Instructional Technology Program Review

Garrison Union Free School District

March 2013

Sun Associates
55 Middlesex Street, Suite 216
North Chelmsford, MA 01863
www.sun-associates.com

Contents

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 stakeholders in the Garrison Union Free School District developed a response, articulated as a highly descriptive performance indicator, that centers on the effective use of technology to support the implementation of the so-called "4Cs", that is, communication, collaboration, critical thinking and creativity. The stakeholders made explicit connection between technology use and a highly student-centered learning environment which emphasizes inquiry, information literacy, and is connected to the Common Core of learning.

The stakeholders were clear as to the role expected of teachers in assisting students toward meeting student expectations. In this visionary indicator, teachers are intended to use technology to support inquiry and interdisciplinary, thematic, student-centered learning. The stakeholders expressed the desire that teachers would not "fear" technology but would see and exploit its benefit as a tool which enables the types of learning environments desired for Garrison students. Furthermore, a third indicator – one which is focused on the role of the district to support student and teacher outcomes – calls for a common culture that supports informal learning, conversations, and the development of teacher skills in technology and pedagogy. This is accomplished via teacher professional development that interweaves technology with broad initiatives such as the Common Core and inquiry-based learning, all supported by a commonly held vision for technology's role in teaching and learning. Finally, the district's infrastructure indicator calls for systems and resources to be available which support the district's vision for teaching and learning.

These four indicators –Student Skills/Outcomes, Teacher Skills/Pedagogy, the Role of the District, and Infrastructure – formed the conceptual framework around which Garrison's Instructional Technology Program was reviewed by Sun Associates in January, 2013. Sun Associates is a professional educational program evaluation firm that specializes in Instructional Technology program review and strategic planning. Sun Associates worked with Garrison administrators, community members, and staff to gather a wide range of survey, interview, focus group and classroom observation data from the Garrison School and its community. Included in this collection was data from teachers, administrators, and parents. With data in-hand, the evaluators (Sun Associates) analyzed the district's performance against its developed performance indicators. The findings and associated recommendations from that evaluative analysis are the basis of the following report.

Summary Findings

Overall, the evaluators find Garrison School to be a place where skilled, caring, and committed teachers and administrators work closely with relatively small groups of students. The small size of the district/school is largely a very positive thing. There is a very keen sense of community in Garrison and it seems that nearly every parent and teacher is involved in some meaningful way with the operation of the district and the sustenance of its educational mission. Further, the small size means that every teacher is in close contact with his/her peers, leading to a very supportive learning community. Communication and collaboration among staff and administrators is simply easier in Garrison than would be the case in a larger district. Nevertheless, one downside of the small size is that the school can

ill afford to have parents or teachers on "different pages" with regard to the vision about how the educational environment should be constructed. In such a small environment, even small numbers of people who do not to participate in certain practices can create significantly inequitable impacts on students both within the school and in comparison to their peers in other school districts.

The evaluators find that while the district's indicators for Student Skills/Outcomes related to technology are quite visionary and positive, in reality teachers do not particularly connect the use of technology to development of student thinking and learning skills. Rather, teachers seem to see – and implement – student technology use as a limited set of discrete skills related to the use of particular tools. This occurs within a largely teacher-directed instructional environment which is not conducive to the development of student skills in the use of technology to support communication, collaboration, or critical thinking. As a closely related matter, the evaluators find that district performance in its Teacher Skills/Pedagogy indictor is also not presently up to the levels of performance specified in the indicator. In addition to the limited use of technology to support project based learning, the evaluators find that most student technology use is not currently student-centered, and teachers generally do not have many ideas for how to better integrate technology into their classrooms beyond expanded use of basic tools.

The evaluators root the student and teacher findings in actions that fall within the bounds of the Role of the District indicator. Specifically, the evaluators find that Garrison teachers have very few professional development resources and do not benefit from a commonly held vision for technology's role in teaching and learning. While the evaluators are certain that every Garrison teacher is doing what she/he feels is best in terms of supporting student learning, it is quite the case that most teachers really do not know what it means to, or how to, utilize technology in ways aligned with the district indicators. A strong vision, and the professional development necessary to support that vision, would go a long way in a small, close, district community such as Garrison School. Furthermore, while the district is now subject to varied and often quite divergent parent opinions as to the value of technology, these opinions could be wrangled into a productive (versus divergent) energy *if* the district were to take charge of managing this vision-setting process. This work seems essential if Garrison is to move ahead with realizing the teaching and learning potential of instructional technology in the 21st century.

Finally, Infrastructure must support any vision, skills, and training that the district establishes. While Garrison's technology infrastructure is currently serviceable, it is in need of upgrade in the near future. Teachers and students need to know that they will have the workstation power and network bandwidth necessary to fully participate in a 21st century learning environment.

Summary Recommendations

The evaluators' findings give rise to several basic recommendations for how Garrison could improve its Instructional Technology program. These recommendations can, and should, all be part of the district's strategic technology planning effort.

First and foremost, the district needs to establish a commonly held vision for technology's role in supporting – as well as *transforming* - teaching and learning. This vision should focus on technology's role in helping Garrison's students meet the challenges of life ahead in terms of becoming creative, collaborative, and critical life-long learners. Since this vision for student outcomes should not be specific to "technology", it is necessary for the district to articulate the role of technology in meeting

what should be in fact commonly held vision for *learning*. The evaluators recommend that the Student Skills/Outcomes and Teacher Skills/Pedagogy indicators be used as the basis for a vision for instructional technology integration and therefore the cornerstone of the district's new Instructional Technology Strategic Plan.

Next, Garrison needs to establish the professional development practices necessary to help teachers and students meet the district's vision. This professional development should generate exemplars, curriculum maps, and a scope and sequence of student technology skills that align with standards such as NETS, the Common Core, and the framework for 21st century learning. In order to conduct such meaningful professional development, the district will need to make better use of its current technology specialist's energies by focusing that position on job-embedded instructional support rather than direct student instruction and technical support.

Finally, Garrison needs to improve its technology infrastructure over the near-term future. As an immediate to-do, the district should upgrade its incoming network bandwidth to industry standard levels. Subsequently, plans need to be made to upgrade teacher and student laptops, expand the network to accommodate a wider variety of devices (including tablets and student/teacher-owned devices), and to upgrade the wireless infrastructure to industry-standard commercial quality.

I. Introduction

This evaluation report is designed to serve several purposes for Garrison 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. 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 Garrison school. This discussion is a key part of generating the technology plan itself, and of framing the plan within the broader context 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 Garrison School's teachers and students use technology to support learning in line with a set of visionary performance indicators created by the district. These indicators exist in four basic domains – Student Skills/Outcomes, Teacher Skills/Pedagogy, the Role of the District, and Infrastructure. These domains frame the basic areas of investigation of Garrison's instructional technology evaluation. In order to determine the district's performance within each of these areas, the evaluators collected data 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.

Garrison's evaluation indicators were developed with a committee of district stakeholders (see list of committee members in **Figure One**) in October 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. The evaluators also conducted teacher, parent, and school board focus groups, and principal interviews in every building. The evaluators visited every classroom in the school. In addition to the in-person data collection, the evaluators also administered teacher, parent, and student online surveys. **Figure Two** shows the *n* values for data collected in all categories.

Gloria Colucci, Superintendent
Nancy Romano, Technology Specialist
Christine Foertsch, Board of Education (and parent)
Theresa Orlandi, Board of Education (and parent)
Stephanie Impellittiere, Principal
Charlotte Rowe, Board of Education (and parent)
Susan Huetter, School Business Administrator

Figure One – Program Review Committee members.

Teacher Surveys	Parent Surveys	Student Surveys	Class Observations[1]	Principal Interview	Teachers in FGs	Parents in FGs
24	40	72	8	1	9	3

Figure Two – Table of data collected.

Background to the Indicators

The ISTE NETS-S Standards

The current Garrison 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.

[1] The number stated in this column reflects those observations that were detailed reports generated by the evaluators sitting in particular classrooms. In fact, every classroom in each school was observed, but the evaluators did not record the observation if it was of a single activity with no interaction between students and teachers (e.g., silent reading, individual work on worksheets, testing, etc.).

The NETS-S standards are:[2]

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.

ISTE has also created a set of teacher technology standards – NETS-T – that exist in parallel to the student standards (NETS-S). While the main effort in Garrison'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.

[2] 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.

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 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 Garrison's technology program review, the NETS S standards constitute an ideal against which the data is compared. As such, this section of the program review 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[3]

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 (**Figure Three**), 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.

[3] 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 Three – 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 (**Figure Four**).[4] 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.

[4] 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 Four – 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.[5]

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 Garrison 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.

[5] Loucks-Horsley and Stiegelbauer, 1991

II. Findings

In this chapter, the evaluators analyze the data collected from Garrison's teachers, administrators, parents, students and community members (see **Figure Three**) compared against the district's indicators.

Student Skills and Outcomes

Garrison's performance indicator for student skills and outcomes states:

> *Garrison students are developing the skills and dispositions described by the ISTE NETS-S standards, in particular communication, collaboration, critical thinking, and creativity. In keeping with NETS, students at all levels utilize technology within and in support of an environment that is student-centered, project-based, emphasizes inquiry, and generative of the learning skills that frame the Common Core of Learning. Information literacy skills are taught across all grade levels.*

This indicator logically breaks down into two broad categories of analysis – skilled use of technology to support the development of student thinking skills, and the use of technology to reach standards-based learning goals.

As general context for the more detailed skills investigation which follows, the evaluators note that Garrison teachers, parents, and students were all asked (via online survey) to recollect something that they or their students had done with technology in the classroom that seemed to have a positive impact on learning. The results of these open-response questions are shown as word maps in **Figures Five through Seven**. As seen in these analytical images – larger fonts indicate a greater prevalence of the word in the text of the responses – the terms "project", "learning", and "research" all emerge as often-used terms. These terms are significant to the evaluators in that they tend to sum up the findings related to how Garrison's students utilize instructional technologies; that is, they use technology within the context of projects largely as tool for "research" and the "learning" of content material. It is worth noting though that in teacher comments (**Figure Five**), the terms "project" and "research" are used much less frequently than "tools", "basic" and "skills". This meshes with the evaluators' overall findings for how Garrison students use technology within their educational environment. What exactly this looks like in the context of teaching and learning in Garrison School is explored further in the sections below.

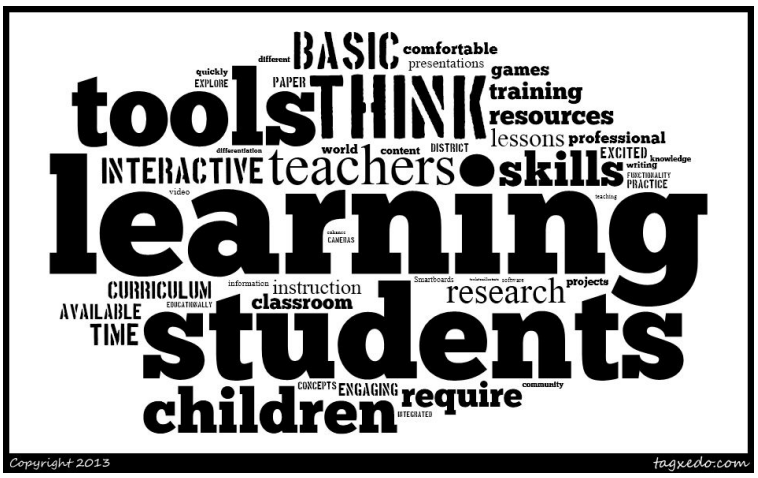


Figure Five – Word map of teacher response to survey Question 1

Figure Six– Word map of parent response to survey Question 1

Figure Seven – Word map of student response to survey Question 1.

Use of Technology to Support Development of Student Thinking Skills

Garrison's indicator for student skills calls for technology to be used in ways that are generative of skills commonly referred to as the "4Cs" – communication, collaboration, critical thinking, and creativity. Furthermore, there is the aim to develop these skills, and integrate technology, through a instructional environment that incorporates inquiry and project based learning. The evaluators find that while some teachers resonate with these aims, the majority of Garrison teachers utilize technology more as a basic tool for student productivity and to some degree research and information gathering. At present, technology is not widely used to as a catalyst for or essential ingredient in a project based learning environment.

As shown in Figure Eight, Garrison students report that they use technology to perform most of the key NETS-S standards one through four (see Appendix for the full test of NETS-S standards) no more than "several times a semester". The most frequently-cited use was for using technology "to do research", which maps to NETS-S standard three on "Research and Information Fluency".[6]

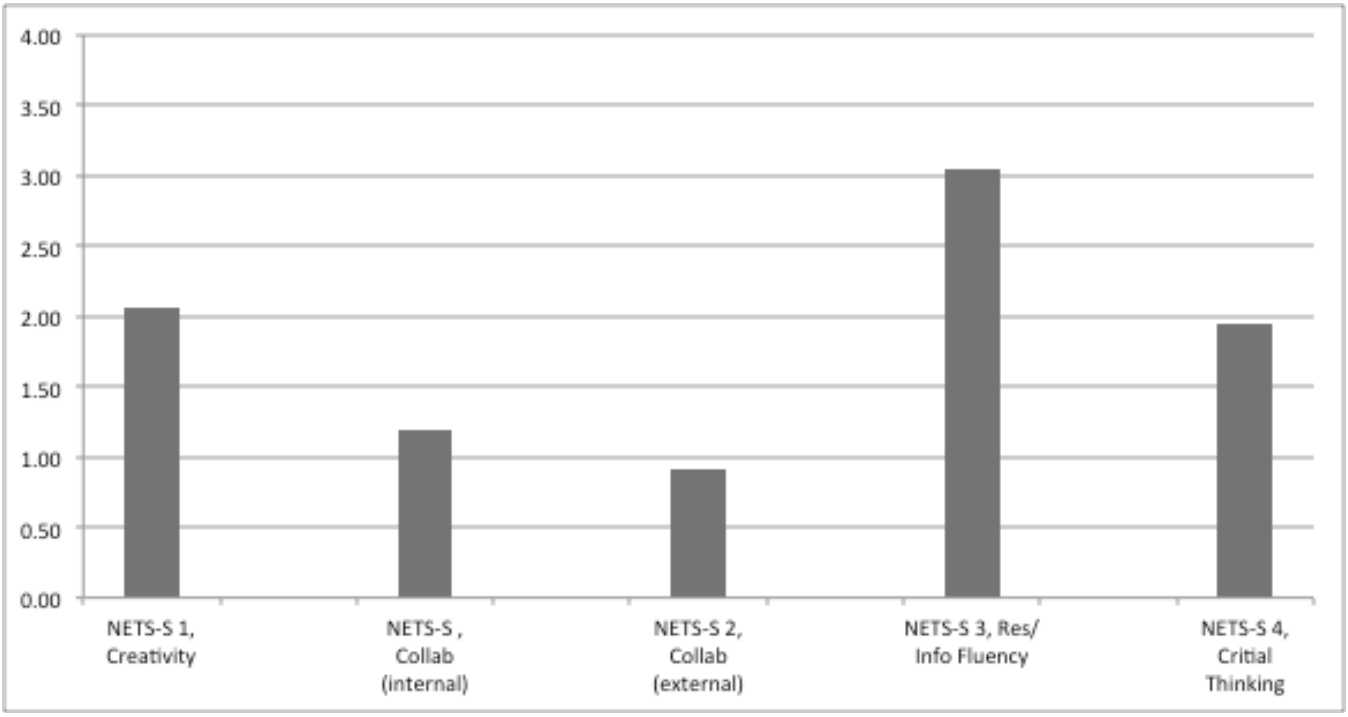


Figure Eight – Student responses to online survey question 2, about the frequency with which they use technology to perform various tasks. For analysis, these tasks are then mapped to NETS-S standards. Scale: 0 = Never, 1 = Several times a year, 2 = Several times a semester, 3 = Two or three times a month, 4 = At least once a week.

This student data is very consistent with teacher data coming from the same questions (see **Figure Nine**). The only difference is that teachers actually cite *lower* frequencies of student use of technology than do their students.

[6] Although cited as happening "two or three times a month", it is not at all clear that this research is in fact demonstrative of fluency or critical thinking in that it may be no more than Googling for information. This is an important point which will be addressed later in this chapter.

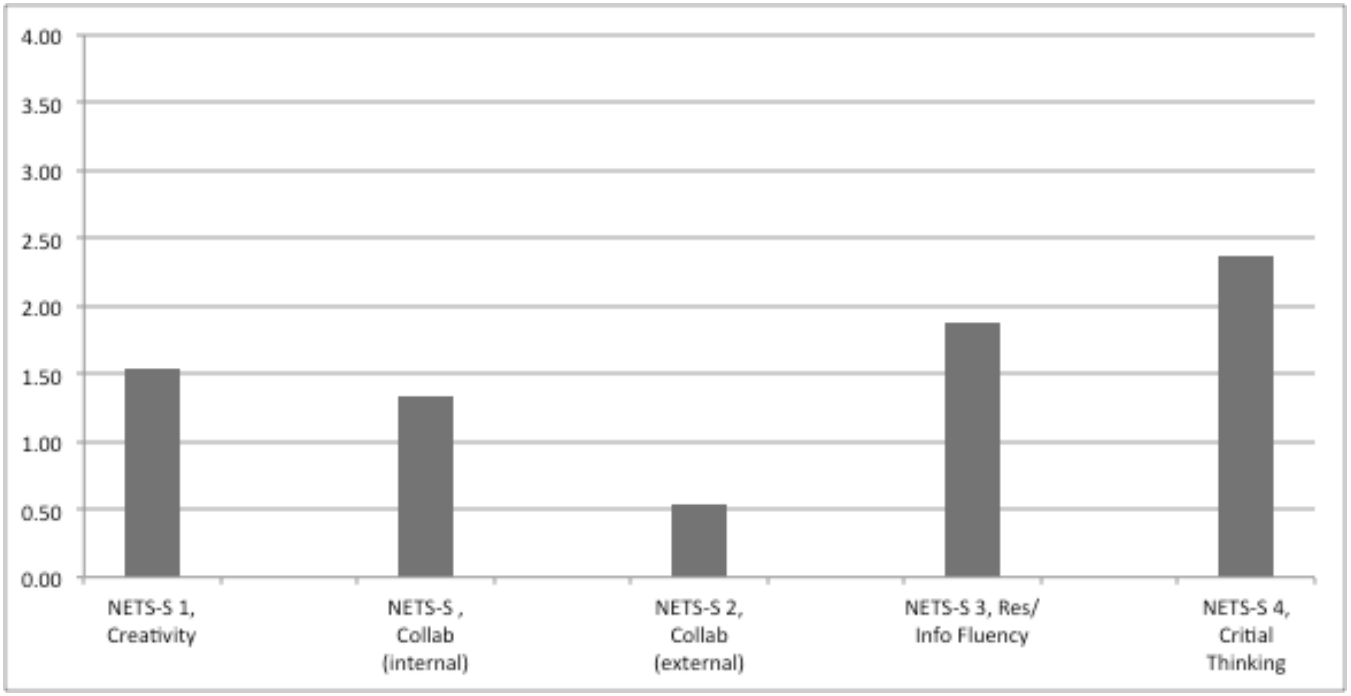


Figure Nine – Teacher responses to online survey question 2, about the frequency with which they use technology to perform and inspire various instructional (student) tasks. For analysis, these tasks are then mapped to NETS-S standards. Scale: 0 = Never, 1 = Several times a year, 2 = Several times a semester, 3 = Two or three times a month, 4 = At least once a week.

Teacher comments reinforce the finding that technology is primarily used by Garrison students as a *tool*. For example, when asked how technology might "ideally" be used to support learning, teacher comments tended to be either very broadly supportive of technology supporting the curriculum or very narrowly focused on the development of basic skills.

> *Technology is great because the children get answers to their questions quickly, and it is another means to excite students about their learning.*
>
> *I feel that technology is a tool that can be utilized by the children in their learning. I would like to see more opportunities for the children to go to the lab so all of them can use a computer at once. I think we could use the internet in better ways to help children do research. Also, the children need to strengthen their knowledge of typing, and productivity programs such as power point. These tools can be used to present projects after the children do their research.*
>
> *Technology can allow for different learning opportunities that are interactive and engaging. It provides an alternative to paper and pencil practice of skills.*
>
> *Technology should support the curriculum and bring in resources in a more interactive way. It should allow you to measure and record data more accurately. It should make learning more investing and engaging without slowing the learning process down.*

Figure Ten, below, shows teacher data in response to a series of survey questions probing for information on their students' skills in using technology in various ways to support their learning.

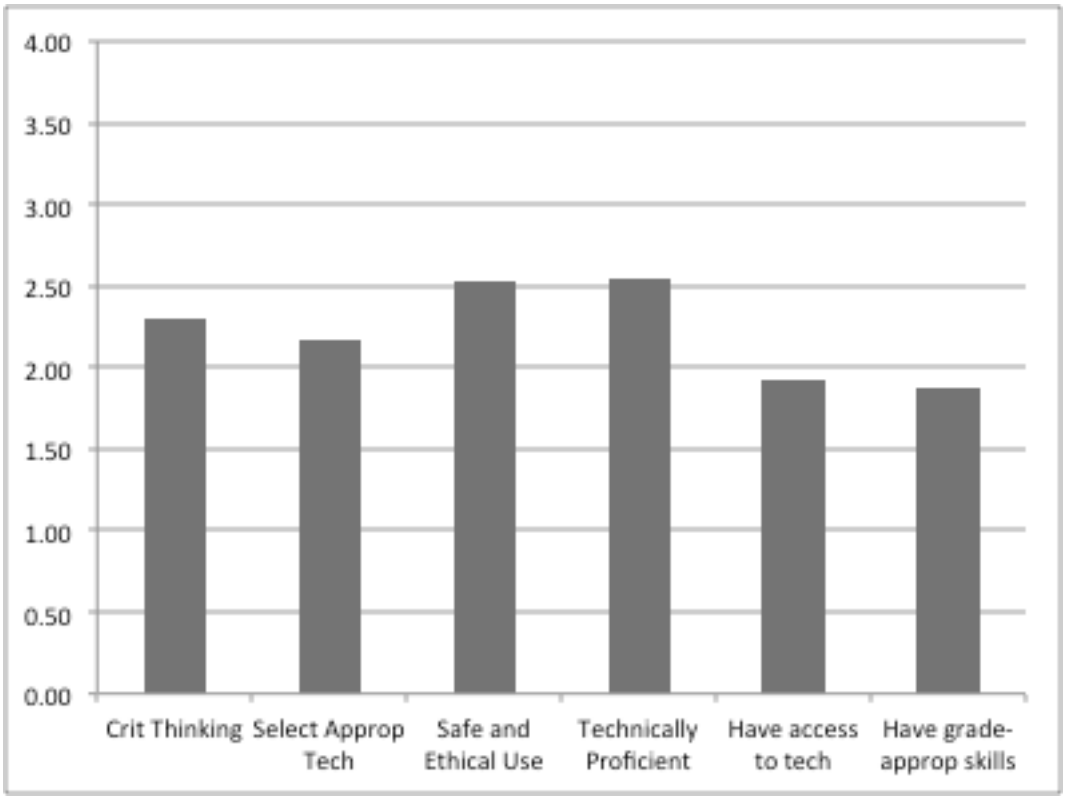


Figure Ten -- Teacher responses to survey question 4, probing for their degree of agreement with statements expressing that students have the skills to use technology in various ways. Scale: 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree.

As can be seen, teachers were mostly neutral in their assessment of student skills in using technology for essential learning activities such as demonstrating critical thinking, selecting appropriate technology tools, and using technology in a safe and ethical way. The evaluators caution that this data could be seen both as teacher uncertainty as to student skills as well as a lack of clarity as to what it means for students to use technology in the ways described by the survey questions. Either way, this data is not strongly supportive of students using technology in ways aligned with Garrison's indicators or of teachers having the pedagogical understanding what it means to use technology in these ways. This last point will be returned to in the next section of this report.

When asked for specific examples of how technology supports critical thinking and problem-solving, teachers came up with very few examples and those few examples that they did note tended still to focus on student use of tools.

> *[I] Use online subscription resources to explore concepts for class - United Streaming Video, Brainpop, Grolier Online Encyclopedias.*

The same phenomenon was observed when teachers were interviewed in-person as to how they had actually incorporated technology in student activities. Teachers noted using software tools that allowed

them to "show them what I am doing and they can follow along" or to "show photos". In general, these uses of technology are very teacher-directed and do not emphasize hands-on use of technology by students.

Classroom observations showed a similar pattern where most technology use was teacher use of technology. Teachers were observed using interactive white boards (IWB) largely as projection devices to show students various visuals or to replace the function of a conventional whiteboard. In a few observed cases, students were called to the IWB to write, drag images, or otherwise manipulate the computer display. But these instances were relatively rare and did not at any rate evidence student-directed use of technology or the use of technology to develop higher order thinking or learning skills.

Finally, as shown in **Figure Eleven**, Garrison parents note the use of technology to support various NETS-S-aligned student learning skills at the same frequency that their students note.

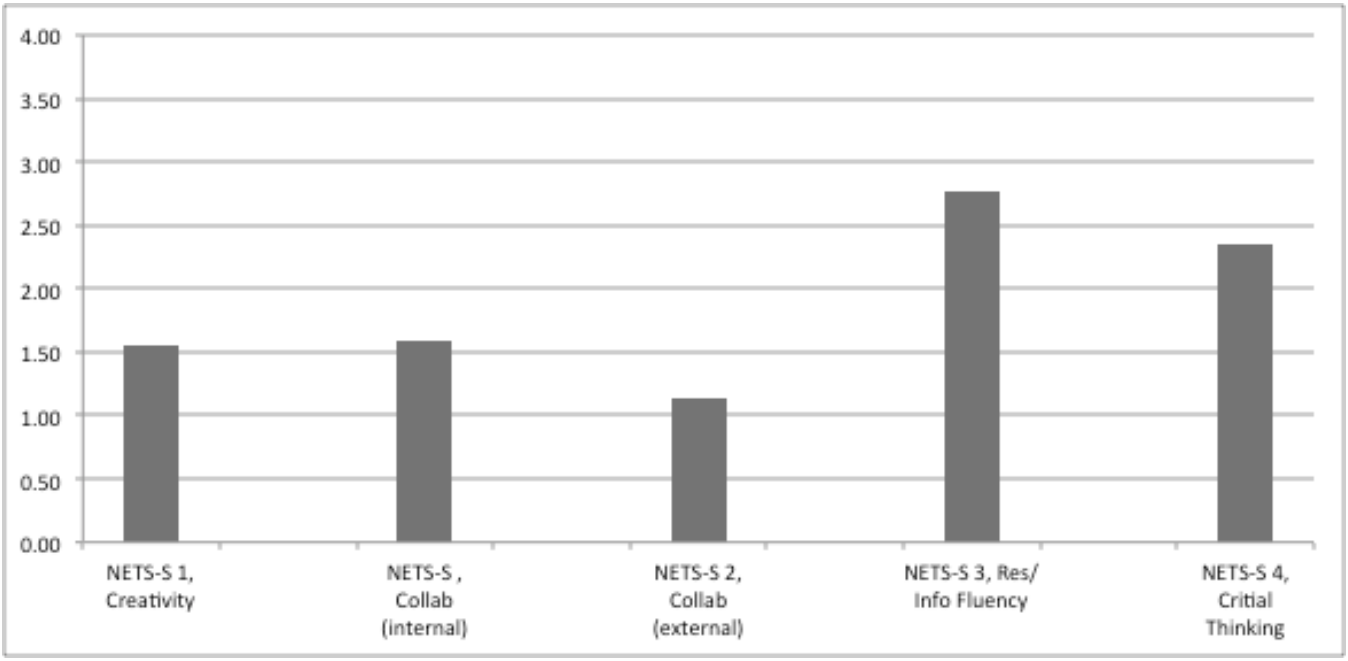


Figure Eleven – Parent responses to online survey question 2, about the frequency with which their students use technology to perform various tasks. For analysis, these tasks are then mapped to NETS-S standards. Scale: 0 = Never, 1 = Several times a year, 2 = Several times a semester, 3 = Two or three times a month, 4 = At least once a week.

As with student and teacher responses to these same questions, parents note that the most frequent use of technology by students is to "gather information and conduct research". For example, several parents noted the use of a particular site (Sheppard Software) that was used to gather information for a state capitals project. A number of parents noted that their child had gone to the Internet at home and/or at school to "find information". The evaluators observed one class where students were directed to a particular website to find pictures for a class project. This instance of use made use of laptops from one of the school's laptop carts, and hence each student was asked to work individually to explore the designated site. This represented a highly teacher-directed use of technology, and one where students had little input into where they would search. Therefore, the expectations related to student critical thinking were found by the evaluators to be relatively low for these middle school students.

Another quite common student use of technology in Garrison School is for building and reinforcing of student basic skills. An example of this is the use of Studyisland.com in classrooms and the computer lab. Parents also noted the use of these sorts of tutorial or skills-development programs by their students. Again, the use of tutorial software, while filling a niche for skills development, is essentially teacher-directed instruction and is not an activity that meets the requirements of NETS-S Standards 1 or 2 (the two standards that focus on the 4Cs).

The evaluators find that there is a technology specialist in the school who works with students around the development of various technology skills – e.g., typing, basics of MS Office – and oversees the school's computer lab. For elementary (grades 2 – 6) students, this interaction amounts to about 15 minutes at the end of the school day once a week. This time is often integrated with library time. There are more structured, quarter-long, computer skills courses for 7th and 8th graders.[7] Nevertheless, it appears that there is not much time available in these courses to acquire depth in basic computer skills, and the 8th grade course largely centers around the 8th grade bridge-building project.[8] This project is very hands-on and collaborative, but does not substantively involve the student use of information technology or other technology tools. As one parent noted:

> *I know the specialist teaches a state-required technology class to middle schoolers, but this class focuses on engineering rather than communication and information--the students build bridges out of toothpicks, old-school technology.*

Overall, the evaluators find that technology, while used in most Garrison classrooms at least infrequently, does little to support the development of student thinking and learning skills. Particularly in upper grades, students are found to use technology tools such as the WWW, word processors, and presentation managers. Nevertheless, this use is oriented almost entirely toward the production of work product or the acquisition of information. While these uses could conceivably support the creativity and critical thinking components of the 4Cs, there is little evidence that Garrison teachers are acquainted with anything beyond the most basic ways to *direct* student technology use in support of these skills. As will be discussed in the next section of this chapter, the underlying philosophy of NETS-S is that students must take ownership over technology use – even in elementary grades – in order to develop the thinking skills associated with its use. In other words, technology use must be *student-centered* in order for students to develop the 4Cs.

Technology Aligned With and Supportive of Standards

The second part of Garrison's student skills indicator states:

> *In keeping with NETS, students at all levels utilize technology within and in support of an environment that is student-centered, project-based, emphasizes inquiry, and generative of the learning skills that frame the Common Core of Learning. Information literacy skills are taught across all grade levels.*

[7] A curriculum guide for the 7th and 8th grade technology courses is included in the Appendix of this report.
[8] The bridge-building project is collaborative and very hands on. It involves designing a bridge, building one out of popsicle sticks, and then testing the design. There is no significant use of technology within this project.

The evaluators understand this part of the district indicator to speak to the types of learning environments in which technology is used as well as to the sorts of standards with which student technology use is aligned. Key here is the call for technology to be used within a student-centered, project-based curriculum. In this regard, the evaluators find that the vast majority – and all that was observed – of student technology use in Garrison school is teacher-directed. To the extent that technology is utilized within projects, these projects are teacher-directed and offer little opportunity for students to take ownership over their use of technology or the learning that's associated with that technology use. For example, students and parents often referenced elementary projects on birds and states as examples of how technology was used to support project-based learning. In their comments, students noted that they "used the computer to get information" and to make presentations. For example:

> *I did a state project. The technology that was used was the internet. It helped me learn by telling me about California*
>
> *How I used technology this year is I researched a bird for my bird project. The way I think the technology helped me learn is that it helped me type faster.*
>
> *I used a computer to do a project on Missouri. We came into the lab to print out papers and study on the state. We went on lots of sources and different websites.*
>
> *I did a bird report and used a computer to research. It helped me because the website I went on had a lot of information.*
>
> *I did a project on homelessness and the internet helped me find the resources I needed for the project technology helped me learn because it gave me the information I needed*
>
> *The computer helped me to get to Wikipedia.*
>
> *I made a power point project on the computer for social studies. I used the computer to search websites to get information for the power point.*
>
> *We make many power point project as well as word document and smart board projects in class. We used the computers located around the school, this helped me learn because search engines can be extremely helpful and the Microsoft programs were easy to use and made for fun slides*

These student-cited uses of online research, typing papers, and making presentations are in-line with what the evaluators observed as well as with focus group and survey data reported by teachers. It is clear to the evaluators that most of the student use of the Internet for "research" is done outside of any formal or focused instruction in information literacy. At lower grades, teachers are very specific that they guide students to particular, approved, sites as it is not in their opinion acceptable for young children to "explore" the Internet. This same philosophy seems to largely hold true for upper grades as well. The evaluators observed students being directed to specific sites for information. This orientation and practice was echoed in student data/comments. In short, while technology seems to have a limited role in student projects, this role is even further limited by the fact that technology use is generally teacher-directed. This is very much *not* in line with NETS, which in Standard 3 (Research and Information Fluency) states that:

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*

Likewise, NETS Standard 4 (Critical Thinking, Problem Solving, and Decision Making) states:

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*

As the standards imply, technology is best integrated within projects, and thereby meets the standards, when it is something that is within the hands of and controlled by the learner. This is largely the point behind project-based learning, and this is clearly expressed as well in the district's student skills indicator. Still, project based learning of any type does not seem to figure prominently in teacher survey, observation, and focus group data.

Several teachers mentioned the Common Core in their comments. For example:

The Common Core state standards require students to be technology ready by college, and students need to be exposed to more technology educationally.

But for the most part, it seems that when Garrison School teachers think of students and technology, they tend to focus on either things that they themselves can do with technology or very basic student technology-using (productivity) skills.

For social studies, you can get much more current stuff. It's not limited to just what you have in the classroom.

They do some game websites for geography. There are great games that they use.

It breaks up the class time. Even if it's just for 6 minutes on Brainpop.

I'm not sure how it can help me beyond providing me with pictures. I want kids to be hands on. At some point I might find something that grabs my attention.

It's helped me as far as teaching trying to find new ideas. Blogs, Pinterist, etc. But that's just for my own usage.

Some of the MS students don't even know how to email.

In short, most technology use by Garrison students seems to be teacher directed, and the vast majority of the time, teacher rather than students are the actual "users" of technology. This is not the intent of the district's indicators nor of the various standards that form current best practice in technology integration. To further illustrate this point, **Figure Twelve**, below, organizes examples of instructional technology use according to the degree to which that use is teacher versus student directed. The figure also maps these uses against an instructional/pedagogy scale that runs also from teacher-directed to student-centered. As can be seen, the most common uses of technology found in Garrison School – teachers writing on IWBs, teacher-assigned WWW research, and student use of computer-based-instruction (e.g., Study Island) – fall well short of the ideal of a truly student-centered, student-directed, use of technology.

It is also worth considering **Figure Twelve** in the context of **Figures Three and Four** (Chapter I). These figures show the relationship between technology use in traditional educational environments versus more student-centered environments (**Figure Three**) as well as teacher behavior while moving from very initial stages of technology adoption to a stage where teachers begin to use technologies in truly transformative ways (**Figure Four**). As Garrison's teachers move toward the district's ideal for student-centered, project-based learning, it will be necessary to begin to implement new pedagogies. Reaching that ideal does indeed require new teacher skills and supports, and these are the subject of the next of Garrison's indicators.

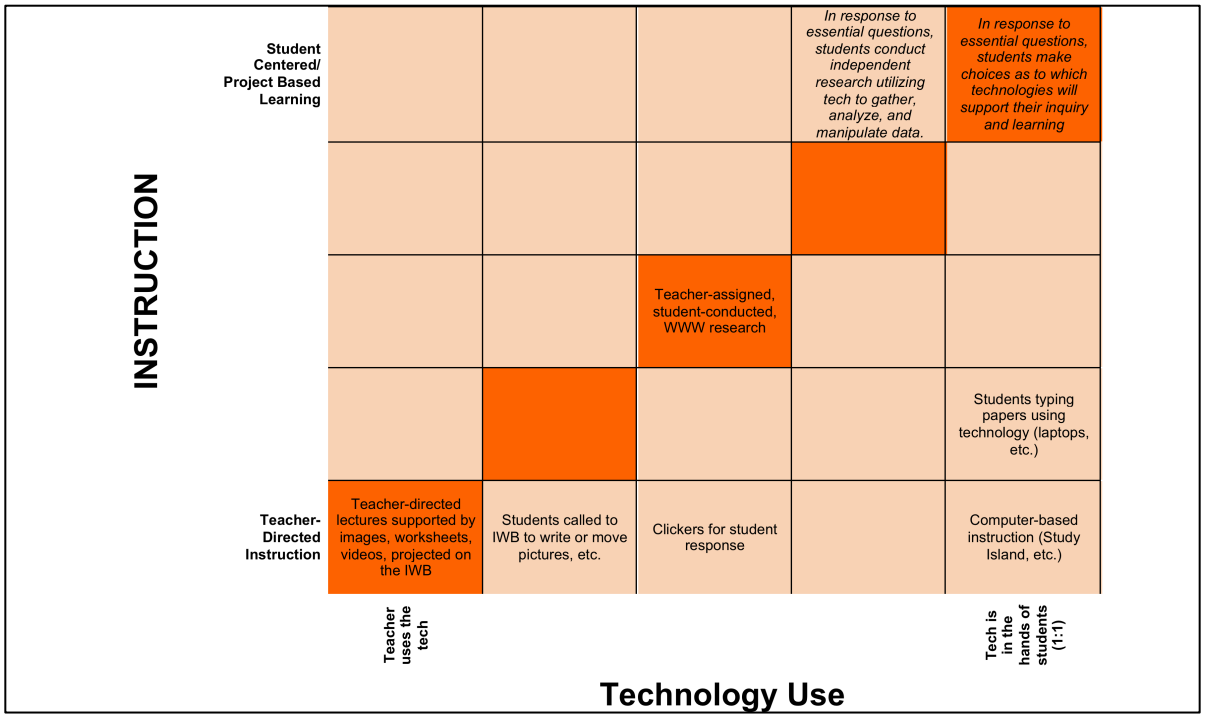


Figure Twelve – Technology use and Pedagogy/Instructional Orientation matrix.

Teacher Skills/Pedagogy

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

> *In line with the NETS-T standards, teachers are skilled in using technology to support inquiry and interdisciplinary, thematic, student-centered learning. Teachers do not fear technology use and its ramifications, but rather realize and actively explore its benefits as a tool for teaching and learning.*

The degree to which Garrison teachers create project-based learning activities for their students has been addressed earlier in the Student Skills and Outcomes indicator discussion. The primary focus in the Student Skills and Outcomes indictor was the use of technology in ways that meet with the NETS-S student standards. In the Teacher Skills/Pedagogy indicator, the degree to which teachers have the skills to employ technology in ways aligned with the NETS-T standards is explored.

Figure Thirteen, below, shows teacher survey responses to a question where teachers were asked how often they used instructional technology within the context of certain teacher activities aligned with NETS-T

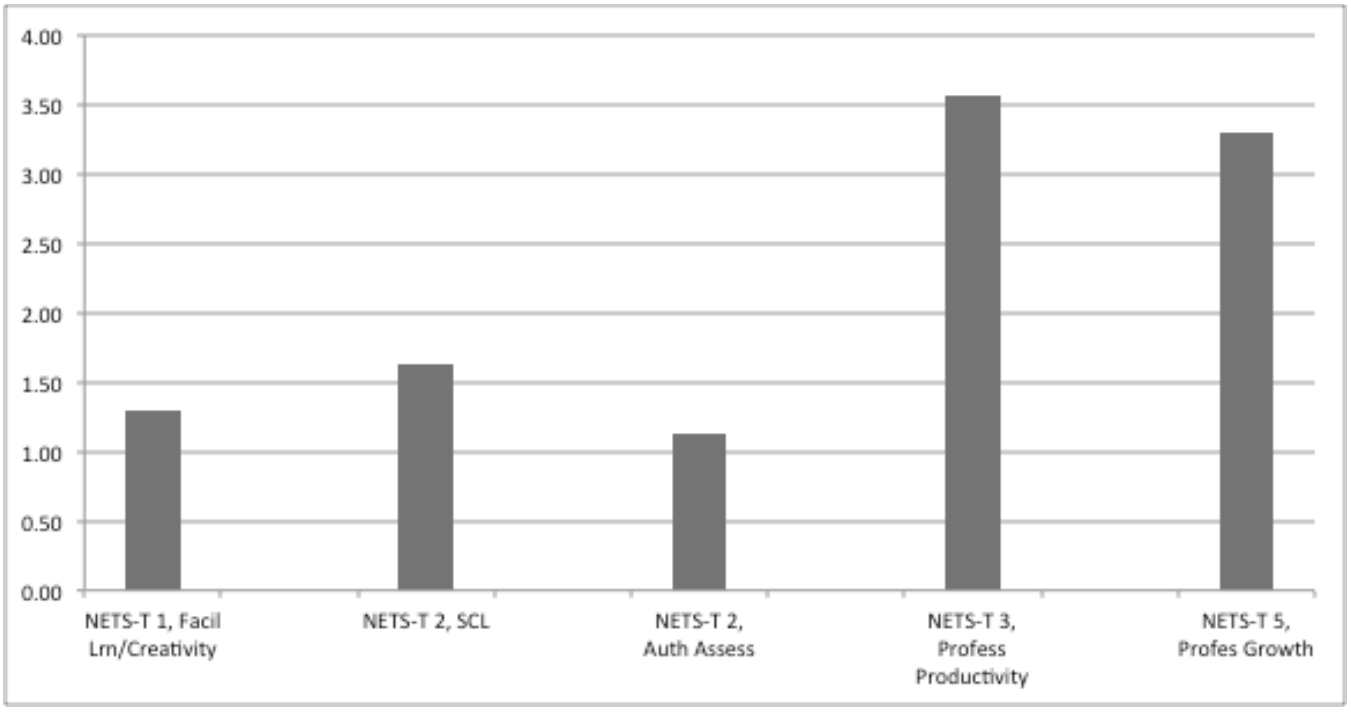


Figure Thirteen -- Teacher responses to online survey question 3, about the frequency with which they use technology to perform various tasks. For analysis, these tasks are then mapped to NETS-T standards. Scale: 0 = Never, 1 = Several times a year, 2 = Several times a semester, 3 = Two or three times a month, 4 = At least once a week.

As can be seen, those activities that involve *students* – such as facilitating creativity, establishing student-centered learning environments, and conducting authentic assessments – rank very low and typically come in at the "several times a year" level. The evaluators believe that this is an accurate assessment overall but that it also reflects an average. That is, some teachers do indeed engage in these sorts of activities often, but the vast majority hardly do these things at all, and hence the average "several times a year" across the faculty. Teacher data from observations and interviews (discussed in the previous section of this chapter) support this survey data.

Figure Fourteen, below, summarizes teacher survey data where teachers were asked to agree or disagree with various statements probing their own understandings of how to employ technology within the instructional environment. Here, teachers can be seen to generally agree with the idea that they have the skills to use technology to "successfully differentiate instruction" for their students, but are still only slightly over neutral in their agreement that they have skills to develop project-based learning experiences and about how technology supports the common core. The evaluators find that this data resonates with observations and focus group data where teachers generally expressed an opinion that by allowing each student to create their own work product (e.g., a PowerPoint presentation) or to progress through Study Island at their own pace, they were differentiating. On the other hand, teachers and administrators readily expressed the opinion that teachers were apprehensive around many aspects of project-based learning and the use of technology (and project-based learning) in the Common Core.

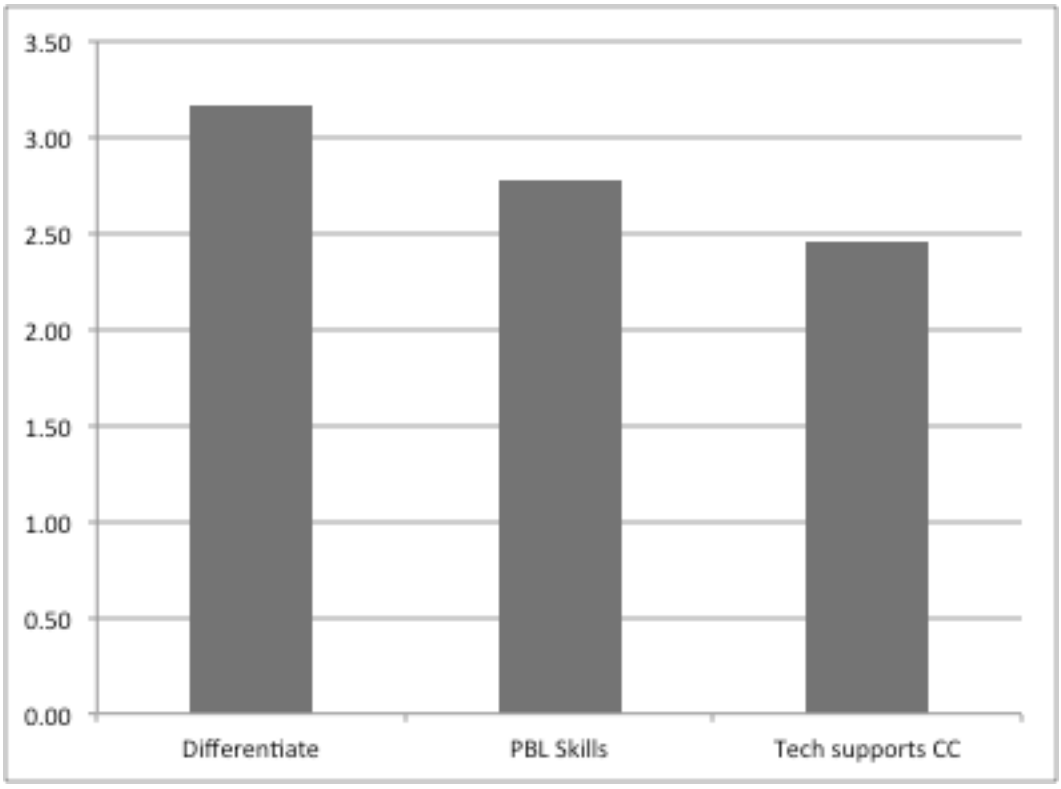


Figure Fourteen - Teacher responses to survey question 4 (g – i), probing for their degree of agreement with statements expressing that students have the skills to use technology in various ways. Scale: 0 = Strongly Disagree, 1 = Disagree, 2 = Neutral, 3 = Agree, 4 = Strongly Agree.

As has been discussed in the previous section, it is clear to the evaluators that most Garrison teachers, while basically proficient in the operation of commonly available teacher technologies (IWBs and

productivity tools) do not integrate technology within the instructional environment with the intentional purpose of supporting project based learning that is generative of the 4Cs and supportive of NETS-S standards. Administrators, parents, and teachers themselves are clear that they do not feel that all Garrison teachers have these skills:

> *We should get away from the teachers who just open the book and read to the kids. There are many teachers like that here. I find that to be a waste of time. (parent)*

> *I believe that the use of any tool, be it related to technology or not, has to be within a teacher's comfort zone which may require more training for some teachers than others. As the district decides to upgrade or introduce new hardware or software, teachers will require additional quality training and TIME to use the tools and create lessons. (teacher)*

> *...like a classroom, you have differentiated abilities. We have some teachers who are so on with technology and explore so much. We have other teachers who do very little [with technology]. (administrator)*

> *Technology should be a tool that you are so comfortable with that it is integrated seamlessly into your teaching. training and time are required to become proficient. Then some more training. (teacher)*

Since the data clearly shows that Garrison teachers are not meeting the district's indicator for Teacher Skills and Pedagogy, the question that must be asked is why not. The evaluators find that the answer to this question is related to the remaining two district indicators – Role of the District and Infrastructure.

Role of the District

Garrison's indicator for the Role of the District states:

> *The district insures that there are ample opportunities for – and a culture that supports – informal learning, conversations, and the development of teacher skills in technology and pedagogy. District policies on technology are clearly communicated to the entire community. Professional development exists to interweave technology with broad initiatives such as the Common Core and inquiry-based learning.*

This section of the district's indicators describes how the district – administration particularly –supports its expectations for how technology is used to support teaching and learning and then how it communicates those expectations to the Garrison School community.

Professional Development Culture

Garrison's indicator makes a very clear case for a particular kind of professional learning culture around technology integration. Overall, it can be seen that there should exist "ample opportunities" for such learning and that these are intended to be informal, just-in-time, and job-embedded. The evaluators find that while indeed most technology professional development for Garrison teachers is job-embedded and informal, there is in general a significant lack of professional learning time and opportunity devoted to

technology integration. What is surprising is that while teachers note this deficit, they do so in rather round-about ways which are indicative of the rather low priority that technology integration has in most teachers' perceptions of the learning environment. In other words, it appears that Garrison teachers have so little experience with technology professional development that they do not strongly notice its absence.

Professional development only came up as a minor and final point in the teacher focus group, with teachers noting that they would like more time to experiment with programs that they were introduced to during annual training days. In survey responses (see **Figure Fifteen**, below), it is clear that teachers are not strongly interested in professional development that relates directly to technology, but are interested in training that relates to integration. This of course is the sort of professional development that works best as a job-embedded activity that involves time for reflection on how technology is best woven into pedagogy. In their survey comments (aside from the specifics of question 5), teachers made virtually no mention of professional development.

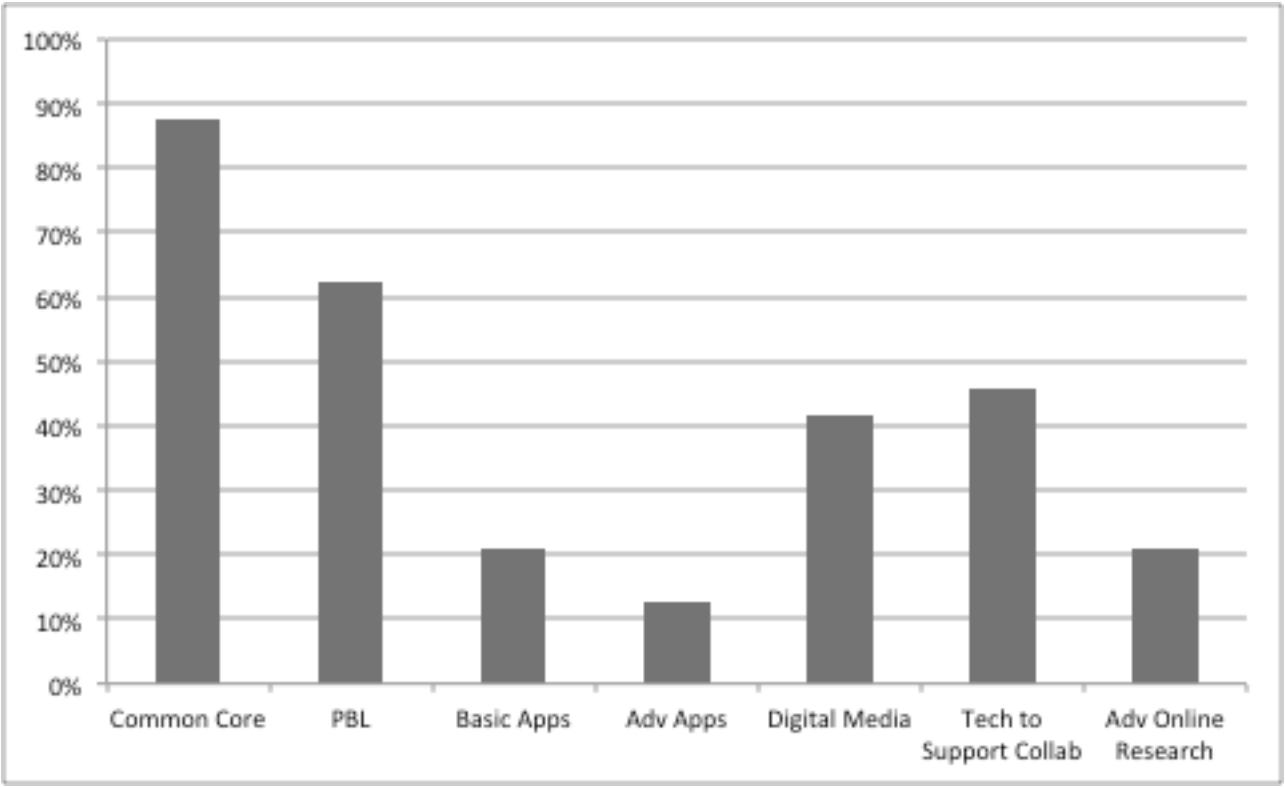


Figure Fifteen – Teacher survey responses to question 5, asking if they would like to receive professional development on various topics related to technology integration.

The evaluators note that the district has a full-time technology specialist who works to support teachers in their use of technology within the instructional environment. This one position serves every teacher in a variety of different ways. As teachers note:

> *We have one person and she's very busy. I feel bad about asking her for things she's so busy. It'd be nice to have a team.*
>
> *She does more than humanly possible.*

The key issue here is that the technology specialist has historically spent most of her time dealing with technical support and actually running technology classes in the school's computer lab. While the recent hiring of a one-day-a-week on-site technical consultant should relieve some of the technical support burden, the likelihood is that the technology specialist will never truly be in a position to *primarily* provide teacher professional development so long as she is also responsible for teaching students.[9] Further, teachers who have grown accustomed to asking the technology specialist for technical assistance will likely continue to do so, practically avoiding the technician who will be in the building much less than the technology specialist and who is a much less well-known entity to faculty. Both of these factors serve to undercut the fulfillment of what both teachers and parents have identified as a role for in-building professional development support:

> *…ongoing support also needs to be provided to teachers so they are comfortable using technology in the classroom.*

> *Perhaps we need an additional staff slot for a technology guru? (I don't know how to describe the role, but it is not maintenance-based but rather visionary, creative, enthusiastically leading the technology charge for the whole school.) We need someone on staff who knows technology, loves technology, breathes technology, is up to date on all the latest technology developments especially those within education, and spends many hours each week teaching students and teachers how to use the latest technology to achieve the district's learning goals.*

Communication of Expectations, Policy and Vision

Garrison teachers and parents had much to say about the community's expectations for how technology should support teaching and learning in Garrison School. One teacher summed this up by talking about the "cyclical" nature of parent expectations:

> *It's cyclical. We now have a group of parents who want the kids outside and not so much on the computer. The library instruction became computer instruction because that's what the parents wanted, but now they [have changed their minds and] want library and not computer.*

This sort of divergent parent opinion is reflected in parent survey comments. Many parents offered comments critical of – or at least skeptical of – technology's role in teaching and learning:

> *I'm not interested in increasing the use of technology at school. I'm interested in students reading books, writing, exploring nature, music and art, without the use of technology in elementary school. There is no reason to "teach" technology. Kids learn it themselves. … We do not allow the use of the web, TV, phones, etc. in our house. I really would prefer that my kids are not exposed at school either. Because this type of technology is not allowed at home, our kids spend hours reading and engaging in creative play. At this age, I think this is a much more valuable use of their time.*

[9] Part of the problem – and this opinion is informed by common experience in typical schools and districts – is that when a school has a "computer teacher", it becomes somewhat unlikely that classroom teachers will willingly take on the role of integrating technology routinely in their classrooms. The typical pattern is that more and more of the computer teacher's time is spent teaching in the lab and precious little time is available for supporting job-embedded professional development.

Technology can make collaboration and research easier, but it is still (or it is more) important to develop critical thinking.

I like how they still come home with books and that their homework is not dictated by use of the computer. Electromagnetic radiation is real and computer use should be used in a balanced way.

On the other hand, other parents offered a very different perspective:

We have a wonderful opportunity here to not just catch up on technology at our school, but to leapfrog into the technology-driven educational world of the 21st century. The technology should drive the educational vision and practices--not the other way around. The technology that we invest in should change the way teachers approach everything they do. This is a very exciting time for our school! We don't need to spend a ton of money up front, but we need a vision and a plan for technology investment and implementation that is ongoing and ever-adapting. ... We need a technology plan that doesn't just move us from ten years behind the times to five years behind the times--we need a plan that keeps us progressing and improving and staying on top of the latest technological and pedagogical developments.

Sensitive to these strongly held yet seemingly contradictory opinions, it appears that Garrison School is currently attempting to stick to a middle course that accommodates both types of parent opinion. Unfortunately, as the last parent comment above notes, what is missing is a technology plan that articulates a specific vision – and path – for the school to follow in meeting these various needs. As a result, parents consistently note that there seems to be no real logic or consistency as to how technology is utilized throughout the school. For example:

There is no continuity. No consistent correlation between technology and the curriculum. It's a la carte.

We've only been at Garrison for a year and a half. At the previous school, tech was available in the classroom and woven in. There was a curriculum that was actually utilized by the teachers. Not the case here. It's very random here.

Chaos. There is no strategy.

When asked the extent to which they agreed with a statement that they "understand Garrison's vision for how technology is intended to support teaching and learning" (parent survey question 4l), parents mildly *dis*agreed with this statement. When teachers were asked the same question, teachers registered only between "neutral" and agreeing with the statement. Ideally of course, parents and teachers would strongly agree with this statement if there was indeed a vision in place and it was well-communicated. This does not presently seem to be the case.

Infrastructure

Garrison's indicator for infrastructure states:

> *The district's technology infrastructure for communication, collaboration, and sharing is robust, available anywhere in the school building, and is designed first and foremost to support the needs of students and district staff. Policies related to use and support are user-friendly and clearly communicated to all users. Technical support is on-site and meets the needs of all users.*

Devices and Network

The evaluators find that most Garrison classrooms are equipped with an array of devices that seem typical for schools in this part of the country. Specifically, most classrooms have interactive white boards, several student workstations (desktop computers) and wired Internet connectivity. Teacher workstations are typically laptop computers, and there seems to be wireless connectivity in most (but not all) parts of the school. Most classrooms have some sort of printer available, and many (but not all) teachers have document cameras. There is a library-based computer lab, and a laptop cart.

The biggest "problem" with Garrison's existing infrastructure is the age of much of it. Workstations and laptops seem to be about six to eight years old, and are therefore not up to modern specifications. In this Windows-based environment, nearly every device is still running XP and is therefore at least one generation of the operating system out of date. Students note that the laptops are "very slow" and often "do not work". The evaluators note that this could be due to the slowness of the district's Internet connection (it's only 3mb/sec for the entire building) as well as various problems with the wireless network. The wireless network appears to be constructed out of mostly consumer-grade wireless access points and is thus not really suitable for a robust school network with a capacity to support the entire building.

So in terms of its Infrastructure indicator, the evaluators find that Garrison is mostly meeting the indicator *now*, but that the infrastructure is not quite "robust" in that it is relatively old and could be upgraded in several ways to meet higher demand.

Technical Support

It appears that Garrison is in a transition period with regard to technical support. A new contractor for technical support has been retained, and the evaluators find that expectations are high that this contractor will meet teachers' needs. This support will be in addition to the on-site support offered currently by the school's technology specialist.

III. Recommendations

In consideration of the previous chapter's findings, the evaluators have a range of related recommendations for the district to consider as it advances its use of technology to support teaching and learning. For the most part, these recommendations represent very basic actions that the district should perform which would have significant ramifications on how the district performs in terms of meeting its indicators for Student Skills as well as Teacher Skills/Pedagogy.

These recommendations have been reviewed and refined with the Garrison technology evaluation committee in a meeting held on March 19, 2013.

Develop a Comprehensive Vision for Technology's Role in Teaching and Learning

As noted in the findings related to the Role of the District, Garrison does not presently have a commonly-held vision for how technology should support teaching and learning. This lack of common vision means that many teachers, and even more parents, are unclear as to how they should use and think about technology within the educational environment. Parents view technology use as "contested terrain" and therefore variably promote greater or lesser amounts of technology use. Teachers tend to integrate as much technology as fits their comfort level. The end result is confusion and an inequitable experience for students.

The evaluators cannot, and should not, mandate an appropriate vision for Garrison School. Nevertheless, what can be said is that the vision should have the following components:

- Technology should be in support of the district's core values related to curriculum and instruction. It is certainly realistic for the vision to relate to technology's role in supporting the development of student thinking and learning skills; much as is the case in the Student Skills and Teacher Skills/Pedagogy indicators. Still, it is critical that those thinking and learning skills, and related pedagogies, be accurately reflected in teacher practice. This implies that the district needs to drill down into its vision for curriculum and instruction and find a realistic, common, understanding of what students need to know and how teachers should teach *independent* of technology integration. Once that has happened, the district can map technology onto the processes needed to reach those agreed-upon learning outcomes.

- The vision needs to be one to which the entire community subscribes or buys into. This will be a challenge in a community with diverse and strongly held beliefs but it is essential for moving forward. Garrison is a small community and thus cannot really afford to move ahead with only some of its population on-board with the vision. The process of gaining full buy-in will require an open and inclusive process for planning.

The evaluators recommend that Garrison start with its Student Skills/Outcomes and Teacher Skills/Pedagogy indicators as a basis for a vision for technology integration. At present, these indicators seem to express more of a visionary ideal than actual reality in terms of what is happening in Garrison's

classrooms. Therefore, the indicators exist as a good basis for district goals; and these goals could be the foundation of a new Garrison strategic instructional technology plan.

Engage in Exemplar-Producing Professional Development

It is quite likely that very few Garrison teachers have a good working knowledge of what it actually "looks like" to produce instructional activities and an instructional environment that incorporate student-centered technology use for the development of the 4Cs. For example, teachers may feel that they are supporting "inquiry" by directing student "online research". But do teachers truly have an understanding of inquiry (that goes beyond "research"), and do they have strategies for encouraging student ownership of learning? To develop these understandings and strategies, teachers need high quality professional development. The evaluators recommend that Garrison seek out such resources and find ways to bring such training into the district in a system and sustained way.

One objective of such professional development would be to begin to establish a set of "exemplars" for effective technology integration, mapped onto Garrison's actual curriculum. As more teachers engage with the exemplars, and develop their own activities, the district could begin to grow a portfolio of technology activities that support the curriculum as well as existing standards frameworks such as NETS-S.

Another goal of the district's technology professional development should be to familiarize teachers with the NETS standards and the connection between these standards and existing initiatives such as the Common Core and 21st century learning skills. Through such familiarization, teacher anxiety about technology integration being "one more thing" can be allayed. Teachers should be shown that technology is a pathway for facilitating reaching existing objectives. At present, this understanding does not widely exist among Garrison teachers.

As a related matter, the district should consider refining the job description of the technology specialist to make it clear that the position is one which is focused on teacher professional development rather than direct student instruction and/or technical support. If it helps in this regard to increase the amount of technical support coming into the district (so as to take the technical support burden entirely off of the technology specialist), then this should be considered as well.

Develop a Plan for Infrastructure Upgrades and Improvements

While the evaluators are careful to note that at present infrastructure *is not* a higher priority for Garrison than a clear vision for technology integration and a robust capacity for teacher professional development, it is nonetheless clear that much of the infrastructure is aging and a replacement cycle should be planned and implemented.

As an initial move, the evaluators recommend that the district increase its incoming network bandwidth from the current 3mb/sec. Industry standards recommend about 25mb/sec of incoming bandwidth for a district the size of Garrison.[10] Upgrading bandwidth would be a relatively simple way to "meet teachers

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

halfway" as the district encourages teachers to maximize the use of existing technology prior to purchasing much new hardware.

As for hardware upgrades, teacher and student laptops should be replaced within the next year with modern devices. Part of what should be considered when planning these upgrades is the fact that many students, and some teachers, will want (and can use) tablet devices instead of full-scale laptops. It is essential that the district open its network and infrastructure plan to desktops, laptops, and tablet (e.g., iPad) devices.

The district should plan on a network upgrade that creates the ability to integrate a wider variety of devices (see above) into the network in a safe and secure manner. Part of this will be planning to incorporate student and teacher owned ("byod") devices into the network. Naturally, another part of this work will be the upgrading and expansion of the current wireless so that it covers the entire campus with a commercial-grade network.

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.

d. Plan strategies to guide inquiry
e. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
f. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
g. 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.

e. Identify and define authentic problems and significant questions for investigation
f. Plan and manage activities to develop a solution or complete a project
g. Collect and analyze data to identify solutions and/or make informed decisions
h. 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

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 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 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

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 , 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 , 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

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 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

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 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 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 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)

Garrison's 7th and 8th Grade Technology Curriculum

Seventh Grade Technology Curriculum Guide

One Quarter of Instruction based upon New York State Technology Standards and National Technology Standards:

* Digital Citizenship
  - Internet Research Skills
  - Evaluation of Web Sites
  - Internet Safety – Personal and Private Information

* Computer Hardware

* The Dynamics of Flight – Airplane Project (Science & Technology)

* Spreadsheet & Graphing using Microsoft Excel (Math & Technology)

* Historical Technology Invention

Eighth Grade Technology Curriculum Guide

One Quarter of Instruction based upon New York State Technology Standards and National Technology Standards:

* Graphics Design using PowerPoint Drawing Tools

* Bridges
  - Understanding three primary structures and forces that affect bridges
  - Develop plans, including drawings and measurements and details of construction
  - Develop a model of construction
  - Test efficiency of bridge model

* Impacts of Technology
  - Understanding new technologies evolve as a result of combining existing technologies
  - Positive and negative impacts on individuals, society, and the environment.

* Digital Citizenship
  - Internet Safety - Cyberbulling
  - Copyright and Fair Use Guidelines

* Spreadsheet & Graphing using Microsoft Excel (Math & Technology)

Data Collection Instruments

Surveys

Teacher Survey - http://www.sun-associates.com/garrision/gufsteacher.html
Parent Survey - http://www.sun-associates.com/garrision/gufsparent.html
Student Survey - http://www.sun-associates.com/garrision/gufsstudent.html

Principal Questions

(intro text) This interview is part of Garrison's evaluation of how instructional technology is used to support teaching and learning in the school. Sun Associates has been tasked with conducting this evaluation. In addition to this interview, we have conducted an online survey and will be visiting all classrooms in the school. We are also focus grouping parents, the technology committee, and will survey students. Ultimately, this evaluation will be reported to the district in the early summer and will form the basis for a new strategic technology plan to be developed by the Fall.

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.

Any questions? OK, let's go!

1. As a way of getting started, could you give me an example of a student activity that you have seen taught (by a teacher in this building) that is does what you feel is a exemplary job of integrating technology as an aid in student learning?

2. How typical is this for the teachers in the school?

3. What's your vision for the role of technology in the school?

4. To what extent do you feel that your teachers have the skills to use technology in the way that you envision?

5. What barriers exist to realizing this environment/vision? (probe for PD, resources, policies, skills/knowledge, etc.)

6. What sorts of policies 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

(intro text) This focus group is part of Garrison's evaluation of how instructional technology is used to support teaching and learning in 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 classrooms in the school. We are also interviewing principals. Ultimately, this evaluation will be reported to the district in the early summer and will form the basis for a new strategic technology plan to be developed by the Fall.

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. Please describe an actual lesson or activity from your classroom that incorporates technology.

2. What value does technology bring to the learning in this activity?

3. Can you describe your vision for how technology can ideally support learning?

4. Can you identify any elements of the environment in Garrison School that you feel specifically support or detract from your ability as a teacher to integrate technology within your instructional environment?

5. To what extent do you feel that your students have the skills (attitudes, dispositions, ???) necessary for using technology in a meaningful way in the classroom? (prompt for info literacy)

6. 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

(intro text) This focus group is part of Garrison's evaluation of how instructional technology is used to support teaching and learning in 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 classrooms in the school. We are also interviewing principals. Ultimately, this evaluation will be reported to the district in the early summer and will form the basis for a new strategic technology plan to be developed by the Fall.

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. As a way of getting started, could you give me an example of something that you can recall your student doing this year that you feel did an exemplary job of integrating technology as an aid in student learning?

2. In general, what sorts of student learning skills *do you believe* are fostered by the use of technology?

3. What do you believe is the best way for students to utilize technology within the context of learning?

4. What barriers are you aware of that might exist to realizing this environment/vision?

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 Garrison School, do you feel that his/her exposure to technology-supported learning has been more or less consistent throughout the years? Why or why not?

7. Anything else you want to tell us about your child's experience around technology integration or the use of technology in school?

Technology Committee Focus Group Questions

(intro) This focus group is part of Garrison's evaluation of how instructional technology is used to support teaching and learning in 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 classrooms in the school. We are also interviewing principals. Ultimately, this evaluation will be reported to the district in the early summer and will form the basis for a new strategic technology plan to be developed by the Fall.

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's the role of this Technology Committee?

2. What's your vision for how technology can support teaching and learning?

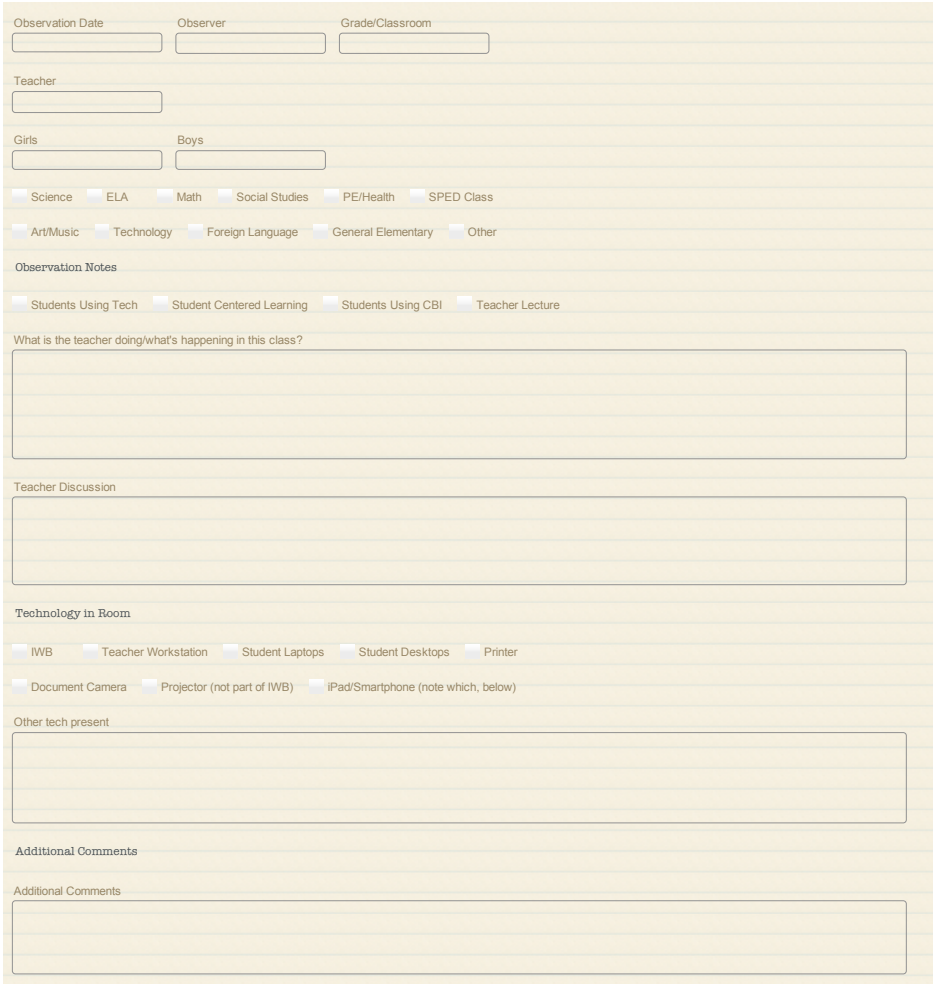
3. How is this vision expressed and communicated to a) teachers and b) parents and the broader community?

4. Can you identify any elements of the environment in Garrison School that you feel specifically support or detract from teachers' ability to integrate technology within your instructional environment?

5. To what extent do you feel that Garrison's students have the skills (attitudes, dispositions, ???) necessary for using technology in a meaningful way in the classroom? (prompt for info literacy)

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

Classroom Observation Protocol



Observation Date | Observer | Grade/Classroom

Teacher

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