Instructional Technology Program Review

*Mt. Vernon City School District – Summary Report*

May 2013



55 Middlesex Street, Suite 216

North Chelmsford, MA 01863

www.sun-associates.com

**Contents**

I. Program Review Summary 3

Purpose and Background to This Review 3

Summary Findings and Recommendations 4

Organization of the District’s Indicators 4

Summary Findings 4

Overarching Finding 4

Student Learning and 21st Century Skills 5

Teacher Skills and Pedagogy 9

Summary Recommendations 15

Shared Vision 15

Implementation Planning 15

Consistent and Adequate Funding 16

Equitable Access 16

Skilled Personnel 17

Ongoing Professional Learning 17

Technical Support 18

Curriculum Framework 18

Student-Centered Learning 18

II. Methodology and Conceptual Framework 21

Methodology 21

Indicators and Data Collection 21

Conceptual Framework for Mt. Vernon’s Indicators 23

The ISTE NETS Standards 23

Background to the NETS Standards 25

III. Appendices 27

Mt. Vernon’s Technology Program Review Indicators 27

Other NETS Standards 29

NETS - A 29

NETS - C 31

NETS – S Student Profiles 34

Data Collection Instruments 37

Surveys 37

Principal Questions 37

Teacher Focus Group Questions 38

Parent Focus Group Questions 40

Classroom Observation Protocol 41

# I. Program Review Summary

This report is a condensed summary of the full report that is the final product of Mt. Vernon’s Instructional Technology Program Review.

The full report – to be produced after this summary is reviewed by the district’s program review committee – will contain more data detail in the findings. It will also provide more detail in relation to the recommendations.

## Purpose and Background to This Review

During the 2012-2013 school year, the Mt. Vernon City School District initiated an evaluation of their instructional technology program. Sun Associates, an educational consulting firm with strong expertise in instructional technology program evaluation and strategic planning, was hired by Mt. Vernon in collaboration with the Lower Hudson Regional Information Center (LHRIC) to facilitate this evaluation. Sun Associates worked with the district to frame the evaluation as a comprehensive review of how instructional technology impacts the overall teaching and learning environment in Mt. Vernon. The resulting instructional technology program review is the basis of the following report.

The program review aims to provide a current-status snapshot of teacher, administrator and parent attitudes, beliefs, skills and aspirations for the use of technology to support teaching and learning. It is anticipated that Mt. Vernon will use this evaluation to create and clarify the district’s work in instructional technology. Ideally, the district will also gain insight into the variety of ways that instructional technology fits into the district’s overall vision for teaching and learning. To the extent that the district needs to clarify and review its overall vision, the data arising from this review should be useful in that process.

Through meetings and discussions with a district committee of stakeholders including teachers, administrators, and technology staff the evaluators facilitated the creation of visionary performance indicators around instructional technology use (see the **Appendix** for a copy of the full text of the district’s indicators). These indicators were created by the program review committee to reflect *the ideal use* of technology in Mt. Vernon’s schools, and were then used as benchmarks against which to measure current technology use.

Please note that all quotes from Mt. Vernon teachers, parents and administrators presented as indented *italicized* text in this report are offered in the format they were received. The evaluators have made no effort to correct spelling, capitalization, grammar or other aspects of the data subjects’ original written or spoken comments. Where edits have been made for clarity or to ensure confidentiality, those edits are enclosed in [ ] symbols. Quotes are not attributed to individuals per the evaluators’ data confidentiality agreements with all data subjects.

## Summary Findings and Recommendations

Over the course of the program review process, the evaluators spoke with and listened to a large number of Mt. Vernon teachers, parents and administrators. Analysis of the resulting data has resulted in a number of findings related to the areas where district performance does not meet the ideal expressed in the indicators. Subsequently, the evaluators have developed recommendations for how the district can improve its performance.

### Organization of the District’s Indicators

The district has developed three highly descriptive, and very visionary, performance indicators to guide its program review and to express its intent for how technology is to be used to support student learning (see **Appendix**). These indicators reflect similar goals as those described in the National Educational Technology Standards (NETS) set forth by the International Society for Technology in Education (ISTE). As explained in greater detail below, the NETS standards articulate a unified, inter-related set of objectives for how technology should be used to support student-centered learning and the development of life-long learning skills. The basic thrust of the review effort in Mt. Vernon has been to determine the extent to which current technology practice in the system fits within the framework of the committee-created indicators, ISTE NETS, and similar best practices.

### Summary Findings

#### Overarching Finding

Several quotes from Mt. Vernon teachers and parents work to sum up what the evaluators find as a pressing, overarching, issue in Mt. Vernon schools. Specifically, data coming from teachers, administrators and parents and via the evaluators observations in all district schools point to the simple fact that Mt. Vernon schools lack virtually all of the technology infrastructure necessary to make any sort of effective use of technology.

*The computers here at [this elementary school] are older than my fourth grade students. Many days I try to log on to eschool to complete the attendance and my own dell computer won't sign on. Half of the computers in our computer lab don't work so it is extremely frustrating to take a class in there and spend most of the period getting computer to sign on. An investment must be made in technology in order for teachers here … to use computers for assessment purposes.* (Elementary Teacher)

*The district needs a complete technology overhaul. Our website is a mess - nothing is up to date. There is no form [of] communications beside phone blasts and paper. [This elementary school] has nothing in terms of technology. The children can't even go to the library since we don't have a media specialist. My 4th grader has never had access to computers in class unless a teacher had brought their laptop from home. My student understands technology only because she has learned at home.* (Elementary Parent)

*About 11 years ago, for a short period of time I was allowed to use a classroom set of laptops for my students. It was an experimental project and after a year I never got to use the laptops again. The Internet was a wonderful resource for my students to research information in real time. I could help them immediately if they ran into a dead end while researching. Since then I only have an overhead and one computer, sometimes a tv.* (Secondary Teacher)

*It would be a very good thing to have technology in all of the Mount Vernon schools from elementary thru high schools* (Secondary Parent)

In the course of conducting this program review, the evaluators encountered very little data that would contradict or contrast the above opinions expressed by teachers and parents. The overall technology situation in the district with regard to *all* aspects of technology integration is such that there is essentially *nothing* to report about the district’s systemic progress toward meeting its developed indicators. To be sure, there are many teachers and parents who report what they *would like* to do with technology. There are a few examples of teachers making the best use out of what little they have, and there are many reports of parents working with their children at home on various technology-infused/supported activities. There is a strong trend in the data (discussed in relation to the Policies and Procedures indicator, below) where teachers and parents express a personal vision for technology that meshes well with the district’s indicators and national standards/best practice. The fact remains that there is nothing systemic about any of these positive findings. Rather, the overall impression is that there are various “points of light” in Mt. Vernon schools and among the district community. These points of light are not driven by the district or uniformly supported by district actions.

As matter of due diligence the evaluators have proceeded to address findings for each of the district’s three indicators, but the clear bottom line is that given a lack of technology infrastructure, instructional support, and professional development, Mt. Vernon is sadly far from meeting the visionary indicators it has established for its instructional technology program.

#### Student Learning and 21st Century Skills

Mt. Vernon’s indicator for Student Learning and 21st Century Skills states:

*Working in a technology-infused educational environment, Mt Vernon students create a variety of products, communicate and collaborate locally and globally, engage in authentic tasks, and investigate real world problems utilizing real and relevant data. Students take ownership over their learning and utilize technology to acquire and analyze information to fuel their research and thinking. Students have skills in evaluating data and information resources for their validity as well as in discerning which resources or technology would provide the most appropriate solution for completion of a task.*

*Students gather information to construct meaning, apply concepts, and present findings through a variety of vehicles. Students envision themselves as members of a global community while practicing safe, legal and responsible use of information and technology.*

To a large extent, this indicator maps directly to the ISTE NETS-S technology standards. These standards have been developed to provide educators with guidance as to how best utilize technology tools to support the development of 21st century skills such as communication, collaboration and information literacy. While the standards do address basic technology skills (use of basic applications, etc.), these basic skills are always conceptualized in NETS as simply a path toward meeting what are in fact lifelong thinking and learning skills.

In order to respond to this indicator, the evaluators surveyed[[1]](#footnote-1) teachers as to the frequency with which they developed technology-supported learning activities that the evaluators then mapped on to the NETS-S skills. This data is shown in **Figure 1**, below.

Here it can be seen that in a number of the NETS-S skills categories – notably, NETS-S standard 1, using technology to support creativity – elementary teachers on average report that they very nearly never conduct activities that meet this standard. Secondary teachers are not far off from this mark. At best, teachers report meeting NETS-S standards just somewhat more than “once a year”. Furthermore, teachers were generally unable to provide the evaluators with any specific examples of the various things that they have done in their classrooms that support these queried NETS-S skills. The evaluators’ classroom observations confirm this data. Of the well over 100 classroom observations recorded, fewer than 10 found students using technology, and most of these instances were students using very simple computer-based-instruction (CBI) packages. It is clear that for the most part, Mt. Vernon students at all levels simply do not use technology within the classroom environment.

The evaluators also surveyed teachers about their beliefs related to student technology use. This data is shown in **Figure 2**, below. Here teachers were asked if they felt that their students demonstrated critical thinking skills, could appropriate select technology tools, were safe and ethical users of technology, and had basic grade level appropriate skills in using technology. As can be seen, teachers at all levels *disagreed* with positive statements asserting that students had these skills. Likewise, not surprisingly, teachers strongly disagreed that students had sufficient access to technology at school.



**Figure 1** - 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.



**Figure 2** – Teacher belief statements, survey questions 4a – 4g. 4 = Strongly Agree, 3 = Agree, **2 = Neutral**, 1 = Disagree, 0 = Strongly Disagree

Parent data on these same questions – NETS-S and the various topics covered in teacher survey question 4 – tracks very close to teacher data. This data is shown in **Figures 3** and **4**, below. Parent data on student technology use is slightly more positive than teacher data, but this is due to the fact that many parents based their responses on activities that their children do *at home*. It was often stated in parent data that their children’s only access to technology is at home and that there were no functional computers available in their child’s classroom.



**Figure 3** -- Parent responses to online survey question 2, about the frequency with which students 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.



**Figure 4** -- Parent agreement with belief statements, survey questions 3a – 3g. 4 = Strongly Agree, 3 = Agree, 2 = Neutral, 1 = Disagree, 0 = Strongly Disagree

In text comments, some teachers note the use of various CBI systems such as Plato, Raz Kids and Waterford. The evaluators observed Waterford being used in a number of elementary schools, although in many cases teachers noted that the large number of “broken” workstations in their classrooms prevented efficient use of the system. While CBI programs such as Waterford and Raz Kids in fact do little to meet the district’s indicators for student-centered learning, they do represent at least some potential student use of technology aligned with some instructional objectives. Nevertheless, it appears that such programs are not implemented in any systemic way throughout the district. Some schools have these systems and some do not. Most significantly, where the systems do exist, they are often down or in limited use due to malfunctioning workstations. Every lab observed by the evaluators contained at least a few machines that were broken or not functional.

In short, the evaluators find little to no evidence that students are working with technology in any of the ways that meet the district’s indicators. While it is no doubt the case in a district the size of Mt. Vernon that *someone* is using technology regularly in ways that meet with the indicators and NETS, it is clear that no such activity is occurring in any systemic or widespread manner within the district.

#### Teacher Skills and Pedagogy

*As a routine and consistent part of their instructional planning, teachers provide the framework for appropriate application of technology at the classroom, unit, and day-to-day levels. Teachers are skilled at finding and utilizing the right technology tool for the learning task at-hand.*

*Technology is purposefully used by Mt. Vernon teachers to enhance and assess student learning. Lessons reflect standards appropriate to content and technology. Teachers model the effective use of technology within the instructional environment by communicating relevant information to students and parents using a variety of digital-age media and formats. Teachers are able to perform basic troubleshooting and quick fixes for common technological issues.*

*Teachers are mentors to, and instructional technology guides for, the school community of technology users. They model and offer instruction to students in the appropriate, skillful, and ethical use of technology.*

**Figure 5** shows data collected from teachers about the frequency with which they engage in various activities indicative of the NETS-T standards. These standards focus on teacher skills in using technology to inspire student creativity, facilitating student-centered learning, authentic assessment, personal (teacher) productivity and professional learning.

The data for teacher use of technology aligned with NETS-T is very similar to that reported for the previous indicator. This is particularly the case with NETS-T standards 1, 2 and 3 as these all involve having sufficient technology in the classroom (or at least the school) to conduct student activities. The only place where teachers indicate relatively frequent use is in NETS-T standard 3, personal productivity. This is teacher use of technology to create and read email, create worksheets, and other very basic personal uses. Since most teachers in the district do have a desktop computer (albeit a very old and unreliable one – see below), they are able to use that device for very simple professional productivity purposes. Nevertheless, teachers do note in their text comments and in focus groups that there are consistent problems accessing and using systems such as eSchool.



**Figure 5** – Teacher responses to survey question 3 on the frequency with which teachers utilize technology to support various NETS-T-mapped instructional strategies and professional activities. 4 = At least once a week; 3 = 2-3 times a month; 2 = several times a semester; 1 = several times a year; 0 = virtually never

The evaluators note that in many school districts a default teacher use of technology is the use of a Smartboard/interactive whiteboard (IWB). IWB use is typically very teacher-directed and hence does little to support true student-centered learning objectives, but it nonetheless is an entry point for teachers to use technology to support basic instruction. Unfortunately, there are very few IWBs in Mt. Vernon schools. They are rare to nonexistent in most elementary schools and not uniformly available in secondary schools. Subsequently, the majority of Mt. Vernon’s teachers are deprived of even this most basic technology to support their teaching practice. The data contains numerous teacher requests for access to IWBs in the classroom.

**Policies and Procedures Related to Technology**

*Each member of the Mount Vernon School District Community -- administrators, teachers, parents, and local leaders -- understands and shares a common vision of the practice of technology in education. This vision encompasses the equitable access to resources across grade level and content areas to support technology integration across the curriculum.*

*Teacher professional development is differentiated, and meets teachers “where they are” both in terms of addressing their unique skills-development needs as well as being job-embedded and available to teachers throughout the school day via mentors, coaches, and technology specialists. Teachers benefit from a clear set of expectations for student technology skills, mapped to the core academic curriculum.*

*The district’s fiscal planning incorporates monetary resources to support adequate building technology infrastructure, system maintenance, and professional development as it pertains to 21st century learning. Effective implementation of the district’s technology plan is an organic and adaptive process for which all stakeholders share responsibility as active advocates.*

This indicator focuses on three facets critical to what should be any district’s instructional technology program – vision, teacher professional development, and technology infrastructure and technical support.

The evaluators find that there is no district-produced “common vision” for instructional technology in the district. More to the point, there does not seem to be an intentional *district-produced* vision. Teachers and parents are quite clear on this point as shown in **Figures 6** and **7**, below.



**Figure 6** -- Teacher agreement with belief statements, survey questions 4h – 4k. 4 = Strongly Agree, 3 = Agree, 2 = Neutral, 1 = Disagree, 0 = Strongly Disagree



**Figure 7** -- Parent agreement with belief statements, survey questions 3h – 3j. 4 = Strongly Agree, 3 = Agree, 2 = Neutral, 1 = Disagree, 0 = Strongly Disagree

The evaluators note that while there is not any understanding (from teachers or parents) of a district vision, there is ample evidence that teachers have *their own* vision/beliefs related to technology’s value to teaching and learning. In fact, there is strong evidence that teachers have *independently* developed the roots of a sound vision for technology that aligns well with the indicators developed for this program review. For example:

*[Technology] can deepen understanding of concepts through various demonstrations, examples and hands-on learning experiences. Teachers would be able to have immediate access to internet games, etc. Classroom learning would have the potential of being more global, that is bringing worldly exposure to other cultures, geography, etc directly to students, broadening their prior knowledge and point of interest. Classes would be able to communicate with other classes making learning more fun and exciting.*

*Using technology will allow me to broaden my students background knowledge. It will also allow me to reach those learners that need to see it or touch it. It will bring life to my lessons and motivate the students to be more involved since my lessons will become more interactive.*

*I believe it would enhance instruction by the "hands on" activities it would create. The instruction would be more meaningful if they were actually were able to manipulate data.*

*The use of technology changes the role of the student in his learning. He/She becomes an active learner who makes choices how to obtain information. On the other hand, the teacher becomes a facilitator of learning who provides the guidelines, groups the students, and makes suggestions. The teacher is able to circulate around, ask questions, and make suggestions to the students.*

Therefore, while the district has provided no leadership or support in the development of a vision for technology’s role in teaching and learning, there is evidence that such a vision *could be* created. Once again, it is abundantly clear that Mt. Vernon’s teachers and parents are eager to implement technology and very much want to systemically improve the district’s schools.

In terms of professional development, the evaluators find that while there are various workshops held in schools throughout the year, teachers do not find that these sessions provide them with the skills necessary to implement technology in their classrooms. In addition to their general dissatisfaction with the actual sessions, teachers note that training and equipment/systems do not line up and that there is never enough time for follow-up to professional development sessions. Teachers consider existing professional development to be random and not well aligned with their actual needs or broader district objectives.

**Figure 8** shows survey data on where teachers say that they receive most of their professional development. Significantly, the greatest percentage of teachers list “other teachers” as their main professional development resource. In some districts this would be evidence of a healthy collaborative culture for professional learning among teachers. Unfortunately, in Mt. Vernon, this data indicates that teachers have to rely upon word-of-mouth information to figure out how to use the relatively few technologies that they have available. Still, most elementary principals note that their teachers do have common planning time, so there is potentially an opportunity for teachers to formally meet and collaborate around technology integration and the development of 21st century pedagogy.



**Figure 8** – Teacher identification of the various ways that they receive professional development.

Finally, the Policies and Procedures indicator addresses the district’s ability to fund, implement, and support technology infrastructure. As noted throughout this summary report, there is no evidence that Mt. Vernon has implemented a level of infrastructure – workstations, specifically -- that can support anything but the bare minimum of student and teacher use. True to the teacher comment noted in the opening quotes of this report, most computers in Mt. Vernon’s elementary schools are older than the students who use them. The evaluators observed relatively ancient computers in most buildings and in many cases broken equipment existed along side functional machines. In a number of elementary schools, teachers complain of computers that have been broken “for years” but remain physically locked onto classroom and lab tables. Teachers cannot remove these machines to free up the desk space. Teachers and administrators report that requests to the district’s technology department to resolve these matters have gone un-resolved. Teachers throughout the district routinely report that technical support is haphazard and unreliable. Some teachers specifically accuse technical support staff of “ignoring” their buildings. While the evaluators cannot independently verify these accusations, the fact is that there seems to be a significant lack of teacher trust in the district’s ability to support the technology infrastructure.

There is an obvious disparity in terms of technical infrastructure between elementary and secondary schools; and further, not all elementary schools are equal. At the secondary school level, the evaluators find Smartboards in a number of classrooms, and at least a few marginally functional computer labs. On the other hand, at the elementary level, most buildings do not even have standard dry erase boards, much less IWBs. Most elementary buildings (and some secondary schools) in Mt. Vernon still use chalk boards. At the most impoverished elementary schools in the district, there are chalk boards, many broken computers, and no peripheral devices such as computer projectors. A recent contest to award Smartboards to elementary schools has reportedly resulted in a many as four boards going into each elementary school. Nevertheless, these devices will not be installed until Summer 2013, so teachers and students have yet to benefit from this influx of equipment. Data shows that teachers will be very appreciative of the new Smartboards when they arrive.

Surprisingly (given the overall lack of technology infrastructure), there are WiFi access points in every building that broadcast at least two separate district networks. Mt. Vernon’s wireless network seems very widespread and at least theoretically available in nearly every classroom. Nevertheless, there are few if any wireless devices in the buildings and few teachers have the passwords necessary to access the WiFi (with their own personal devices). Several teachers were observed using their own personal laptops, but when asked they reported that they could not connect to the district network due to the lack of a password. The evaluators also observed that a number of teachers in various buildings have set up their own wireless hotspots (most likely using personal cellular data plans that they pay for out of their own pockets). These personal networks are used to provide access to personal devices such as smartphones and tablets. Several teachers note that this is the only way that they can provide their students with a functional Internet connection. The existence of WiFi but no wireless computers, and limited and obscure policies for accessing the district’s wireless network, just adds to the idiosyncratic and haphazard nature of Mt. Vernon’s technical infrastructure.

### Summary Recommendations

A useful framework for viewing the relative importance of the various components of Mt. Vernon’s technology integration initiative is the set of “Essential Conditions” developed by ISTE as a support for creating learning environments where national standards such as NETS standards can be reached. As shown below (**Figure 9**), these 14 conditions categorically address nearly every domain covered by the evaluators’ recommendations as well as the district’s indicators.

Further detail on these recommendations will be provided in **Chapter III** (Recommendations) of the full program review report.

#### 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*

The evaluators recommend that Mt. Vernon establish a clear and shared vision for instructional technology that is effectively aligned with the district’s mission and overall strategic plan.

Just as the vision needs to encompass multiple purposes and values for technology, it should be created by a broad representation of district stakeholders. In this way, it is essential to bring the community and top district leadership to the table for vision creation. This not only will bring in varied perspectives and ideas, but it will also result in a vision that has broad stakeholder support and is effectively shared with (and by) the entire community.

#### 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*

A shared vision is simply the cornerstone for a comprehensive, strategic, plan for instructional technology. Mt. Vernon needs such a plan.

The evaluators recommend that Mt. Vernon create a district-wide committee of stakeholders (teachers, administrators, parents, board members) and charge this committee with the creation of vision for instructional technology (see above) and then a clear, multi-year, plan for implementing the vision. This work should commence immediately as it is necessary independent of the schedule with which the district funds and builds its technology infrastructure. In fact, the district needs a plan to guide what is hoped to be a rapid and much-needed improvement to the infrastructure.

Like the vision, this plan should be shared broadly with the Mt. Vernon community.

#### Consistent and Adequate Funding

*Ongoing funding to support technology infrastructure, personnel, digital resources, and staff development*

It is clear that Mt. Vernon needs to commit considerable funds to the development of a functional technology infrastructure and the instructional and technical supports necessary for teachers and students to use that infrastructure. While the evaluators are not experts in just how the district should arrange such funding, its is clear that a plan for technology funding needs to be part of the shared vision and detailed, comprehensive, strategic plan for technology that the district must create.

#### Equitable Access

*Robust and reliable access to current and emerging technologies and digital resources, with connectivity for all students, teachers, staff, and school leaders*

At present, there is so little technology in use by Mt. Vernon’s students and teachers that it is difficult for most teachers (and parents) in the district to be specific about just what sorts of inequities exist in the district. No one has access to technology, so in a way there is equality in this overall inequitable situation. Still, the evaluators believe that the district likely has two basic inequities in technology that will become apparent as the district begins to make headway toward putting some amount of functional technology into the hands of teachers and students. These are inequities of physical access to devices and inequities in terms of exposure to technology-infused learning and technology skill development activities.

Inequity in terms of student in-school exposure to technology and the development of uniform technology skills should be addressed through the development of a K-12 technology skills scope and sequence and a mapping of technology-infused learning experiences to the district’s core academic curriculum (see “Curriculum Framework”, below). As regards the other type of inequity – that is, the lack of equitable access to technology devices -- the evaluators recommend that the district work toward what should ultimately be a 1:1 student/device ratio. While this ratio could be reached solely through the purchase of additional devices to be placed in schools, it is likely to be more cost-effective for the district to develop a policy that supports students bringing in their own, suitable, devices for personal educational use. Implementation of a so-called BYOT/D (“bring your own technology/device”) program will involve modifications in the district’s Acceptable Use Policy, the development of a technical “standard” for acceptable/suitable devices, and of course teacher training on how to manage a 1:1 classroom computing environment. For those students who do not have devices to bring to school, the district will need to develop a way of supporting those students either by supplying a school-owned for their personal use or arranging financial support for purchasing a device. This can be accomplished by providing high-need students with discounts/financial support to buy or lease such a device at a reduced rate (much as free-and-reduced lunch is handled at present).

Whether or not to develop a BYOT program -- and if so, what that program should look like -- should be the topic of a lively debate by the Mt. Vernon educational community. This sort of debate should be part of the district’s technology planning process.

#### Skilled Personnel

*Educators, support staff, and other leaders skilled in the selection and effective use of appropriate ICT resources*

Mt. Vernon needs to engage in work to improve teacher skills with regard to the integration of technology. Further, the district needs to find ways to increase the amount of instructional technology support provided to teachers via job-embedded professional development. This will require the hiring of instructional support staff in the district.

In terms of their instructional technology skills, Mt. Vernon teachers need to move beyond “adapting” existing pedagogies and into a place where they can design entirely new instructional environments that are supportive of district goals and initiatives. Teachers will require guidance from between six to 10 instructional technology specialists who can be embedded in each school (on a full or part-time basis) to tackle the work involved in designing and implementing these new environments.[[2]](#footnote-2) It is through this work with instructional technology specialists that Mt. Vernon teachers will realize success in pulling together various initiatives ranging from implementing the Common Core for Learning, to improving student performance on basic academic content. Ultimately, when teachers have been provided with the appropriate professional development, the district will need to establish clear expectations for teacher accountability around the effective use of technology for meeting student learning goals.

#### Ongoing Professional Learning

*Technology-related professional learning plans and opportunities with dedicated time to practice and share ideas*

As has been noted throughout this report, teacher professional development is critical to the implementation of Mt. Vernon’s instructional technology program. Teachers across the district need to expand their existing notions of what it means to integrate technology into instruction, and most importantly, need to understand the connection between student use of technology and the development of higher-order thinking and learning skills (21st century skills and/or NETS standards). This will involve a considerable escalation and focusing of Mt. Vernon’s existing teacher professional development efforts.

As noted in the “Skilled Personnel” section above, the district should expand its current instructional support staff to include Instructional Technology Specialists (ITS) at all grade levels (elementary, middle, and high school) and at all buildings. Best practice guidelines indicate that the district should have between six to 10 ITS total. These should be individuals who work in a mode reflected by the ISTE NETS-C standards.[[3]](#footnote-3) The primary function of the ITS is to push-in to classrooms and model effective technology integration practices for teachers. The Instructional Technology Specialists should be professional developers who focus on providing teachers with the skills necessary for effectively implementing the district’s technology skills curriculum mapping (see below).

In order to enable the ITS to effectively do their job-embedded work, the district should establish clear, district-wide, expectations for teacher professional learning around using technology to support core curriculum and 21st century learning. In other words, technology use to improve student outcomes should not be optional for Mt. Vernon teachers, and therefore neither should be participation in the professional learning designed to develop these skills. Mt. Vernon administrators need to lead their staff toward meeting these expectations. It is essential that staff understand that most professional learning around technology integration will be job-embedded and therefore take place during the school day. The district needs to support this type of job-embedded professional learning within the context of common team and/or grade level planning time for teachers.

#### Technical Support

*Consistent and reliable assistance for maintaining, renewing, and using ICT and digital learning resources.*

Mt. Vernon needs to change how it staffs and structures its technology department. The technology department should be overseen by the district’s curriculum and instruction supervisor. Such an organizational connection will ensure that technology decisions are always driven by curriculum.

It appears that the technology department is both under-staffed in terms of technicians and that it does not contain staff with the proper level of technical expertise to manage the enterprise network. Guidelines indicate that there should be one technician for each 400 connected devices in a district. This is a situation that must be addressed immediately and incrementally as the district begins to build a new technology infrastructure.[[4]](#footnote-4) The district cannot build a new infrastructure if it cannot support that infrastructure any better than the old, failed, infrastructure has been supported.

#### Curriculum Framework

*Content standards and related digital curriculum resources that are aligned with and support digital age learning and work*

Mt. Vernon should create a mapping of NETS-based student technology skills to the existing curriculum framework. This mapping should also include a scope-and-sequence of student technology skills by grade level so that teachers can be assured that their students will have the appropriate technology skills to engage in meaningful use of technology to meet core curriculum objectives.[[5]](#footnote-5)

#### Student-Centered Learning

*Planning, teaching, and assessment centered around the needs and abilities of students*

Through professional development and the K-12 curriculum “mapping” (see above) that the district should create, Mt. Vernon teachers will need to develop an understanding of student-centered learning. Such an understanding should emphasize the development of a learning environment where students take ownership over the learning process to individually or socially construct knowledge from a wide range of resources and learning interactions. This new emphasis would represent a significant shift from the teacher-directed learning environment prevalent across the district.

In practice, this shift involves the implementation of a project-based learning approach to mastery of higher order learning skills aligned with overarching curriculum objectives.[[6]](#footnote-6) Through this approach, Mt. Vernon’s teachers should serve as facilitators and guides to the learning process and not as directors of student activity. The evaluators believe that many Mt. Vernon teachers basically understand this student-centered approach to learning, but that they are unclear as to exactly how student technology use can support it. Developing this teacher knowledge of practice is a function of teacher professional development and instructional leadership that sets clear expectations for teacher knowledge and classroom practice. A key part of the new understandings that the district needs to create relates to the notion that “technology” is not separate subject from the teaching of core content knowledge and work toward meeting standards such as the Common Core for Learning. Teachers should not view technology as “taking away” time to improve their students’ academic achievement (e.g., test scores) but rather as a tool for developing the same student skills that will spell success in accountability data as well as lifelong learning. In order to achieve such a comprehensive understanding of technology’s role in student learning and achievement, Mt. Vernon’s teachers need a ubiquitous, well-supported, and reliable technology infrastructure.

In conclusion, the evaluators urge Mt. Vernon to undertake a systemic re-design of the district’s technology program. This re-design will ideally take place along the lines of the best-practice-informed recommendations contained in this program review report. Through such work, it is highly likely that the district will be able to meet the indicators laid out at the beginning of this program review work. Although this work will take considerable time, resources, and community support, the payoff is one that will allow *all* Mt. Vernon students to learn in an environment supportive of 21st century learning and life long success.

****

**Figure 9** – ISTE Essential Conditions

# II. Methodology and Conceptual Framework

This evaluation report is designed to serve several purposes for Mt. Vernon Public Schools. At its most basic level, the data herein exists as a record of the “current status” of instructional technology integration within the district. 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 Mt. Vernon. This discussion is a key part of framing the district’s use of instructional technology 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 life-long learning skills.

## Methodology

### Indicators and Data Collection

This program review presents data and findings related to how Mt. Vernon’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 three basic domains – Student Learning and 21st Century Skills, Teacher Skills and Pedagogy, and Policies and Procedures Related to Technology (including infrastructure). These domains frame the basic areas of investigation of Mt. Vernon’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.

Mt. Vernon’s evaluation indicators were developed with a committee of district stakeholders in February 2013. This meeting, follow-up discussions with district leaders, 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 and parent focus groups, and principal interviews in every building. The evaluators visited every classroom in each of the district’s 16 school buildings, and recorded observations in a large number of classrooms in each building. In addition to the in-person data collection, the evaluators also administered teacher and parent online surveys. **Figure 10** shows the *n* values for data collected.

|  |  |
| --- | --- |
| **Elementary**  |  |
| Observations | 44 |
| Teacher Survey Responses | 115 |
| Teachers in Focus Group | 5 |
| Parent Survey Responses | 28 |
| Parent Focus Group Participants  | 7 |
| **Middle School** |  |
| Observations | 9 |
| Teacher Survey Responses | 52 |
| Teacher Focus Group Participants | 5 |
| Parent Survey Responses | 5 |
| Parent Focus Group Participants | 1 |
| **High School** |  |
| Observations | 40 |
| Teacher Survey Responses | 42 |
| Teacher Focus Group Participants | 1 |
| Parent Survey Responses | 4 |
| Parent Focus Group Participants | 1 |
| **Other Staff, Principals and Administrators Interviewed** | 11 |

**Figure 10** – Table of data collected

## Conceptual Framework for Mt. Vernon’s Indicators

### The ISTE NETS Standards

Mt. Vernon’s technology evaluation has at its core a set of standards developed by the International Society for Technology in Education (ISTE) known as the National Education Technology Standards (NETS). Widely adopted in the United States, and increasingly recognized worldwide, the ISTE NETS integrate educational technology standards across all educational curricula and at all levels of the educational organization. At the classroom level, the NETS present a transformed view of teaching and learning with a unique set of standards outlined for students, teachers, and technology specialists. Additional standards exist for outlining the skills and knowledge that school administrators and other district leaders need in order to support the integrated use of technology and transform education in the way that the NETS-S (students) and NETS-T (teachers) describe.

The NETS-S standards are:[[7]](#footnote-7)

**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 Mt. Vernon’s evaluation is to determine the extent to which students participate in experiences that support NETS-S related learning outcomes, it is clear that teachers need to meet the NETS-T standards if they are to facilitate the type of learning reflected in NETS-S. Therefore, the evaluators examined teacher attitudes towards the use of technology to achieve particular types of student learning experiences.

The NETS-T standards are:[[8]](#footnote-8)

**1. Facilitate and Inspire Student Learning and Creativity**

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

**2. Design and Develop Digital Age Learning Experiences and Assessments**

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

**3. Model Digital Age Work and Learning**

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

**4. Promote and Model Digital Citizenship and Responsibility**

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

**5. Engage in Professional Growth and Leadership**

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

In the context of Mt. Vernon’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[[9]](#footnote-9)

ISTE NETS are clearly built upon current accepted standards of accomplished teaching and leadership.

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

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

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

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

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

These constructivist principles provide a context for the integration of technology to support learning in powerful ways. The following diagram (**Figure 11**), 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.

|  |  |  |
| --- | --- | --- |
| **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 11** – 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.

# III. Appendices

## Mt. Vernon’s Technology Program Review Indicators

***Student Learning and 21st Century Skills.***

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

**Indicator:**

Working in a technology-infused educational environment, Mt Vernon students create a variety of products, communicate and collaborate locally and globally, engage in authentic tasks, and investigate real world problems utilizing real and relevant data. Students take ownership over their learning and utilize technology to acquire and analyze information to fuel their research and thinking. Students have skills in evaluating data and information resources for their validity as well as in discerning which resources or technology would provide the most appropriate solution for completion of a task.

Students gather information to construct meaning, apply concepts, and present findings through a variety of vehicles. Students envision themselves as members of a global community while practicing safe, legal and responsible use of information and technology.

***Teacher Skills and Pedagogy***

***What skills – pedagogical and technical – do we want teachers to have to support the development of student skills and outcomes?***

**Indicator:**

As a routine and consistent part of their instructional planning, teachers provide the framework for appropriate application of technology at the classroom, unit, and day-to-day levels. Teachers are skilled at finding and utilizing the right technology tool for the learning task at-hand.

Technology is purposefully used by Mt. Vernon teachers to enhance and assess student learning. Lessons reflect standards appropriate to content and technology. Teachers model the effective use of technology within the instructional environment by communicating relevant information to students and parents using a variety of digital-age media and formats. Teachers are able to perform basic troubleshooting and quick fixes for common technological issues.

Teachers are mentors to, and instructional technology guides for, the school community of technology users. They model and offer instruction to students in the appropriate, skillful, and ethical use of technology.

***Policies and Procedures Related to Technology (including Infrastructure)***

***What should be the role of administrators and district policies in supporting teachers and students in leveraging technology to support in the development of the desired student outcomes?***

Indicator:

Each member of the Mount Vernon School District Community -- administrators, teachers, parents, and local leaders -- understands and shares a common vision of the practice of technology in education. This vision encompasses the equitable access to resources across grade level and content areas to support technology integration across the curriculum.

Teacher professional development is differentiated, and meets teachers “where they are” both in terms of addressing their unique skills-development needs as well as being job-embedded and available to teachers throughout the school day via mentors, coaches, and technology specialists. Teachers benefit from a clear set of expectations for student technology skills, mapped to the core academic curriculum.

The district’s fiscal planning incorporates monetary resources to support adequate building technology infrastructure, system maintenance, and professional development as it pertains to 21st century learning. Effective implementation of the district’s technology plan is an organic and adaptive process for which all stakeholders share responsibility as active advocates.

## Other NETS Standards

### 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.

1. 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
2. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision
3. 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.

1. Ensure instructional innovation focused on continuous improvement of digital-age learning
2. Model and promote the frequent and effective use of technology for learning
3. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners
4. Ensure effective practice in the study of technology and its infusion across the curriculum
5. 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.

1. Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration
2. Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology
3. Promote and model effective communication and collaboration among stakeholders using digital age tools
4. 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.

1. Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources
2. Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning
3. Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals
4. Establish and leverage strategic partnerships to support systemic improvement
5. 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.

1. Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners
2. Promote, model and establish policies for safe, legal, and ethical use of digital information and technology
3. Promote and model responsible social interactions related to the use of technology and information
4. 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 © 2009 International Society for Technology in Education. ISTE® is a registered trademark of the International Society for Technology in Education. iste.org.

### 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.

1. 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
2. Contribute to the planning, development, communication, implementation, and evaluation of technology-infused strategic plans at the district and school levels
3. 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
4. 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.

1. Coach teachers in and model design and implementation of technology-enhanced learning experiences addressing content standards and student technology standards
2. 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
3. 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
4. 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)
5. 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
6. Coach teachers in and model incorporation of research-based best practices in instructional design when planning technology-enhanced learning experiences
7. 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
8. 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.

1. 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
2. Maintain and manage a variety of digital tools and resources for teacher and student use in technology-rich learning environments
3. 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
4. Select, evaluate, and facilitate the use of adaptive and assistive technologies to support student learning
5. Troubleshoot basic software, hardware, and connectivity problems common in digital learning environments
6. 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
7. 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.

1. Conduct needs assessments to inform the content and delivery of technology-related professional learning programs that result in a positive impact on student learning
2. 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
3. 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.

* 1. Model and promote strategies for achieving equitable access to digital tools and resources and technology-related best practices for all students and teachers
	2. Model and facilitate safe, healthy, legal, and ethical uses of digital information and technologies
	3. 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.

* 1. 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
	2. 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
	3. 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

NETS·C © 2011 International Society for Technology in Education. ISTE® is a registered trademark of the International Society for Technology in Education. iste.org.

## 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)

## Data Collection Instruments

### Surveys

Teacher Survey - [http://www.sun-associates.com/mtvernon/ closed\_mvcsteacher.html](http://www.sun-associates.com/mtvernon/%20closed_mvcsteacher.html)

Parent Survey - <http://www.sun-associates.com/mtvernon/closed_mvcsparent.html>

### Principal Questions

This interview is part of Mt. Vernon’s review of how instructional technology is used to support teaching and learning in the district. Sun Associates has been tasked with conducting this review. In addition to my visit to your building today, we are conducting an online survey and will ultimately be visiting all classrooms in the district. We are also conducting teacher, student and parent focus groups. Ultimately, the results of this review – analyzed against a set of descriptive indicators developed by a team of district stakeholders (the principal should know this as all principals were involved in the indicator development) - will be reported to the district later in the spring.

You should know that 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.

**Principal’s Name and Background** (e.g., how long they’ve been principal, history in the district, anything they have to say about their personal philosophy, etc.)

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 does what you feel does an exemplary job of integrating technology as an aid in student learning?

Why, in your opinion, was this effective?

2. (*IF THEY HAVEN’T ANSWERED THIS IN THE PREVIOUS QUESTION…and if so, ask anyway so that they can summarize/recap*) Please give me an example of a **project/problem** (*this is different from just a “use” of technology…so push them for something more than the use of the* Smartboard) where you’ve seen a teacher integrate technology to support authentic tasks that the investigation of real world problems.

3. Could you articulate what you believe to be the district’s plan for technology integration? What are the key features (in your opinion) of this plan or vision (*prompt for “clear expectations” for teachers, students, and administrators)*

4. What challenges do your teachers face in integrating technology in your classroom? (this is the “barriers” question that usually elicits comments about infrastructure, support, etc.)

Specifically, how are basic trouble-shooting and “quick fixes” for technology problems handled in this building?

5. What opportunities do your teachers have to develop skills in integrating technology? (prompt for planning time, tech spec, PD)

6. Is there anything else that you would like me to know that has not come up in our conversation…or are there any other questions that you have for me?

### Teacher Focus Group Questions

This focus group is part of Mt. Vernon’s technology program review. The point of this review is to take a snapshot of how instructional technology is typically used to support teaching and learning in the district. Sun Associates, the organization I represent, has been tasked with conducting this evaluation. In addition to this focus group, we are running online surveys of teachers and parents and over the course of this month will be visiting all classrooms in the school. We are also interviewing principals and parents. Ultimately, all of this data will go – in aggregate - into a report that will be reviewed by the district later in the spring. What they’ll be doing is looking at this aggregate data against a set of descriptive indicators that a team of district stakeholders (teachers such as yourself, administrators, etc.) have created.

Your responses in this focus group will be confidential. Details of today’s conversation will not be reported to the district. We will never report any individual response in a way that attributes it to a specific person. 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 a learning activity from your classroom that helps students develop the 4Cs (communication, collaboration, critical thinking, creativity).

(*If they talk about technology, ask as a follow-up*) What value does the tech bring to the learning experience?

2. What does it mean to you for a student to “take ownership over their own learning”?

How does technology support a student “taking ownership”?

3. How skilled do you feel your students are at evaluating information resources online?

What would improve this?

4. To what extent do you believe that there are clear expectations in your school (or in the district) for how technology supports the core academic curriculum?

5. What’s your understanding of the district’s plan or vision for technology integration?

(*if this doesn’t come up naturally*) Is there anything that you could suggest that would improve the district’s ability to implement or articulate this plan?

6. What opportunities do you have to develop your technology skills and practices? (*we’re looking for info on how they use planning time, collaborate with other teachers, etc.*)

7. (*this has probably already come up, so just ask this question to get them to summarize*) What barriers exist to your ability to integrate technology in your classroom?

8. Is there anything else that you would like to tell me that has not yet come up in this discussion? Do you have any additional questions for me or anything that you want to be sure I get for the report?

### Parent Focus Group Questions

This focus group is part of Mt. Vernon’s technology program review. The point of this review is to take a snapshot of how instructional technology is typically used to support teaching and learning in the district. Sun Associates, the organization I represent, has been tasked with conducting this evaluation. In addition to this focus group, we will conduct an online survey and this month will be visiting all classrooms in the school. We are also interviewing principals and teachers. Ultimately, all of this data will go – in aggregate - into a report that will be reviewed by the district later in the spring. What they’ll be doing is looking at this aggregate data against a set of descriptive indicators created by a team of district stakeholders (teachers, administrators, etc.).

Your responses in this focus group will be confidential. Details of today’s conversation will not be reported to the district. We will never report any individual response in a way that attributes it to a specific person. 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. Describe how your student uses technology for schoolwork and homework (*that’s both IN SCHOOL and at home*). (probe for PROJECTS)

2. What’s your understanding of Mt. Vernon’s plan or vision for technology integration?

Is there anything that you could suggest to improve the district’s ability to implement or articulate this plan?

3. Do you feel that your student has developed (or is developing) the learning and technology skills that they will need after high school? What else would you like them to learn?

4. What does it mean to you for a student to “take ownership” over his/her learning?

5. Do you feel that your school does an adequate job of using technology to communicate information between school and home? How could this be improved?

6. Does your school have adequate technology resources to support your student’s learning needs? How could this be improved?

7. Is there anything else that you would like to tell me that we have not spoken of already in this discussion? Do you have anything else that you would like me to be sure to get into this report?

### Classroom Observation Protocol



1. See the Appendix for links to the online surveys used by the evaluators. **Figure 10** provides n values for survey data. [↑](#footnote-ref-1)
2. Guidelines such as the School Technology and Readiness charts recommend 0.5 FTE ITS for each 30 to 60 staff. [↑](#footnote-ref-2)
3. “C” is for “Coach”. A copy of this set of standards is found in the Appendix of this report [↑](#footnote-ref-3)
4. Specifically, technicians should be added and technical support should be scaled with the addition of workstations and other technology. [↑](#footnote-ref-4)
5. There are a number of models for such plans available. One is the ISTE NETS “Profiles for Technology Literate Students”, attached in the Appendix of this report and online at <http://www.iste.org/docs/pdfs/nets-s-2007-student-profiles-en.pdf?sfvrsn=4> . Another example is the “Classroom Scenarios” document developed by the State of Vermont. This document can be found online at <http://transformation-technology.wikispaces.com/> . [↑](#footnote-ref-5)
6. See Figure 11, in Chapter II for a side by side comparison of key features of traditional versus student-centered learning environments. [↑](#footnote-ref-6)
7. The full text of the NETS-S standards can be found online at <http://www.iste.org/standards/nets-for-students> . The complementary NETS-A standards are provided in the Appendix to this report. [↑](#footnote-ref-7)
8. The full text of the NETS-T standards can be found online at <http://www.iste.org/standards/nets-for-teachers> . [↑](#footnote-ref-8)
9. The following is excerpted from an ISTE publication and provides further detail and context for the student, teacher, and administrator NETS standards. [↑](#footnote-ref-9)