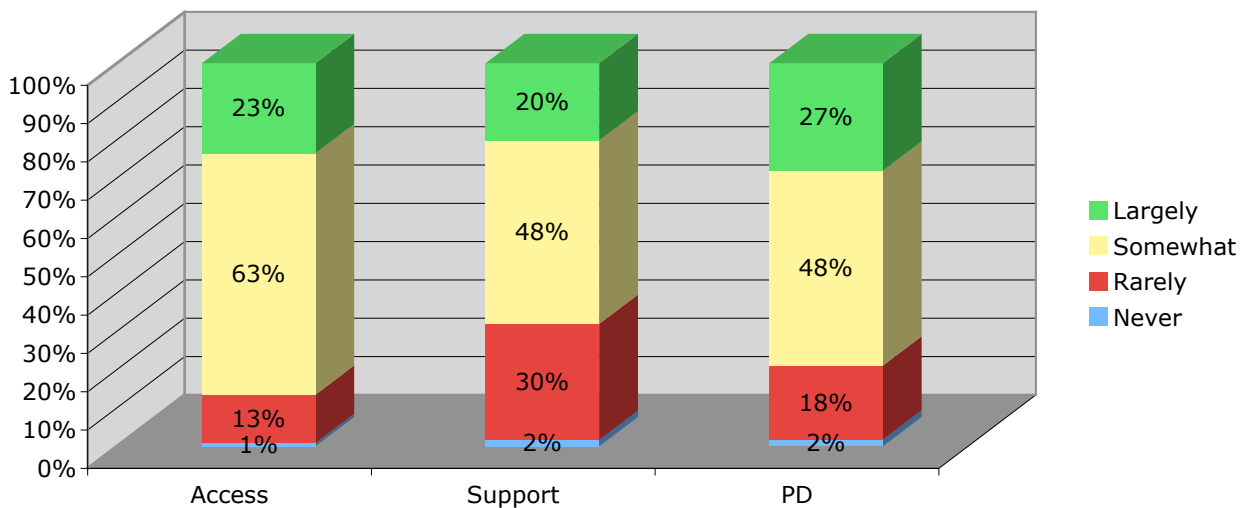
Teacher Satisfaction (Elementary)
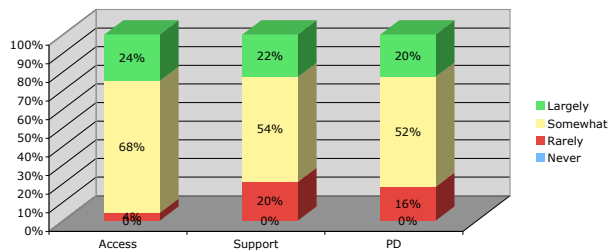
Teacher Satisfaction (Secondary)

Teachers at Farragut pointed to a number of laptop-specific problems relating to insufficiently charged batteries and some problems with loaded software.

> *"I use different rooms, the technology available is not consistent throughout the classrooms (and from year to year) and I cannot get computer time. The laptops are rarely stored properly, so when you can get them, they do not work."*
>
> *"The laptops this year do not work well and students always have an issue signing on/saving work/ printing".*

Issues related to saving files may also be the result of network issues. The network in the Hastings schools is described in teachers' comments as unreliable, and there is a feeling among some that network usage policies prevent teachers from being able to be as efficient and productive as they otherwise might be:

> *"Some decisions made outside of our areas have an impact on our productivity, for example, we want to use our own laptops in our classes and project our work to the class, but there are rules that prevent us from doing that, and we can't be fully productive*
>
> *"I can't get on the school's system from home so I can't get on and grade at home. So if they have work stored locally, I can't see it from home".*
>
> *"Broaden the program recognition from what we currently use to read other programs. The Novell system limits our ability".*
>
> *"It isn't the job of teachers to help the technology work better – should have specialists whose job is to make it work. Besides, the danger is that the network is delicate and someone messing with it can really screw it up".*

Again, it is important to note that many of the details related to teacher frustration over "access" (and as will be discussed below, support and professional development) emerge only when examining teacher focus group, interview, and observation data. The survey data does not provide this level of specific detail.

Support

Support for technology is also an area of frustration for many Hastings teachers. 30% of teachers report "rarely" feeling satisfied in this regard. As mentioned above, concerns about network robustness, equipment condition, and the responsiveness of network administration, are prevalent across the district.

> *"We…need a better way to communicate our needs, to get responses from the and the Director in a timely fashion"*
>
> *"We need a real Help Desk with someone who answers the phone to our needs. "What we have now is severely limited by paranoia that the network will be destroyed—I should be able to attach my computer to the network, and need more exposure to educational software that is out there"*

Additionally, there is a strong feeling among teachers that they could be using technology more extensively if the district were to provide the personnel to support them in learning new ways to incorporate technology. Several expressed a desire both for assistance selecting software to support the curriculum, and for training to make more effective use of the technology they already have:

> *"We need better academic support for teachers—a middleman who understands technology and education so he can put software on the network and show teachers how to use it"*
>
> *"I am uncertain of the possibilities & options available for the integration of technology in the ELA classroom. Meeting with a specialist to explore theses ideas would be helpful…"*

Professional Development

Although teachers do not necessarily "connect the dots", the issue support is in fact closely related to that of professional development. In most school districts, support staff - and particularly, instructional technology support staff - actually are the key providers of teacher professional development. As noted above, in Hastings what little support there is turns out to be contract staff and mostly focused on "technical" support. There really is no instructional support, and related to this is the fact that there is also virtually no professional development around technology integration.

Not surprisingly, only 27% of teachers district wide report being "largely satisfied" with current offerings related to technology. Satisfaction is notably higher among secondary teachers than elementary (20% elementary, 38% secondary). Another 48% district-wide (52% elementary, 36% secondary) report being "somewhat satisfied" with the professional development opportunities available to them. When asked to discuss ways in which the district could better support them in their technology efforts, many teachers identified training needs:

> *"I would like training. I'm not as knowledgeable as others. I want really good, worthwhile, effective, training in how to use GroupWise, everything. The training we got was not effective."*
>
> *"As a staff, we're all in so many different places as far as what we know and can do. Individually, we feel limited."*
>
> *"…there is not much training available. We can volunteer to go at the end of the day to some training, but there is none during the school day."*

Students

The indicator statement developed by the district for technology's impact on student learning reads as follows:

Students across all grade levels are comfortable and skilled in the flexible use of technology as a resource for the acquisition and construction of knowledge. Students access and appropriately use technology tools and resources within learner-centered classrooms for the development of conceptual understanding, analytical skills, critical thinking, and higher order thinking skills. Students use technology for self-regulation and the gathering of information necessary to their progress as learners. Students are adept at making appropriate choices as to the use of technologies to apply to their own learning needs and tasks. Students recognize the connection between acquiring technology skills, knowledge, and dispositions and the benefit that this will bring to them as lifelong learners.

Student technology learning is embedded in content area learning and takes advantage of resources readily available in the district's learning environment. Students are able to transfer basic learning skills to technology-enriched learning activities. Technology becomes a resource that is scaffolded into the construction of a broad base of content-specific knowledge.

Students understand and practice the expectations for the ethical, legal and appropriate use of technology tools and technology-mediated information. Students have learned how to use technology for effective communication. Students understand technology-mediated information within the proper context and are media-literate.

As was done with the Teacher indicator discussed in the previous sections of this chapter, Sun Associates took the Student indicator and proceeded to develop a set of data collection questions which would seek out the degree to which Hastings students' experience work fit that described in the indictor. These tools are provided in the Appendix of this report. The resulting survey, focus group, interview and observation data generated evaluation findings which cluster around issues related to Technology to Support Learning and issues related to Student Technology Skills. These findings are presented below.

Technology to Support Learning

The evaluators find that across the district, teachers state that students use technology in a variety of ways to support content-area learning. Much of this student use – particularly at the elementary level – is in a passive mode with students interacting with content and resources displayed by their teachers in a full class or large group setting. Elementary teachers are enthusiastic about their use of Smartboards and various software to engage students in these presentations. At the secondary level (middle and high school), many of these same modes carry forward, with the addition of more 1:1 student use of technology such as laptops, calculators, and science probes.

Frequency of Student Use (K-12)

Frequencies of Student Use (Elementary)

Frequency of Student Use (Secondary)
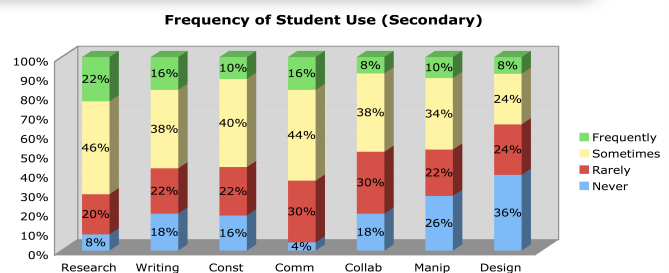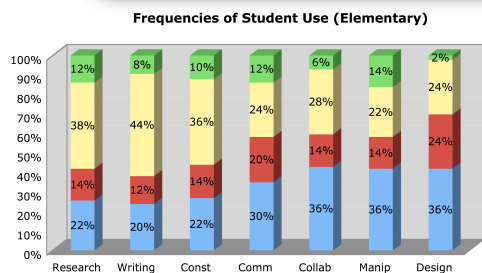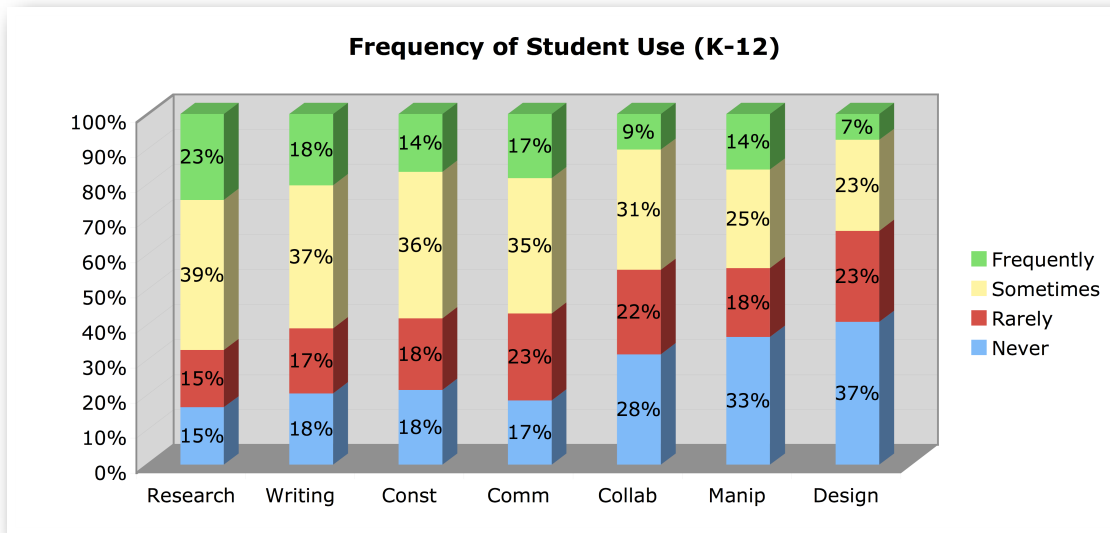
Across all levels, teachers reflect on the value that technology tools bring to student learning and understanding. In particular, some teachers feel that technology benefits students by exposing them to a greater variety of resources and enabling the manipulation of information in new and unique ways. Nevertheless, when directly questioned about the specific impacts that technology has on their students' ability to develop various higher order thinking skills and dispositions, many teachers defaulted to a position that stated that student benefits were linked to technology access and that insufficient access stymied greater impact.

Acquiring Knowledge

Across grade levels, more than half of all teachers report that students use technology as a tool for acquiring knowledge. Overall, 23% of teachers report that their students "frequently" use technology for research, while 39% report "sometimes" and another 30% report "rarely or never". Examples throughout the data suggest that research takes place both in labs and in classrooms, both individually and as a whole-class exercise. In several cases, teachers specifically cite research and access to web resources as one of the greatest benefits of technology access:

> *"I can expose students to the places and cultures we study, so that they can do research. Additionally, using the visual aspect of technology provides additional reinforcement and aids the learning process."*
>
> *"The old model to illustrate types of styles was to put posters on the walls in my room; now with access to Internet the class can look at more vivid images along with biographical info, and easily switch from style to style, or delve more into historic development – access to the Internet and the ability to project the images in the classroom has raised the quality level of the models we use in art."*
>
> *"I use [the Internet] continuously. Revolutionized my teaching in terms of fast access to information. Fast and broad and easy to present to kids."*

As was discussed above in the section on Teacher Access, a large number of teachers expressed interest in doing more of this type of work with their students, but feel limited by the availability of equipment.

Construction of Knowledge

Only 14% of all teachers surveyed report that technology is used frequently in the construction of knowledge. Again, a greater number (36%) describe students as "sometimes" using technology in the construction of knowledge. Those reporting rare or nonexistent use make up 36% overall.

> *"Student work is limited when we do research, because they don't always have computers available – and they do better research when they use computers"*

Observations and conversations with teachers across the district suggest that in several subject areas at the high school in particular, students are able to interact with content and develop an understanding of concepts more effectively as a result of the technology in their hands:

> *"We have probes to assist with graphing – I feel that my students get a better conceptual understanding as the graph is formed by the computer as the activity progresses – computers give wonderful models in science – molecular etc. models in action help them learn science concepts more fully." (Math)*
>
> *"Using the computer with my classes I think they demonstrate better conceptualization of ideas – their subjects are not so isolated if I can make a spontaneous connections in classroom with the computer." (Social Studies)*
>
> *"Creative writing really works well on the computer; the students create something and then edit it often. They are less inclined to do so if they handwrite their work." (ELA)*

Collaboration

Teachers reporting that their students frequently use technology in a collaborative manner numbered less than one tenth overall. Across the district, 31% of teachers report that students only "sometimes" collaborate through the use of technology, and another 28% believe this "never" happens. Among the 9% district wide reporting "frequent" use, it was not clear whether "collaboration" was interpreted to describe the sharing of resources, or a more meaningful connection around ideas. In fact, few comments exist in the focus group/survey data to support the latter interpretation.

Communication of Ideas

Only 17% of participating teachers report that students "frequently" make use of technology to communicate their ideas. Just over one third (35%) of participating teachers estimate that this happens "sometimes", while another 23% describe it as "rare", and 17% "never".

Among the 17% reporting that this happens frequently, Powerpoint and composition (writing) were among the most commonly mentioned applications used to present or communicate ideas:

> *"During our study of the desert, my students create PowerPoint presentations based on their research and then uploaded to my e-board for parents to view".*
>
> *"my students use Microsoft Word to work through the writing process"*
>
> *"in the lab, students might be composing and revising essays".*

Curricular Concepts

The bulk of the data from Hastings teachers suggests that technology use is most often tied to content area learning, and is not addressed as a separate subject. With the exception of *Type to Learn,* all of the software, applications, and Internet resources mentioned by teachers are used to support and enhance the teaching of regular subject area content. Additionally, many teachers use (and want to use) technology in the classroom in order to project web resources and explore sites directly related to the topic of study. That said, teachers are largely on their own to find resources related to the curriculum units they teach; there is no process by which sites or software is identified for teachers or technology is mapped to the curriculum.

> *"I try to use tech. to teach some more complicated concepts where graphical applications are needed."*
>
> *"...the children work on content related websites to review and enhance instruction. They also do research on websites for various social studies units. During our study of the desert, my students create PowerPoint presentations based on their research and then uploaded to my e-board for parents to view."*

Higher Order Thinking Skills

According to the teachers surveyed, using technology in the development of higher order thinking skills (including manipulation an analysis of data, presentation, and design) is something that happens infrequently in Hastings. Only one fourth of all participating teachers report that students "sometimes" use technology to manipulate and analyze data. Another 18% report that this happens "rarely", while a full 33% report that it "never" happens.

It is interesting to note here, that although several elementary classrooms were observed to be engaged in project-based learning (without technology), few elementary teachers actually spoke of using technology in ways that support this method of learning which is often associated with higher order thinking. More common in the data are teachers' descriptions of ways technology is used to *present* lessons and provide entire classes with information:

> *"In the classroom, we use the Smartboard and overhead to display classroom lessons across the content areas."*
>
> *"I use the computer regularly for PowerPoints etc, and projector to make it visible to the whole class."*
>
> *"I use the SmartBoard and a projector to make websites accessible to my students."*

Other teachers described and were observed using technology (frequently Smartboards) within a traditional instructional setting, to demonstrate techniques, provide examples and play video/audio clips for the class. Overall, one tenth of all HUFSD teachers questioned consider higher order thinking among the common outcomes of their exposure to technology. Although few in number, there are teachers in the system who use technology in ways that help support inquiry, exploration and analysis. This type of activity was observed at the middle school.

Student Technology Skills

Standards

Data gathered from teachers about student technology skills reveals a lack of consistency or common understanding regarding grade level expectations. While more than half of the teachers polled are aware of the existence of national, state, or local, standards for student technology use, and a majority feel at least somewhat responsible for teaching these skills, there is no consistently recognized process for making this happen. *Type to Learn* is employed in rotations through computer labs, but with little structure, accountability, or consistency.

When asked specifically to comment on the extent to which state, local and national technology standards influence student technology use or instruction in HUFSD, elementary teachers offered the following:

> *"This has never come into play."*
>
> *"I don't think as a school or district we've looked at these"*
>
> *"..the computer lab is an extension of the classroom…there shouldn't be any standards for technology specifically. They just need to know how to type, but that's the only tech specific thing I can think of."*

Ethics

Overall the issue of ethical uses of technology seems not to be a big one among teachers in HUFSD. At the secondary level there is recognition among several teachers of the importance of teaching certain basic ethical lessons related to Internet research, but the point was also made that in order to teacher certain ethical lessons effectively, teachers need unrestricted access to the web:

> *"The district should not put a blanket block on outside content—don't make a whole realm of technology unavailable to them…we need to tech ethics of technology and can't do that without access—the district decided what is blocked—and it often severely limits what we can do."*

Overall though, few participants had much, if anything to say about ethical uses of technology. It appears, in fact, that in a great number of cases, students' exposure to Internet content is mediated by the teacher, either projected on the Smartboard or collected and presented to the class through other means. This model is particularly prevalent in the lower grades.

Recommendations

Flowing from the findings presented in the previous chapter, the evaluators have developed a set of recommendations for HUFSD that connect to three broad themes – Leadership for Technology, Staffing for Technology, and Technology Infrastructure. We believe – based on our analysis of the baseline data we collected and our discussion of that data with the district technology evaluation committee – that work within each of these categories would begin to move HUFSD ahead toward achieving its three technology indicators.

Leadership

It has become a maxim in the instructional technology field that strong leadership is necessary to engage teachers with the sorts of changes in practice necessary to integrate technology in a truly meaningful way. This is clearly what is called for in moving HUFSD toward realizing the vision implied by its student, teacher, and administrator indicators.

As detailed in our findings, we do not believe that HUFSD is significantly lacking in the technology resources necessary to realize its vision. Rather, it is our contention that some teachers are utilizing these resources in ways that meet with the indicators, and that many more would if leadership were to encourage and establish the conditions necessary to effect these uses.

We recommend that HUFSD create and empower leadership for technology via the following ways:

Establish the Position of District Technology Coordinator

It is our understanding that the position of District Technology Coordinator (DTC) is not currently an official district-level administrative position. If this is a technicality that needs to be addressed, then we recommend that this happen; but more to the point, we recommend that the District Technology Coordinator be able to meet with all district and building administrators on common ground and in a peer relationship.

The point of this elevation would be to enable the DTC to be present when decisions are made regarding curriculum, district policy, and other issues around which "leadership" is evident. The DTC should be able to provide input into these decisions and to advocate for the creation of policy that benefits from the integration of technology in teaching and learning. Likewise, the DTC should be in a position to work to implement this policy by directing staff and working with fellow administrators. Ultimately, the DTC would work with other district administrators to help build the understanding among all administrators that technology is more than infrastructure and is rather a tool and catalyst for teaching and learning within the district. This shift in perspective – away from considering technology essentially a "utility" - will take some time to effect, but this shift will only occur when the discussion of technology's role can occur at the district leader level where other discussions and decisions related to *curriculum* are held. Until then, technology – and all that relates to it - is likely to be considered more of a support system than something truly integrated into the central mission of the district.

In many of the districts in which Sun Associates works – in NY as well as other states – the DTC is indeed a full administrative position.[1] Therefore, we do not believe that such a change in HUFSD would be out of line with what is increasingly standard and accepted practice in other school districts.

Consider the District Technology Plan to be a Truly Strategic, Policy, Document

The current district technology plan is centered around a goal connected to the district's Strategic Plan. Its mission statement aligns well with the indicators developed recently for instructional technology, yet the plan itself seems to focus largely on infrastructure and the request that teachers "meet standards" for technology. While both infrastructure issues and standards achievement are worthy of inclusion in a set of goals for technology, the plan seems to be missing the actions or strategies for achieving these goals. To effectively lead, a technology plan must put forth a strong and coherent vision, present goals linked to that vision, and outline policies to support all steps toward that vision. HUFSD would benefit greatly from a truly strategic technology plan that could be put into the hands of a district-level leader capable of making it happen. In this way, the technology plan becomes the policy document from which the DTC works.

Implement Evaluation as an Integral Part of the Strategic Technology Planning Process

HUFSD has taken a very positive first step in this regard by creating basic indicators for student, teacher, and administrator technology use. Rich in descriptive detail, these indicators currently serve as vision statements for the direction that the district wishes to pursue. We recommend that the district continue to work with these indicators – and the baseline data collected in our assessment – to craft benchmarked indicators of performance related to each of these areas. Benchmarks should be connected to strategic technology planning goals in such a way that the performance and progress toward these goals can be measured by the indicators. Evaluation of progress using these benchmarked indicators should occur annually as part of the planning process. This can, and should, transpire as a district-facilitated (operated) process and should not necessarily require the ongoing involvement of outside consultants or evaluators.

Annual instructional technology evaluation can serve as progress report around which district leaders (fronted by the DTC) and the entire district community reflects upon progress made toward achieving the goals of the plan. Carried out this way, reflection would be tied to a shared understanding of how technology fits into HUFSD's overall vision for teaching and learning.

Staffing

In a district the size of HUFSD, one would expect considerable "hands on" involvement of all administrators in the actual work of implementing their areas of authority. It is clear, however, that there is much more work in the area of technology integration than can be performed by a single person (i.e., the District Technology Coordinator). At present, we find that HUFSD has some significant deficits in its technology staffing, and therefore we recommend that steps be taken to address these issues.

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[1] A sample job description for at DTC is attached in the Appendix

Create and Fill the Position of Instructional Technology Specialist (ITS)

We recommend that the district hire one ITS for the elementary school and another to work at the middle school level. These positions would exist essentially as teachers who work to model technology integration for their fellow teachers, and to provide immediate ("just in time") professional development.[2] It is essential that the ITS not be tied to a particular lab or classroom, as his/her primary function will be to work with other teachers in a co-teaching/mentoring/modeling capacity. The ITS will function more as a trainer to teachers than as a routine teacher of students. The fact that the ITS is a teacher will provide the necessary understanding of pedagogy and content to create credible and effective instructional activities that teachers can integrate into their classrooms.

We recommend that there be one ITS at Hillside and another at Farragut Middle School so that the individuals in these positions can focus time and attention on these two distinct teacher/student populations. One person traveling between the buildings would, in our opinion, be a less effective situation in terms of time available to work with teachers and would create stress on the individual placed into the position.

Once filled, the ITS positions would serve as front line technology leaders for their buildings. They would provide a locus for the most effective type of professional development available – that is, the kind of training that comes into a teacher's classroom when s/he needs it and models the strategies necessary for effective technology integration.

Provide Increased Professional Development Opportunities to Teachers at all Levels

Teachers across the district have asked for additional professional development, and we concur that this would be beneficial. While teachers mostly asked for more training on "how-to" aspects of technology operation, we believe that ultimately the greatest amount of professional development should be focused on issues of how to use technology to support new ways of learning. In this regard, we see professional development primarily as a *staffing* issue. As noted above, the type of professional development most in need by HUFSD teachers is that which can be best provided by an Instructional Technology Specialist working in a 1:1 or small group setting with teachers. Modeling, coaching, and mentoring should figure as the main models for the professional development we recommend. While some of the professional development content would indeed relate to "how to" use various technologies (e.g., multimedia tools, online resources, SmartBoards, etc.), it is critical that this training be contextualized within a discussion of how to integrate these tools *for the purposes* of inspiring and supporting the types of project-based, constructivist, learning described in the student indicator.

This type of technology professional development – that focused on pedagogy and technology integration – is challenging to create and must be focused on particular grades and content areas. Generalized training offered to entire buildings and multi-subject area groups often resorts to being more about the tools than the pedagogy. When this happens, the emphasis on student learning outcomes is lost, and the professional development becomes more traditional "how to" technology skills training. In our opinion, the best way to keep the professional development appropriately focused is to insure that the trainers are actual teachers who are working with small, focused, groups of their peers. In short, the ITS should be the main trainer.

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[2] A sample job description for an Instructional Technology Specialist is attached in the Appendix.

Infrastructure

As we note in the Findings section, we are of the overall impression that HUFSD is reasonably well-equipped in terms of classroom technology. Nevertheless, we do recommend that the district continue to address on-going infrastructure needs and that there are certain new purchases that should be made.

Purchase Technologies that Serve Student-Centered Uses

As noted in the findings, many of the current uses of technology in HUFSD schools – particularly at the elementary level – are those that are teacher-centered. Technologies such as SmartBoards are popular among teachers, and are clearly "engaging" for students, but these are still technologies that are primarily in the hands of teachers. We recommend expanding the infrastructure to incorporate more student-centered technologies. In particular, we recommend developing a wireless computing infrastructure at Hillside and expanding the use of wireless in the Farragut Complex.

We recommend implementing wireless in such a way that it supports the type of collaborative, small group, project-centered learning envisioned in the student indicator. This means that we do not necessarily encourage the district to pursue a 1:1 laptop environment as much as an environment where networked computing resources can be accessed "anytime/anywhere" in the district.[3] Such an environment depends on a ubiquitous wireless network infrastructure and a sufficient number of portable computers so that they can be deployed flexibly for students and teachers to access the network when and where needed. Practically, this might take the form of a wireless cart (with perhaps 20 computers) that is shared among classrooms on a common floor or grade-level (as at Hillside). Teachers could schedule an entire cart when 1:1 computing is necessary, but more often there might only be 4 or 5 computers in use in a classroom at a single time, thereby enabling the cart to serve perhaps 4 classrooms simultaneously. In most circumstances, this would be a sufficient number of computers to serve project-based learning needs.

The key here is that infrastructure purchases – in this case, wireless computing – follow the *vision* established in the district's indicators. Infrastructure purchases should be tied closely to the learning needs that they support *and* the training necessary to insure their use to support effective and desirable teaching and learning. In this way, our infrastructure recommendations fit within those for leadership (particularly strategic planning and policy development) and staffing (in that new staffing brings professional development).

Continue to Build and Improve the Existing Infrastructure

There are several aspects of the existing technology infrastructure that seem to demand continued attention, most notably the network infrastructure and SmartBoards.

While we believe that the basic network infrastructure serves most existing needs, we did find that many teachers consider the network to be "temperamental". There are also concerns that the basic network architecture (servers, operating system, etc.) is not set up in a way that is most advantageous to teacher use. There are issues related to integrating various hardware platforms (e.g., Macs) into the common network infrastructure. Features such as "remote access" to network resources from outside the LAN do not seem to

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[3] While a true 1:1 environment would not be a bad thing, and there are increasing numbers of studies that show educational benefit when this sort of environment is created, we suggest that HUFSD ease their way into this. Laptop carts in the elementary school would be a step in this direction.

work reliably and there is broad agreement that these systems could be improved. We concur with this opinion and recommend that the district continue to work with technical consultants to improve the performance and integration of the network infrastructure.

In our findings, we note considerable teacher interest in acquiring more SmartBoards. While we do not believe that all of the current SmartBoards are being used to their potential, we find that this is mostly an issue of professional development and instructional leadership. There is nothing inherently wrong with a SmartBoard if it is integrated in ways that emphasize a student-centered approach to learning rather than one which is teacher-directed and oriented mostly toward presentation. Therefore as a technology tool, it has a use and could be a worthwhile addition to most well-equipped classrooms. Since many teachers seem to feel that a SmartBoard is a necessary tool for effective technology integration, we believe that if possible the district should proceed to outfit as many classrooms as possible with SmartBoards. Doing this will validate teachers' desires for hardware equity and will allow some teachers to "move on" toward exploring the many ways that technology can integrate with instruction.

Improve the Reliability of Support and Maintenance Systems

One finding related to support and maintenance is that some teachers feel that support and maintenance requests are made, but then "vanish" into a system which has little, or incomplete, feedback. One aspect of this finding is that the current "help desk" is actually just an email drop box. Teachers who send mail to the help desk are sometimes left in the dark as to the status of their requests until they are addressed, or not. Staffing the help desk with a live individual would help alleviate this problem tremendously. Policies should be developed where help/support requests are acknowledged and specific expectations for when the request will be fulfilled are established.

Improving these systems would have the greatest benefit in terms of improving teacher confidence in technology and thereby lowering the perceived risk in using technology as a tool for teaching and learning.

Appendix

Teacher Focus Group Questions

We are interested in your opinion of how technology—as it is currently used in your grade/classroom -- impacts student learning. In what ways, if any, does technology *change* the way that students learn and/or develop. (We're not talking about the development of tech skills as much as we are using tech to develop new ways of thinking. Probe for construction of knowledge, analytical skills, critical thinking, HOTS, etc.)

2. How does technology impact or change your work as a teacher? In particular, we're looking for ways that technology helps you do the work that you need to do. (probe for productivity, increased collaboration, individualizing instruction etc.)

3. To what extent do state, local, and national technology standards influence your students' use of technology?

4. What do you believe it means for students to use technology in an ethical manner, and how is this addressed in HUFSD? (be prepared to cut them off on this … as this is one that people can just start complaining about)

5. What would you like to do with technology that you're currently not able to do? (probe for why people want to be able to do what they list---try to get to the bottom of the Smartboard fascination..)

6. How could the district better enable you, as a teacher, to do what you'd like with technology?
   (if necessary prompt for training, tech support, access, etc)

7. Is there anything else you'd like us to know?

Administrator Interview Questions

1. Describe the typical setting or classroom environment in which **students in this school** use technology. (Prompt for not only location, but for the "climate"--what it looks like-- in the lab/classroom)

2. Please describe how technology use supports content-area (curriculum-based) learning in general in this school?

3. How do you know that technology is being used in ways that support and improve student learning?

4. Thinking beyond specific curriculum areas, how does technology impact student learning in your school? (Prompt for thinking skills, independent/self regulated learning)

5. In your opinion, how can administrators best support teachers' use of technology within the instructional environment?

6. If you could change one thing – as an administrator – that would improve technology's impact on teaching and learning in this building, what would it be?

7. As a final question, we'd like to see if we could get your "vision" for technology in your school. Could you complete the following sentence for us….*Ideally, "technology integration" in this school would look like:*

Observation Protocol

_____ Lab   _____ Classroom (note grade/subj) _____ Laptop Cart

If Classroom - Organization/Setting of the Classroom:
(Student groupings, number of workstations, etc.)
(Also note student work visible…what is it?)

Description of What the Lesson/Activity Is:
(content/curriculum and/or technology skills)

Using Technology in Ways that Demonstrate?

_____ Critical thinking skills

_____ Analytical skills

_____ Gathering information

_____ Student choice of technology tools/usage

Degree/Extent to Which the Activity Links to Technology Skills Standards:

Follow-up questions for teacher (if you observed a specific tech activity/lesson):

How does this connect to your curriculum?
How typical is this sort of activity?
If you could (or will) do it again, how might you improve it?
What happens in this school/district that supports or discourages more activities like this?

Online Survey

Hastings-on-Hudson UFSD
Teaching and Learning with Technology- Teacher Survey

Dear Hastings Teacher:

The following survey is part of the district's effort to assess how computer and information technology is *currently* used to support teaching and learning across the district. We realize that there are many different points of view and opinions related to how the district should implement its technology plan, and this survey is one way in which we will be gathering information on those varied opinions and experiences. In addition to this survey, we will also be visiting each school, observing teachers and students, and conducting teacher/administrator interviews.

In the following survey, we want to explore current practices with regard to various instructional technology tools and techniques. We also want to learn about how you currently perceive of the value of technology as a tool for improving student performance and achievement. Therefore, these questions ask about your beliefs and attitudes related to technology integration. Many of the questions are multiple choice, **but we also have provided a space at the end of the survey for you to enter as much text as you might wish**. Please feel free to use this text space to add any additional comments (positive or negative) you might wish.

We will analyze this survey's data in aggregate to determine an overall picture of uses and attitudes related to technology in Hastings-on-Hudson UFSD. We **will not** track the responses from individual respondents, and therefore all of your responses will be anonymous.

In each of the questions below that ask for an open-ended response, please feel free to type in as much text as you would like. The box will automatically scroll and your text will automatically wrap in the box.

Thank you in advance for your time!

Please select the role group that most closely matches your current position:

    Select a Role/Position   ⬍

What grade level or subject do you teach?   Select a Grade Level or Subject   ⬍

In each of the questions below that ask for an open-ended response, please feel free to type in as much text as you would like. The box will automatically scroll and your text will automatically wrap in the box.

Technology Integration

If you are a classroom teacher, please answer the following questions based on what happens in your classroom or when your students work in the lab. If you are a specialist with building-level responsibilities (e.g., art, guidance, social worker,) please respond based on your opinion for your building or setting.

1. Presently, using technology in my classroom/my school's lab means that... (complete the sentence/idea below):

2. Ideally, "technology integration" in my grade/subject area would look like:

[   ]

3. Overall, my students' use of technology [Please select ▲▼] meets this ideal for technology integration.

4. What would it take to make this a reality for your students (if it isn't already)?:

[   ]

5. I am familiar with standards (local benchmarks, NYS Technology Standards, ISTE standards) related to student use of technology in the grade(s) I teach: [Please select ▲▼]

6. Overall, I believe that my students are [Please select ▲▼] prepared to meet these standards.

7. I [Please select ▲▼] feel personally responsible for helping my students meet these standards

Teacher Use of Technology

I use technology to support the following teaching tasks (please check "Yes" or if No, then enter a reason in the text box associated with each item).

8.Student records (grades, attendance, test score analysis, etc.)	Yes ☐	No, because...
9. Communication within the building	Yes ☐	No, because...
10. Communication within the district	Yes ☐	No, because...
11. Communication with parents	Yes ☐	No, because...
12.Access to online resources	Yes ☐	No, because...
13. Preparation of student materials	Yes ☐	No, because...

(handouts, tests, etc.)	☐	
14. Presentation of material/content to students	Yes ☐	No, because...
15. Differentiating instruction	Yes ☐	No, because...
16. Other (please note here)		

17. I am [Please select ↕] satisfied with my access to technology to support these tasks

18. I am [Please select ↕] satisfied with the technical support I receive to conduct these tasks

19. I am [Please select ↕] satisfied with my knowledge/training to conduct these tasks

20. I would like to participate in the following kinds of professional development to support my knowledge/skill development (please specify topics, delivery methods, frequencies, settings, etc):

Student Use of Technology

In my classroom/lab, my students use technology in the following ways **in relation to their learning**:

21. Researching/accessing information	Please select a frequency ↕
22. Drafting, editing, supporting the writing process	Please select a frequency ↕
23. Developing/constructing understanding	Please select a frequency ↕
24. Communicating/presenting knowledge	Please select a frequency ↕
25. Collaborating	Please select a frequency ↕
26. Manipulating and analyzing data and information (math, science, etc.)	Please select a frequency ↕
27. Designing/programming/authoring with multimedia tools	Please select a frequency ↕

Additional Comments

Use this section to add clarification to any question, or to add any thoughts you might have on any aspect (positive or negative) of how instructional technology impacts your teaching and your students' learning. Once again, please be assured that your comments are confidential.

When you are finished with this survey, click on this button to (Submit) **the survey for processing. Please click only once.**

When your survey is accepted by the system, you will be taken to a confirmation page. This may take a moment, so please be patient.

If you want to delete all of your answers and start again, click here (Reset)

Survey Form Updated 10/12/07

Job Description - Director of Technology

(from the NC State Department of Education, offered as a sample of a "standard" DTC job description)

Title: **DIRECTOR OF TECHNOLOGY**
Location: System-Level
License: (077) Supervisor's License
Reports to: Superintendent or designee
Supervises: System-level technology staff, technicians, network engineers, and others as designated

NATURE OF WORK
The Director of Technology is primarily concerned with the development, implementation, operation, monitoring, and evaluation of the technology program for the school system. This individual provides leadership in identifying hardware and software purchases, ensuring that they are consistent with the school system instructional technology plan and state technology guidelines. The employee coordinates, and may deliver, staff development on technology competencies needed for teaching the North Carolina Computer/ Technology Skills Curriculum to students and for acquiring the required North Carolina Technology Competencies for Educators needed for licensure renewal. The employee works collaboratively with the other members of the school system central office staff and school building staff to use technology and include technology applications as an integral part of the total instructional program.

ILLUSTRATIVE EXAMPLES OF WORK

1. Provides leadership for short- and long-range planning for all technology initiatives: vision, goals, program objectives/strategies/activities, infrastructure, staffing, training, evaluation, budgeting, and collaboration with others. Assist the coordinators and facilitators with implementing the system and the building-level technology plans in accordance with the North Carolina Instructional Technology Plan, the North Carolina Technological Recommendations and Standards, and other state recommendations and guidelines.
2. Plans, develops, and implements staff development activities to meet established instructional technology integration needs, computer skills curriculum, and the North Carolina Educator Technology Competencies licensure renewal.
3. Works with other Directors to integrate technology in the ongoing instructional program for all curriculum areas by identifying strategies and materials, and by implementing activities for integration.
4. Is knowledgeable of the hardware configurations and computer-related items on state contract and of the other technology-related state contract products. Use the state and local technology plans to establish standards for the purchase of equipment, software, related media, and supplies for instructional technology integration and management activities according to the local purchasing guidelines.
5. Supervises the system-wide inventory of technology assets.
6. Assists technology users in resolving problems associated with ordering, service, and support.
7. Plans and coordinates the implementation of special activities to promote technology.
8. Serves as a clearinghouse of information on trends, research, applications, and effective practices related to the use of technology in the school program and school system.
9. Serves as a system contact for all technology-related communication.

KNOWLEDGE, SKILLS, AND ABILITIES

- General knowledge of computers and related technologies as they apply to pre K-12 education.
- General knowledge of resources that support the North Carolina Computer/Technology Skills Curriculum, the North Carolina Educator Technology Competencies, and instructional integration of technology.
- General knowledge of infrastructure requirements and components of local and wide area networks, Internet, intranets, and distributed learning.
- Ability to communicate effectively with all levels of school system staff.
- Ability to assist users and trainers with software and hardware direction, guidance, and vision-setting.
- Ability to establish evaluation strategies and implement formative and summative activities.
- Ability to train educators in the use of hardware and software to meet the NC Technology Competencies for Educators.
- Ability to lead technology planning efforts including activities to develop, implement, and evaluate both system and school technology plans.
- Ability to manage financial resources.

SUGGESTED TRAINING AND EXPERIENCE

Master's degree in related field with 077 licensure
 Teaching experience

Job Description - Technology Facilitator

(Instructional Technology Specialist)

In North Carolina, the school's technology facilitator is the key instructional technology specialist for the school.

CERTIFICATION: NC Teacher Licensure + 18079 Special Endorsement in Computer Education

TECHNOLOGY FACILITATOR JOB DESCRIPTION

REPORTS TO: Principal and Technology Supervisor

SUPERVISES:

PURPOSE: This individual provides training and support to the staff on technology integration, the North Carolina Computer/ Technology Skills Curriculum, the North Carolina Technology Competencies for Educators, and administrative applications. The employee assists with identifying, acquiring, and maintaining hardware, software, and network products. This individual also assists in the implementation of the system and building-level technology plans.

DUTIES AND RESPONSIBILITIES

1. MAJOR FUNCTION: Planning and Facilitating Teaching and Learning

- Collaborates with teachers and other instructional staff to develop curriculum materials and specific lesson plans that integrate technology
- Models the integration of technology in all curriculum areas
- Facilitates school participation in technology programs and activities
- Conducts staff development in the areas of technology integration, the North Carolina Computer/ Technology Skills Curriculum, and the North Carolina Technology Competencies for
- Educators
- Collaborates with the school library media coordinator to provide leadership in the school's use of instructional technology resources to enhance learning
- Follows a plan for professional development and actively seeks out opportunities to grow professionally

2. MAJOR FUNCTION: Planning and Facilitating Information Access and Delivery

- Implements best practices related to technology use in the school program based on research, pilot programs, and state/national standards
- Works with the principal and school leadership team to provide access to technology resources and services of the technology facilitator at point of need
- Works with teachers and technology staff in the selection of resources that are compatible with the school technology infrastructure
- Assists with planning the design of the technology infrastructure so that information resources are continually available to the school community

- Promotes family, business, and community partnerships that support the academic success, career readiness, and general well-being of all children
- Adheres to and communicates copyright as well as other laws and guidelines pertaining to the distribution and ethical use of all resources
- Assists in maintaining hardware, software, and network infrastructure
- Serves as the school contact for addressing hardware and software issues

3. MAJOR FUNCTION: Planning and Facilitating Program Administration

- Leads, in partnership with the School Library Media Coordinator, the Media and Technology Advisory Committee in effective decision making to promote the media and technology program.
- Provides leadership and collaborates with the Media and Technology Advisory Committee to develop, implement, and update a school instructional technology plan aligned with the system-level technology plan
- Collaborates with teachers, media and technology staff, and students to evaluate and select resources addressing curricular needs and learning goals
- Plays a leading role in the school's budgetary process to ensure funding for the instructional technology program to support school-wide goals
- Leads in the ongoing evaluation of the effectiveness of the instructional technology program
- Prepares and submits accurate reports as required
- Carries out non-instructional duties as assigned and/or as needed to ensure student safety