



EDUCATIONAL
COLLABORATORS

Technology Audit Report – May 2013

Western Boone County Community Schools

Educational Collaborators

Janet Herdman, Lead Collaborator

Steve Taffee

Angie Astuto

Jeffery L. Hunt

Table of Contents

Project Overview	3
Operations Review	5
General Software Use and Licensing	5
Software to Support the District.....	6
Classroom Software	6
Hardware	7
Support.....	9
Recommendations for Best Practices and Gaps in Practices.....	9
Network Infrastructure Review	11
Overview	11
Network Overview	11
Switch and Wireless Infrastructure	11
Network Management, Security, Routing Tools, and Disaster Recovery.....	13
Storage Area Network, Servers, and Backups	13
Internet and Security	14
Recommendations for Best Practices and Gaps in Practices.....	14
Academic Review	17
Overview	17
Instructional Equipment	18
Classroom Technologies in Use	19
Teacher Proficiency with Classroom Technologies.....	19
Outcomes Associated with Successful Technology Integration	19
Concerns about Technology	19
Recommendations for Best Practices and Gaps in Academic Practices.....	20
Professional Development Review	25
Overview	25
Current Professional Development	25
Setting Goals for Professional Development Focus.....	26
<i>Recommendations for Professional Development Focus:</i>	27
Professional Development Formats & Approaches.....	28
<i>Recommendations for Formats of Professional Development Sessions:</i>	30
Measurement & Accountability.....	31
<i>Recommendations for Measurement and Accountability:</i>	31
The Role of Administration in Professional Development	32
<i>Recommendations for Administration & Professional Development:</i>	32
Appendix 1 – Technology Survey Analysis: Principals, Teachers, Staff, and Parents....	33
Appendix 2 – Technology Survey Analysis: Student Data.....	65

Executive Summary

The Western Boone County Community Schools, hereinafter referred to as “WeBo” or “the District”, contracted with Educational Collaborators to conduct an external assessment of WeBo’s Technology Program relative to best practices for information technology in schools. Educational Collaborators collected background materials from WeBo through the use of a self-study tool and phone calls, a two-day on-site visit with focus groups and interviews, and surveyed district and building leaders, teaching staff, students, and parents. The results of the assessment will assist in the formation of goals and objectives for a three-year technology plan.

WeBo is a small rural school district located 45 minutes from Indianapolis. District staff, students, and parents were very complimentary of the district. They characterized the district as a tight-knit district where many professionals commute to cities for work. Individuals interviewed used labels such as safe, caring, and conservative when describing the district. The district leadership conveyed a uniform articulated vision and were very collaborative and welcoming. These attributes will serve the district well as they move forward with their initiatives.

Project Overview

Goals

- Provide external assessment of WeBo’s Technology Program relative to best practices;
- Uncover bottlenecks to current and continued success;
- Assess the district’s readiness to prepare students in 21st Century skills;
- Examine the current technology program's overall ability to facilitate sustainable innovation;
- Identify the concerns of various groups and individuals within the Western Boone County Community Schools Community;
- Create a common consensus of the goals being sought and the reasons for achieving them;
- Lay the foundation for a data driven technology plan and develop a longitudinal assessment strategy;
- Apply best practices to the plan within the context of the district’s unique culture and environment.

The findings in this report are organized into four broad categories:

Operations Review

- Overview
- General software use and licensing
- Hardware
- Support
- Recommendations for best practices and gaps in practices

Network Infrastructure Review

- Overview
- Network overview
- Switches and wireless infrastructure
- Review of servers and storage
- Network management, security, routing tools, and disaster recovery
- Storage area network, servers, and backups
- Internet and security
- Recommendations for best practices and gaps in practices

Academic Review

- Overview
- Instructional equipment
- Classroom technologies in use
- Teacher proficiency with classroom technologies
- Outcomes associated with successful technology integration
- Concerns about technology
- Recommendations for best practices and gaps in practices

Professional Development Review

- Overview
- Current professional development
- Setting goals for professional development focus
- Recommendations for professional development focus
- Professional development formats and approaches
- Measurement and accountability
- The role of administration in professional development

Operations Review

Technology systems in a school system support many online activities that include teaching and learning, communication, and the operation of the school district. Because schools support a large range of activities, smooth and consistent operation is essential to overall success. Technology systems in schools offer support unlike no other organization. Operations involve supporting learning activities in a Kindergarten classroom to detailed financial transactions in the business office.

Operations range from making sure educational systems and administrative systems are ready and available, data is updated for school decision makers, and communication systems keep the schools and larger community connected. This function can reduce redundant and manual processes while honoring licensing agreements and vendor agreements.

The ongoing support of technology is as important as the design and installation of the physical infrastructure. If systems are not maintained or users have to wait for support and installation, they lose confidence that they can dependably use the resources that have been made available. Users report that the IT staff provide great service and are dedicated to their schools. However the response to support requests is still not meeting needs for staff and students.

Summary Overview of Existing Structure

General Software Use and Licensing

WeBo utilizes Microsoft Enrollment for Education Solutions (EES) to ensure that their employees and students have access to the latest products from Microsoft and that the district is in compliance with the terms of their Microsoft license. However, the district has not yet maximized the use of all the product line available in the Enterprise licensing suite.

The self-study indicated that the district has no comprehensive system to track its educational software and other software titles and licenses that are installed on district computers. The Microsoft EES provides blanket licensing for all Microsoft titles, including those for email, client access licenses, Office and System Center Configuration Manager (SCCM). SCCM can assist in auditing titles that are installed on computer and provide remediation practices. The district is successfully replicating software across computers with SCCM. Deploy Studio is used to image the District's Apple fleet.

Software to Support the District

The large-scale enterprise systems that are supported include:

- Electronic mail (email): Employees use Exchange 2010. Students do not have district-supported email accounts.
- Human Resources/Finance: [Keystone](#) is locally hosted with no web-based components.
- Student Information System (SIS): [Harmony](#) is hosted locally with a web portal for staff and students.
- Library: [Destiny](#) is a web-based centralized library circulation system.
- Food Service: [Cafe Enterprise](#) is a point-of-sale (POS) system for cafeteria services.
- Transportation: [Transfinder](#) is a bus routing program for the district's transportation services.
- Learning Management System (LMS): [Moodle](#), [My Big Campus](#), and Harmony are in various stages of implementation and use. The self-study indicates a strong interest in moving LMS functions to My Big Campus.
- Video Distribution: [Mediacast](#) is a network-based, digital video storage and distribution system.
- Helpdesk ticketing: [Grouplink](#) is a help-desk system for employees to enter help tickets that are to be addressed by the technology department.
- Communication: [AlertNow](#): Rapid Communication System to notify employees and the greater community about important events related to the school district's operations and safety issues.

The district does not have a formal structure to share data between systems. The major challenge is linking the SIS to Active Directory. The lack of data sharing requires staff to intervene to move data or to create users one at a time, which is both time consuming and increases the possibility of data transcription errors.

Classroom Software

The district has [Acuity](#), [Accelerated Reader](#), [STAR Reading](#), [STAR Math](#), [DIBELS](#), [Study Island](#), [BrainPOP](#), [Grolier Online Encyclopedia](#), [Odysseyware](#) credit recovery, [SMART Notebook](#), [iTunes](#), [Type To Learn 4](#), [Read Out Loud](#), and many other titles used by specific teachers. Whenever possible the District uses web-based software. As noted above, the district does not have a system to track software that is installed on district computers.

Hardware

The district has the following computer inventory:

Windows	Operating System	Apple	Operating System
556 desktops	Windows XP	122 MacBooks	Mac OS 10.6/10.7
80 laptops	Windows XP	50 iMacs	Mac OS 10.6/10.7
64 netbooks	Windows XP	20 iPads	Not reported
		20 iPod Touches	Not reported
700 computers		212 computers	

The district has its technology distributed as follows:

Western Boone Junior High and High School

Technology for instruction and teacher use	Student technology
<ul style="list-style-type: none"> ● One teacher desktop computer in each classroom. ● One data projector in each classroom ● One Smart (Interactive White) Board in each classroom 	<ul style="list-style-type: none"> ● 2 -30 station computer labs for general use ● 2-30 station mobile computer labs ● 1-30 station computer lab for Business Education ● 1-28 station computer lab for Photography, Art & Business Education ● 1-25 station computer lab for credit recovery, testing and general use. ● 20 computers in the Media Center ● 13 computers in the Yearbook lab. ● 10 computers in the Radio/TV lab. ● 60 computers distributed across 5 science labs. ● 25 computers for Special Education ● 10 iPads for Special Education ● 10 iPads for Foreign Language classrooms.

Granville Wells Elementary School

Technology for instruction and teacher use	Student technology
<ul style="list-style-type: none"> ● One teacher desktop computer in each classroom. ● One data projector in each classroom ● One Smart (Interactive White) Board in each classroom 	<ul style="list-style-type: none"> ● One or two student computers in each classroom. ● 1-32 computer station lab ● 1-30 computer station netbook mobile lab. ● 1-20 unit iPod Touch cart

Thorntown Elementary School

Technology for instruction and teacher use	Student technology
<ul style="list-style-type: none"> ● One teacher desktop computer in each classroom. ● One data projector in each classroom ● One Smart (Interactive White) Board in each classroom 	<ul style="list-style-type: none"> ● One or two student computers in each classroom. ● 1-32 computer station lab ● 1-30 computer station netbook mobile lab. ● 1-20 unit iPod Touch cart ● 1-30 station MacBook cart

In addition the self-study indicated that there are 12 document cameras and 7 classroom response systems. Focus groups reported that there are not enough computers for the demand. Computer labs are frequently booked. At the elementary level, one group reported that students have one, 30-minute session each week. In both surveys ([Appendix 1, Question 5.1](#)) and interviews, teachers expressed a desire for additional student technology available in the classroom. Also from interviews and surveys ([Appendix 1, Question 8](#)) there is strong interest in staff being provided a district issued mobile device to be used at school and home.

Support

The technology department has four individuals: a director and three assistants, one at each school. The director straddles the technical side of the operation as well leading his own group, collaborating with curriculum personnel and providing professional development. Like many school districts, the department has technical staff members that have not been formally trained. Districts typically hire non-technical staff and then provide training and support for them. The director has a technology certification and provides direct technical assistance to the department members when they cannot resolve issues. He is responsible for all technology purchasing as well as updating web pages. The Director of Technology makes use of contracted support for technical assistance and is highly collaborative with the instructional leaders in the district. He and the Director of Curriculum have been meeting with the district technology vision committee.

Focus groups praised the technical staff. The department meets approximately bi-monthly with the director setting the agenda. Like every other technology department in school districts, the staff is met with important issues of time and prioritizing projects. In schools every time the bell rings or students shift into a new learning pattern, employees report technical issues.

The department reported that they have a web based help desk ticketing system that they have not had a lot of success implementing. Email is the primary way “work orders” are reported. They are not tied to inventory. They use Microsoft's System Center Configuration Manager (SCCM) for remote management.

Recommendations for Best Practices and Gaps in Practices

- 1 Consider using cloud services, such as Google Apps for Education or Microsoft 365, for word processing, spreadsheets, presentations and the like. Free or nearly free cloud services can reduce the internal server load and allow for easy access to all files for students and employees. As part of this review, the district should consider the current EES licensing to discern whether it is necessary in the future. As a policy point, it will be necessary for the district to decide the files that need to be kept internally and those that are stored “in the cloud.” Such decisions are targeted at personnel issues, financial records, and sensitive student records, such as Individual Education Plans. Further cloud services could standardize teacher websites. District provided student email accounts should be prioritized. Staff and students should have easy remote access to files.
- 2 Develop a list of functions and features for the final selection of a learning management system. While My Big Campus is the preferred LMS, the district should make an appropriate choice through a formalized process. Once selected, and implementation plan should be incorporated within the district professional development process.
- 3 Explore systems that automate processes, such as creating new users, and moving data between systems. This can be a system that is built for the district or one that is purchased.

- 4 Develop software and hardware inventories. Databases can be built, but with the demand, simple spreadsheets will handle this task. Make it a priority.
- 5 Included in the EES licensing is the licensing for Microsoft Lync. If the district continues with EES licensing, consider the implementation of Lync for staff collaboration and IT desktop support. The tool would add functionality for district and IT staff that is currently not provided in the district.
- 6 Executive administration and school administration must insist that employees use the online help desk software. Without the ability for the director to formally report the workload, it is impossible for supervisors to have a clear picture about the successes and needs of the department, and how workload affects teaching and learning. Technology purchases must align with curricular activities. When curricular design expands technology requirements, they can be addressed through appropriate purchases.
- 7 The district needs to improve support ratios for IT. With hardware to staff ratio approaching 400, response for help will be slow. The response slowness will cause teachers to abandon teaching and learning with hardware and software if it is inoperable for long periods. In the short-term approaching retirees with technical backgrounds or developing student assistants may help this. This group can help level 1 troubleshooting issues.
- 8 Invest, when necessary, in contracted services to catch up with support, or adding network services and integration services.
- 9 Develop a training program with budget for the technology staff to support the new tools and hardware. Incorporate training with vendor contracted services installation and other face-to-face and online trainings. Personnel require the skills to support the ever changing IT landscape.
- 10 Consider cloud-based solutions versus locally-hosted software to alleviate the need for additional personnel support and improved services.
- 11 The director should participate in his larger professional technical community whether informally, conferences, or formal learning.
- 12 The district needs to “build the bench” for technology professional development. The director has many obligations, opportunities, and challenges. Motivated teachers can be compensated with stipends and other incentives to become leaders to allow the Director to oversee the process but not be the sole driving force. Further all non-technical responsibilities should be removed from the department, such as updating web pages.
- 13 The department should meet more frequently. This is a time for formal and informal professional development of the staff. Individuals who receive formal training can use these sessions to teach others in the group. The assistants can help set the agendas for these sessions and make this a learning time for their work.

Network Infrastructure Review

Overview

Emphasis on technology to support student learning will undoubtedly require the institution to re-evaluate its current IT infrastructure to be sure it can handle the incremental load that will be placed on it. Teachers will quickly become disenchanted with the program if the equipment and network are not reliable. This presents unique challenges to school IT staff, such as demands on equipment repair, server maintenance, infrastructure and wireless capacity, data security, and storage capacity.

Beyond building an infrastructure for today's use, WeBo needs to look ahead and build for tomorrow's use. There is an increasing need to provide mobility and for resources that are, and will continue to be, increasingly cloud-based and more reliant on consumer devices. The district has built a secure infrastructure that provides flexibility in device selection and support. Management tools need to be considered that will provide for the ever-changing environment. It is recommended the district over-plan and over-build capacity today to support the increasing demands of the future.

In surveys with district staff [Appendix 1, Question 11](#) teachers indicate some concern toward the network reliability. In addition, this data illustrates that teachers are more significantly concerned about network reliability (3.7) and the speed of the Internet (3.6) as they consider the integration of technology at their school. They also convey some concern (3.7) regarding loss of instructional time because of technical issues. This could be as a result of the network or concerns regarding support. They also commented about restrictive policies and poor technology performance, and the need for greater remote access to business systems.

Network Overview

Switch and Wireless Infrastructure

WeBo is comprised of three school buildings, an administration building, and a transportation garage. Western Boone High School is the center of the network. The two elementary schools connect to the high school via licensed microwave wireless (200 Mbps, 100 Mbps transmit and 100 Mbps receive). The two schools have freestanding towers next to the buildings for their wireless dishes and the high school has a tower on the building holding dishes to the elementary and administrative buildings. The administrative building connects to the high school via an unlicensed¹ wireless (45 Mbps) and has a small tower next to the building. The transportation building connects to WBHS via licensed microwave (100 Mbps). The district does experience outage and connectivity problems during severe weather. The district has explored fiber

¹ The **Unlicensed National Information Infrastructure (U-NII)** radio band is part of the radio frequency spectrum used by IEEE-802.11a devices and by many wireless ISPs. It operates over four ranges.

connectivity between the schools. Each of the three schools has a different local Telco, which has made connectivity difficult.

Both elementary schools have an MDF and an IDF² and the high school has 5 IDFs. All IDFs are connected via fiber with 1 Gig uplinks. The IDF and MDF have unmonitored UPS protection. Cat 6a cabling is used in all buildings. In the high school they have a teacher drop and 5 additional drops (3 drops 2 locations and 2 in ceiling). At the elementary schools the cabling is 8 drops per classroom with 2 in the ceiling.

WeBo has standardized in the use of Cisco switches throughout the entire network. The high school has Cisco Catalyst stackable WS-2960S POE switches with 1 Gbps access to the desktop. Each stack in the IDF closets has its own 1Gbps connection to the MDF. The elementary have Cisco Catalyst stackable WS-3750 switches with 100 Mbps connection to the desktop. Each stack in the IDF closets has its own 1Gbps connection to the MDF.

The district also utilizes Cisco for its wireless networks in all three schools. Each school has its own WLAN Controller. The two elementary each have approximately 25 Cisco 1142 A/G access points. The high school has approximately 30 Cisco 1142 A/G access points and 30 3602 A/B/G access points. They have approximately one access point for every one to two classrooms. They have used the high-density access points (100+ clients) in the academic areas at the high school. Guest wireless has been established at all three schools but it is not available during the school day at the high school.

The phone system is comprised of two Cisco Call Managers, one Unity Server, one Active Directory Server, and one Exchange server for the phone system. Currently, the phone system is not integrated with email or main Active Directory. They have VoIP phones in every classroom. The phones are tied to the building intercom.

² The Main Distribution Frame (MDF) houses the electronics and cabling terminations for the network. The Intermediate Distribution Frame, or IDF, is a wiring rack located between the MDF and end users.

Network Management, Security, Routing Tools, and Disaster Recovery

WeBo currently does not use software to monitor switches, servers, computers, or access points. They do not make use of Smartnet³ for switches but they do use the warranty for wireless Local Area Network (LAN) controllers and unity software assurance. They do stock extra switches of all brands.

The following tools are used by IS staff.

- Anti-virus. [Lightspeed Security Agent](#) is currently used but the district is moving over to Windows Security Essentials. They also have [Kaspersky AV](#) running on some of the servers.
- Firewall. They make use of a software-based firewall called [Smoothwall](#). It is simple but effective. It runs on an old Dell Optiplex GX270 with dual Network Interface Cards (NICs) and is in need of an upgrade.
- Content Filter. Lightspeed's Total Traffic Control runs the content filter and does have a security agent and a user agent.
- O/S Updates. Software updates are pushed out via SCCM.
- Assignment of admin rights. They use Group Policy Manager on our Domain Controllers to distribute policies.
- Appropriate VLAN design has been established to segregate traffic between buildings, devices, and protocols.
- The district Uninterruptable Power Supply (UPS) would last 30 minutes and are setup for all MDF. They are not monitored.
- The district does not have a written disaster recovery plan.
- There is no documentation of network uptime.

Storage Area Network, Servers, and Backups

WeBo has a combination of Dell and HP servers. The current standard is HP servers. They have three HP host servers for 23 virtual servers. They make use of [Citrix XenServer](#) as the virtualization platform. They have 31 physical servers, which includes 13 servers for video distribution (Mediacast) and five for video surveillance. The district feels like they have virtualized most of what is available. They do not use anything to document uptime for server-based services. Over the last three months, they have had one hour of downtime during the school day. When they have lengthy power outages, they have issues getting services up and running again. (They power outage may damage a server power supply or corrupt the Citrix host). They also have some thin clients using NetApp.

WeBo has an HP/Lefthand Internet Small Computer Interface (iSCSI) two-node Storage Area Network (SAN). Both nodes are located at the high school due to WAN limitations. The SANs are on different ends of the building and are redundant. They currently use a [Unitrends](#) Recovery

³ Smartnet is Cisco's extended warranty program.

812 device for backups. Backup to disk is an appliance and has been very reliable. They do bare metal backups weekly and nightly backups for data. A weekly archive of an entire backup is put on a hard drive and taken to the fireproof safe at the Administration building. They have four weeks of archive data off site. They have about four months of retention on backups because they use an “incremental forever” backup. The nightly incremental backups begin at midnight and are typically finished in under an hour. Staff and HS students have “H” drive and elementary students have a generic login with drive storage in a shared folder. No storage limits are in place. Staff can get to the files remotely. Students are not setup yet to provide this option.

Internet and Security

According to interviews and survey results ([Appendix 1, Question 11](#)) teachers in Western Boone are concerned about the speed of the Internet. Under the state contract, the district uses ENA for Internet access. They have 30 Mbps via fiber egress that comes into the high school. They do not require a local client or a proxy to connect. Typical use is 12 Mbps and they peak at about 24 Mbps. They use Total Traffic Control by Lightspeed systems for Internet filtering. Question 11 conveys that principals and staff (4.4) have concerns regarding student Internet safety. The Administrative team decides filtering philosophy, while the Director of Technology typically implements filtering technologies. The District blocks adult content but not audio/video content. They block Facebook but allow YouTube. They block student access to email.

Recommendations for Best Practices and Gaps in Practices

1. E-Rate
 - a. Explore the use of E-Rate to support dark fiber connections between buildings. The current Wireless Local Area Network (WLAN) connections experience reliability problems during severe weather. The building users are completely dependent on this connection for all services. A reliable connection is imperative.
2. Switches and Phones
 - a. The district is commended for providing unified manufacturer connections for the switch, wireless, and phone services. This prevents finger pointing and simplifies installations and support.
 - b. To support future classroom applications in the schools it is recommended that the district review network switches to support 1 GB connectivity to the desktop and wireless access points. The district should also consider supporting 10 GB uplinks to the core. This will ensure there is plenty of bandwidth to support potential BYOD or 1:1 traffic.
 - c. Plan and budget for ongoing infrastructure upgrades. The infrastructure provides the backbone for the user experience and cannot be considered as a one-time expenditure.

- d. Integrate the phone system with Active Directory and email if staff stay on Exchange to streamline setup and provide unified communication functionality.
- 3. Wireless technology. The wireless system is serving the district's current needs. However, a higher density wireless system will be required with a 1:1 or BYOD program. The following recommendations should be considered as part of the solution.
 - a. Implement 802.11n Access Points to support a high-density education environment.
 - b. Implement Access Points that support 450 Mbps 802.11n (three spatial streams).
 - c. Continue to implement Access Points that identify interference and make changes accordingly.
 - d. Implement Wireless LAN Controller that maximizes 802.11n and the first phase of [802.11ac](#) when available.
 - e. Plan for load balancing across Access Points in areas of High Density such as testing or centralized congregation areas (i.e. cafeterias, gymnasiums, theaters, boardrooms).
 - f. Implement management software that will provide visibility into the wired and wireless network to gain visibility and help with root cause troubleshooting.
- 4. Mobility Device Management solution that provides on-boarding, authentication, profiling and posturing with remediation should be used in the district.
 - a. New wireless standards will be released in 2013. The district should consider the most current standards when upgrading including Gigabit wireless.
- 5. Servers and SAN
 - a. The district is in a good position with their server virtualization. Most districts strive for over 80% of the servers virtualized.
 - b. As the district reviews options for server replacement, review costs and benefits of cloud options. A hybrid cloud/in-house solution may be desirable.
- 6. Backups
 - a. It is recommended that the District research offsite replication for their backups. This is critical for enterprise applications such as the student information system and email. Options for Cloud backups should be investigated and compared with costs and benefits.
 - b. Test backups monthly. For any SQL databases or very critical data, setup a backup plan that will backup that content every few hours.
 - c. In addition to data backups, make a backup copy of the switch configurations and store it in the administrative fireplace safe.
- 7. System Monitoring, Remote Management, and Deployment Tools
 - a. WeBo needs to ensure that all servers and switches are actively monitored. Ensure monitoring configurations are installed on systems. Network and server monitoring will decrease downtime of network and increase productivity. Monitoring can also provide trends to help you plan future growth needs. [SolarWinds](#) is a recommended solution for system monitoring. Monitoring systems provide proactive systems support for user reliability.
 - b. Implement tools such as Microsoft's System Center Operations Monitor (SCOM) to monitor servers and applications.
 - c. Establish and document procedures for server updates.

- d. If the district maintains EES licensing, they should consider the use of Microsoft Lync for desktop remote management.
 - e. The management tool suite should also have the ability to monitor systems and user based tracking of Internet and mobile management to monitor devices on the network.
 - f. A mobile device management (MDM) tool should be introduced to simplify application deployment, on-boarding, selective wipe, data loss prevention, etc. for mobile devices.
8. Internet and Security
- a. A campus that uses technology strongly should have at least 150-200MB of Internet per 500-750 devices. Sluggish Internet connections in the classroom can create a negative attitude towards the technology. Teachers must be able to rely on the technology daily.
 - b. Establish a routine for periodic checks of Internet use to proactively keep bandwidth at optimum levels for users. Monitor and upgrade Internet usage in the future. To accommodate utilization spikes, normal utilization should not exceed 70% of capacity. Annual planning for bandwidth should also take into consideration anticipated new Internet programming and resources.
 - c. If possible add a secondary Internet connection via local cable company to provide redundancy. Install a firewall/router that can load balance these multi-connections. [Meraki](#), recently purchased by Cisco, makes one of the best router/firewalls on the market.
 - d. Further investigate Internet filtering configurations to ensure settings are defined to meet educational expectations: proxy and cache settings are maximized for efficiency, and tracking tools are in place. Content filtering should be decisions should be established at the instructional administration level and enforced at the IS level.
9. Disaster Recovery
- a. Monitor UPS at the building level to protect server uptime.
 - b. Address facilities issues around fire suppression and generators immediately or choose other facilities that have these capabilities. Consider these costs against other solutions such as offsite Data Centers or cloud providers.
 - c. Add configuration backups to the current fireproof vault solution.
 - d. Fully document all in-house written apps to ensure support and maintenance are available in the absence of developers.
 - e. Create a run book of step-by-step instructions to recover business critical applications in the event of disaster. The Run Book is to define recovery steps by application group with a focus on minimizing data loss and downtime due to system failures or network interruption or total site disaster at the primary data center facility.
 - f. Perform recovery tests on “non production” data sets to demonstrate and validate the procedures for recovering each application group listed above.

Academic Review

Overview

Establishing a clear connection between the curriculum development process and technology integration needs requires district leadership to reach consensus about the role technology plays in learning. They must make a corresponding commitment that translates theory into action in order to juggle dynamic, multiple priorities each year. International Society for Technology in Education (ISTE) supports such planning:

The integration of technology should serve to guide, expand and enhance learning objectives. It is understood that teachers and students do need to spend time learning the basics of using a computer. This is necessary in order to move to effectively integrating technology. Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions, as accessible as all other classroom tools. (ISTE, page 6)

Effectively integrating curriculum with technology is one of the most important components of a successful technology program. Survey data reveal that WeBo teachers, principals, and parents believe that technology integration could have very positive impacts on students. They identified several areas which they ranked highly as outcomes associated with successful technology integration ([Appendix 1, Question 10](#)), including:

- Better preparation for college and careers
- More opportunities for creative expression
- Improved academic achievement
- Lifelong learning
- Greater organization
- Higher student engagement in class assignments

Principals, teachers, and parents likewise agree on several areas of concern ([Appendix 1, Question 11](#)) regarding technology. (It is noteworthy that these items are all somewhat “fear based.”)

- Inappropriate Internet materials
- Cyberbullying
- Student Internet safety

Principals and teachers also share several additional concerns in areas where parents were not polled. ([Appendix 1, Question 11](#)). These items are resource based.

- Adequate funding
- Availability of professional development
- Time to learn technology

Most of the teachers and principals have high-speed Internet connections, smart phones, and access to e-readers and tablets that they use on a regular basis.

- 90.5% of teachers and 85.7% of the principals have a high-speed Internet connection at home. ([Appendix 1, Question 3](#))
- 71.4% of teachers and 100% of the Principals responded that they have a smartphone and they use it on a regular basis. ([Appendix 1, Question 4](#))
- 43% of teachers and 100% principals responded that they use Tablets on a regular basis. ([Appendix 1, Question 4](#))
- Perception of the level of access that teachers currently have to technology for learning at while at school is high, >4 on 5 point scale, but diminishes for student access ≤ 4 ([Appendix 1, Question 5.1](#))

These data suggest that adult access to technology is high, both at home and at school. However, access to the *right* technology, i.e. the same technology that the school may ask students to use in the future may be a different story.

Instructional Equipment

Most district classrooms equipped with basic technology tools. School buildings use a combination of fixed and mobile computer labs. (See [Hardware section](#), above, for details).

How do existing assets compare to what principals, teachers, and parents express as desired devices for student academic use? The data suggests an overabundance of desktop computers compared with their lighter, transportable counterparts: laptops, netbooks, and tablets. ([Appendix 1, Question 6.1](#))

The data further suggests that the ratio of devices to students (see table below) is far from the desired levels (see [Appendix 1, Question 7](#)). The majority of the equipment in the schools is located in the computer labs leaving very little equipment in the classrooms for every day student use.

School	Enrollment (2010-2011) ⁴	Total of Student Accessible Devices (labs, carts, etc.)	Current Ratio of Devices to Students
Junior High / High School	879	261	.29 devices per student
Granville Wells Elementary	513	82	.16 devices per student
Thorntown Elementary	432	112	.26 devices per student

⁴ Western Boone website ADM enrollment data.

Classroom Technologies in Use

Given the equipment and software that is in place in classrooms and labs, it is important to know how teachers and students are using it. The top rated uses of technology in the classroom as reported by teachers and principals are in the areas of:

- 1 Conducting research
- 2 Word processing
- 3 Presenting individual and group projects
- 4 Learning an essential skill
- 5 Drill and practice

There is a noticeable theme in these results. The first three all relate to the use of technology to support research in individual or small group contexts. In these cases students are exercising higher-level cognitive skills of analysis, synthesis and evaluation, while items 4 and 5 are oriented towards the lower levels of knowledge, comprehension, and application.

Keyboarding, a necessary but not sufficient condition for efficient word-processing, is provided a middling rating.

When one asks parents about how well WeBo is preparing their child(ren) in various areas of technology, high scores emerge for research, the Microsoft Office suite (presumably associated with research and word processing), and technology for communicating (presumably presentations, since there are few other communication tools for students).

Student reports are consistent with the reports of teachers, principals, and parents. Students report high use of technology in the areas of MS Office and Internet research.

Teacher Proficiency with Classroom Technologies

Given a certain set of hardware and software tools and then using them in the classroom does not necessarily mean that teachers are comfortable and proficient in using them. WeBo teachers report ([Appendix 1, Question 13](#)) greatest proficiency in the areas of:

- 1 Conducting Internet research
- 2 Sending group emails (presumably to colleagues as students do not have school email addresses)
- 3 Using interactive whiteboards

Outcomes Associated with Successful Technology Integration

Principals, teachers, and parents demonstrated a remarkable amount of consistency when asked about the outcomes associated with successful technology integration ([Appendix 1, Question 10](#)). All surveyed areas rated a 4 or higher.

Concerns about Technology

Principals, teachers, and parents also share concerns about increased use of technology ([Appendix 1, Question 11](#)). Taken as a whole, the data tends to cluster in several areas:

- Digital citizenship
- Resources
- Gaps in student technology skills
- Classroom management

Recommendations for Best Practices and Gaps in Academic Practices

Instructional Equipment

The instructional equipment in place in WeBo classrooms provides resources to support a rich, conventional technology program. LCD projectors and interactive whiteboards are often associated with teacher-centric models of instruction but can also be used by students to instruct one another. Labs and mobile labs can likewise be used as means of review and remediation, or they can be used for highly collaborative activities and creative expression. EC's experience is that it is only when the ratio of devices to students approaches 1-1 that transformative uses of technology emerge, uses that support higher order thinking skills, 21st century learning and teaching, and the technology required for college and career readiness.

Staff Tools. Teachers and administrators are very interested in mobile technology. It is important for future staff development and instructional direction for the district to provide laptops or tablet pc use for all teaching staff and administrators. Mobile technology will provide new opportunities for staff collaboration and in-service.

Teaching and Learning. The data ([Appendix 1, Question 6.1](#)) clearly suggests that the District should investigate some sort of 1-1 program. Cross-tabular analysis of survey data might reveal information about grade level and subject area interest and readiness, as well as the device(s) that could form the basis for pilot programs. EC recommends that teachers be seeded with portable devices one year in advance of widespread rollout for students.

Document Cameras, Lecture Capture, Student Response Systems. Additional computers for students are only part of the constellation of instructional equipment the District should consider. Putting aside normal replacement schedules for extant equipment (LCD projectors, SMARTBoards, teacher computers), the District should also consider wider use of document cameras and lecture-capture systems. Document cameras offer a wide range of in both conventional and innovative technology settings, and lecture capture systems are increasingly being used in "flipped" classroom settings in which teacher lectures are recorded, students watch the lectures outside of class, and classroom time is devoted less to lecture and more to discussion, differentiated instruction, and project based learning. Student response systems (SRS) can also be useful in the hands of teachers skilled in creating questions that probe student understanding. It should be noted that rather than purchasing stand-alone SRS systems, schools

can use laptop and tablet computers instead. Even handheld devices such as mobile phones⁵ can be used for SRS purposes.

Maker/Fab Labs. Finally, cutting edge schools are increasingly creating technology rich “maker” or fabrication (fab) labs, characterized by laser cutters, 3D printers, 3D modeling software, robots, vacuum forms, and materials such as wood, cardboard, metal, and plastic for creating objects. Literally hands-on learning occurs in all subject areas. Many schools use such labs to support cross-curricular projects. Teams of students are typically formed allowing students with different skills sets, some of which may not normally find expression in conventional classrooms, to make significant contributions to projects. Such labs can be geared for the entire K-12 spectrum.

⁵ The Pew Center for Internet Research [reported](#) (2010) that the most students are presented with their first cell phone at about age 12.

Classroom Technologies in Use

The instructional technologies used in WeBo classrooms fit well with the equipment currently in place, but do not maximize their full potential.

Migrate from MS Office to Online Documents. The highly utilized MS Office suite is not optimized for collaboration like cloud-based systems such as Google Apps for Education or Microsoft 365. Google Apps for Education have the advantage of lower cost, no licensing impediments for home use, and ease of data migration when employees and students leave the District.

FOSS. For more conventional users who like desktop applications, the District could investigate the use of Free and Open Source Software (FOSS) such as [LibreOffice](#) as a free alternative to MS Office, and Apple's Pages, Numbers, and Keynote as low-cost alternatives to MS Office. All of these programs read and write MS Office document formats. Many other FOSS alternatives exist as viable alternatives to expensive software suites and discrete academic applications (see [schoolforge.net](#)).

Social Media. The relatively low proficiency scores reported by principals and teachers in using these tools, not to mention other collaborative tools such as social bookmarking ([Diigo](#), [DeLiCiOus](#)), the school website, and Twitter suggest several areas for immediate exploration using current resources. EC recommends that initial uses for social media focus on internal communications and professional development uses, and as administrators and faculty become more comfortable and adept with the tools, consider expanding their use to parents and students.

Student Email. EC further recommends that students be rolled into the school's email system. 70% of students report that they are already using email at school, apparently using their own private accounts. Further, student report that increased access to technology devices would enable them to communicate more frequently with teachers outside of class, communication which EC believes would increase student learning and engagement.

Learning Management Systems. The school is to be commended for its initial forays into the learning management systems [Moodle](#) and [MyBigCampus](#). While there are arguments to be made on both sides of the issue regarding one or the other of these systems, or any of a host of other LMS systems⁶ available, EC recommends that the District initially standardize on one system, knowing that any one system will not fit all classroom needs. Choosing a system should incorporate multiple voices from the academic community, including students. The District should be wary of systems that use proprietary formats, and are complicated to import data to or to export data from. There is a likelihood that in the rapidly developing LMS marketplace that the District may, after a period of experimentation, find a different system that better meets their needs. It may also discover that one system may offer better features for younger learners while another is more adept at supporting secondary education.

Teacher Proficiency with Classroom Technologies

⁶ EC recommends that WeBo investigate [EdModo](#) as a potential solution.

Specific recommendations for increasing teacher proficiency with technology are addressed in the report section on Professional Development.

Successful Technology Integration

EC recommends that WeBo create a unified technology curriculum approach within its implementation of Indiana's adopted academic standards and local curriculum plans. Technology should be integrated with the warp and woof of the fabric of the overall curriculum. Even so-called special technology topics, such as computer programming, robotics, and digital photography can be introduced at the elementary school level, providing a conduit for students to explore such topics in more depth and with greater expertise in junior high and high school.

TPACK. Technological Pedagogical Content Knowledge ([TPACK](#)) offer frameworks for academic leaders and teachers to reference in creating an instructional technology integration plan.

Technology integration must be part of the curriculum development process rather than a "stand alone" or "strand." The TPACK model provides a vehicle for developing technology integration strategies as a natural part of curriculum development.

ISTE NETS Standards. The International Society for Technology in Education's (ISTE) [NETS](#) also provides additional frameworks for instructional technology planning with standards for administrators, teachers, students, technology coaches, and computer science educators.

EC recommends that WeBo:

- Charge instructional leaders with the responsibility of working with staff to examine their content area curriculum and pedagogy and identifying what technology is used and what 21st century skills are taught. Having staff tackle and "own" tech integration ensures that every faculty member has a place to invest in the work of moving tech integration and curriculum design to a higher, more transformative level. Departments should begin identifying potential opportunities where effective technology integration could accelerate learning.
- Align instructional resources and curriculum. In focus group and survey responses, staff indicated a concern regarding the amount of time it would take to find appropriate curriculum related technology resources.
- Map electronic resources to district curriculum. As the district begins to look at curriculum and resources related to the academic standards adopted by the Indiana Department of Education, this work will be both relevant and timely.
- Develop a process to collaborate across the district to capture effective teacher resources and update them regularly. This collection of documents should be available online, minimally within a shared server or cloud-based repository or more extensively within a LMS or curriculum mapping software.

Addressing Technology Concerns

Digital Citizenship. EC recommends that the district develop a Digital Citizenship charter and review existing curriculum to ensure that the activities support students and staff in developing and sustaining sound digital citizenship. In many schools librarians have a key role in developing

information literacy efforts, while school counselors and health personnel provide support in developing materials regarding cyber bullying and Internet safety. While IT needs to be a key player in these conversations, it is important the final policy decisions be made by academic leaders with IT providing the necessary technical and professional development to support those decisions.

In the area of “acceptable use policies” many schools are moving away from detailed lists of prohibited activities, which tend to become dates almost as soon as they are published, to “honorable use policies” which are broader in scope and spring from school honor programs, programs which have significant student input in their development. EC recommends that the WeBo develop digital citizenship guidelines for the educational community – guidelines for use of email and social technologies (social networks, blogs, IM, social media, etc.) and communicate these guidelines with all members of the community. Ideally, students must hear the same message from both the home and school.

WeBo may want to reference a range of resources that have already been developed to teach digital citizenship as they create and refine lessons and activities. EC recommends these sources:

- Online Safety - www.common sense media.org
- Cyberbullying - cyberbullying.us and www.cyberbullyingbook.com
- Copyright - www.teachingcopyright.org
- Balanced use of technology - rheingold.com/netsmart

Adequate Resources to Support Technology. Many people believe that when it comes to “resources” in schools one is ultimately talking about money. While money is often involved, it would be a mistake to think that it is the only solution. For example, when it comes to faculty time there’s a tendency to consider all new programs and initiatives to be additive in nature, i.e., piling more on teachers’ plates. Even with additional compensation for taking on purely additive approaches are ultimately unsustainable. EC recommends that as part of WeBo’s efforts at supporting technology it consider how technology can *reduce* teacher time spent on certain activities. This can be achieved through the more strategic and mindful use of existing technologies such as email (see [Send: Why People Email so Badly and How to Do It Better](#)⁷ to the use of new technologies such as learning management systems that can automate the distribution and collection of student assignments, testing, and can even provide basic feedback on written assignments.

EC would be naïve, however, to think that money does not play a critical role in addressing the technology issues in the district. Infrastructure, classroom technology, and professional development all require investment as does the physical plant, textbooks and other learning materials, and most of all employee compensation.

E-books hold promise for lowering textbook costs, but traditional publishers are loath to reduce their profit margins. Open textbook and other open content projects such as [CK-12](#), [Curriki](#), [Textbook Revolution](#), [Bookj](#), and numerous other projects may ultimately prove to disrupt current models of content provisioning in schools, but schools need to be realistic about how

⁷ <http://www.amazon.com/dp/030727599X>

much change they can take on at the same time. That said, the opportunity presented by adopting new academic standards that meet college and career readiness requirements opens up decisions about how to best support the curriculum, including use of textbooks and other materials.

Professional Development Review

Overview

Students currently in elementary school will most likely graduate high school in a world where digital content has, by and large, completely replaced print content. The combination of the adoption of new academic standards, coupled with increased prevalence of open content encourages educators to embrace these advances in technology and align improvement efforts with instruction at possible points of intersection to increase student learning.

The responses to the self study and focus groups indicate that WeBo leadership envisions technology use in the classroom to support district initiatives to improve student learning, which include literacy, effectively implementing a more rigorous set of academic standards as adopted by the Indiana Department of Education, a new assessment designed to measure college and career readiness, and using data to reflect upon and determine instructional strategies. Professional development must be designed to support faculty as they execute these initiatives with students each day. Key to successful professional development, especially with the use of technology in the classroom, is the understanding of how the needs of professional, adult learners differ from the needs of student learners and how to integrate the learning needs of faculty in various domains, including planning, instructional and assessment strategies, general professionalism, and technology skills.

Current Professional Development

To best prepare to meet the professional development needs of the faculty and staff, it is appropriate to review current professional development strategies and structures. Responses from WeBo's self study indicate that faculty and staff current receive support from building technicians. While they are not certified and do not offer specific curricular support, survey responses indicate that faculty and staff are satisfied with their current level of technology access ([Appendix 1, Question 5.2](#)). Individual comments written into the survey and given during focus groups reflect satisfaction with the level of "real-time" support they currently receive as well.

The self-study also indicated that there currently are no designated in-service days, meetings, or conferences scheduled specifically for technology professional development, though some internal sessions have been offered to support faculty in the use of SMART Boards. Additionally, professional development related to technology has not been scheduled into faculty, grade-level or department meetings. Further, while faculty could choose to incorporate the use of technology into their professional growth plans, they have not been specifically encouraged or required to do so.

Responses written into the survey, along with responses given during focus groups, suggest that faculty feel strongly the desire for more time for training on particular technology tools and to design lessons integrating technology.

Also of note are the comments written into the survey responses that reveal a great mix of technical ability among faculty and a significant mix of philosophy regarding feelings toward technology in education. Part of a successful professional development program for WeBo must include change management and be considerate of these vastly disparate concerns.

Best practices in technology professional development should include a consideration of a number of different things: focus and goal-setting for professional development, types and formats of professional development, leadership in professional development, and measurement and accountability.

Setting Goals for Professional Development Focus

Results from the baseline data gathered from the survey, focus groups, and district self-study responses indicate that WeBo administration, faculty, parents, and students value the fundamental skills at the core of a 21st century learning experience. While initial survey data suggest that faculty and staff desire tool-specific training, it is important to understand that effective professional development for 21st century teaching and learning is not always tool specific. Rather, for successful, transformative, integration to occur, professional development should concept-based, focusing on 21st century pedagogy.

Considering both of these needs and the findings from the focus groups, self-study, and surveys, data suggest that initial topics and tools on which professional development should be focused include:

- **Change Management & Vision for 21st Century Teaching and Learning** - Regardless of the ultimate decisions regarding network, devices, and applications, successful technology integration in the 21st century classroom brings about a paradigm shift from traditional classroom models. As noted, the comments written into survey responses indicate a variety of responses to and readiness for such change among WeBo faculty. Faculty and staff will need a clear understanding of the vision and goals for technology in Western Boone and the integral role they will play in a shift to student-centered learning, including how that change integrates with other district initiatives.
- **Digital Citizenship** - While the survey data indicated that this was clearly a concern for parents, administrators and faculty, ([Appendix 1, Question 10](#)) student responses did not evidence great concern in this area. However, the results from [Appendix 2, Question 5](#) are a clear indication that adult guidance in technology use is necessary for WeBo students, and to this end, faculty need thorough training in and discussion of Digital Citizenship, along with the necessary curriculum development in this area discussed in the Academic section of this report.
- **Classroom Management** – Though not the top concern, noted among concerns with the use of technology in the classroom were such things as student distractibility and overall

classroom management ([Appendix 1, Question 11](#)). Also noted in the written comments was student Internet access at home and proper care of technology, both of which could also be considered under classroom management. With these concerns, it is important that faculty receive proper professional development and ongoing support with classroom management and technology.

- **Common Core & Technology** – With the anticipated transition to a more rigorous set of academic standards in preparation for newly aligned assessments to measure college and career readiness, an important point at which to integrate professional development initiatives will be with how technology can be used to support instruction with the new academic standard requirements. In this area in particular, different professional development by grade level or discipline could make it more effective, and a variety of formats and offerings exist in these areas.
- **Literacy & Technology** – WeBo’s literacy initiative has already provided an organic point for technology integration, especially with electronic AR tests. This could also be a natural point at which to introduce action research with technology to faculty, making them an integral part of data-driven planning. Based on the feedback in focus group and survey responses, it appears both students and teachers recognize the value of formative assessment in student learning. Using such tools as [Quia](#) and the [STAR tests](#), teachers could provide students immediate feedback on their progress in developing skills and understanding of key concepts, while arming themselves with the data necessary to plan effectively.
- **Specific Technologies and Applications** – Among the areas in which faculty and staff felt least proficient was in the use of Learning Management Systems. As the interactive tools available on LMS are valuable to developing the collaborative and communication skills central to 21st century learning, this would be a worthwhile focus for professional development offerings. This recommendation, coupled with the recommendation under the Academic section of this report that the district commit to a particular LMS, suggests a need for focus in this area. Other areas for potential professional development as indicated in [Appendix 1, Question 12.1](#) include the use of video resources and managing settings on digital devices.

Recommendations for Professional Development Focus:

- **Develop a specific, data-driven professional development plan that outlines relevant concept-based training, tool-based training, opportunities for collaboration, and measurement/assessment of teacher technology integration.** In light of the recommendations for the topics on which faculty and staff need training, the format preferences indicated in the survey responses, and the recommendations for measurement and accountability of technology integration, WeBo leadership should outline specific professional development plans for the coming year(s). Initially, the baseline data analyzed by EC in this report could serve to write the goals for such a plan, but the effectiveness of professional development should be measured regularly via such methods as surveys, classroom observations or [learning walks](#) (student assessment data), and the RISE teacher assessments to make revisions to the plan on at least an annual basis.

- **Allocate funding for the district’s professional development.** This funding should include budgeting for workshops, training sessions, conference attendance, money for technology support personnel or faculty to try new tools or applications, memberships for technology support personnel or faculty in professional organizations, and any tools that might be used in administering or documenting professional development (e.g. electronic portfolio tools).

Professional Development Formats & Approaches

In the survey responses, it was clear that hands-on learning was the preferred method for delivery of professional development among WeBo faculty and staff. ([Appendix 1, Question 14](#)) In the focus group responses, WeBo faculty expressed interest in the types of professional development that mirror those same types of 21st century instructional methods WeBo students crave in their learning. Those include

- “Real-life experience” and access to models and examples: WeBo faculty would like the opportunity to collaborate with other professionals, whether on campus with WeBo colleagues, in visits with other schools, or through collaboration at conferences or in online communities.
- Hands-on and practice: WeBo faculty expressed the desire for specific, focused training sessions with immediate application to their classroom practice, including such things as “make & take” sessions for technology training.
- Research opportunities – WeBo faculty were interested in the alignment of electronic resources to curriculum during the Common Core process and storing it in a curriculum repository. The collection of electronic resources would be a relevant tool should the IDOE choose to adopt a different set of academic standards as well.

Recognizing that one-size-fits-all professional development is not effective, it is important to consider a variety of professional development options and formats for WeBo faculty. Among the top concerns of school leadership and faculty with successful technology integration remains the time to develop the skills ([Appendix 1, Question 11](#)). For that reason, careful consideration of the most effective formats is essential. Included below are possible delivery formats, listed in order of preference from survey responses ([Appendix 1, Question 14](#)) along with some examples of approaches to these formats.

Preferred Formats	Possible Approaches
Hands-on sessions or interactive experiences	<ul style="list-style-type: none"> ● In-Service Workshops – Full or part-day faculty in-service workshops allow for time to integrate not only tool-specific training, but also broader conversations of instructional strategies for building 21st century skills and meeting student learning goals. A technology integration specialist or other on-staff trainer could facilitate these by an outside source or. ● Regular Training Sessions – Whether at scheduled faculty meetings, before or after-school sessions, or at regular times throughout the year, training should be offered regularly,

	<p>whether to bring faculty and staff up to speed on particular tools or applications, or to discuss philosophical approaches or instructional strategies. Again, a technology integration specialist or other on-staff trainer could facilitate these by an outside source or.</p> <ul style="list-style-type: none"> ● Conferences – Local and national conferences provide educators the opportunity to benefit from tool and concept-specific training, along with developing collaborative relationships with other educators. Identifying faculty leaders in technology integration (see “Train the Trainer” below) and sending them to conferences would allow them to bring such training and expertise back to WeBo faculty. ● Summer Institute - During interviews, the district digital visioning committee expressed a desire and willingness to conduct summer technology training for staff. Summer institutes emphasizing district tools and conducted by district staff can be a very powerful way to seed staff learning for the coming year. ● District LMS - As the district defines which LMS system will predominantly be used in the district, review ways in which the tool can be used as a collaboration and staff development for its adult learners. Staff use of the tool in their own learning will increase their use and understanding of its potential in the classroom.
<p>Small-group collaborative teams/discussions</p>	<ul style="list-style-type: none"> ● Grade-Level or Department Teams – Often already existing within a school’s organization, grade-level or department teaching teams can be sources of support and idea exchanges in effective classroom technology integration. When mentored by a technology integration specialist or other on-staff trainer, these groups could allow faculty to get necessary professional development within existing school structures. ● Professional Learning Communities (PLCs) – PLCs are small groups established around key areas of interest in instruction and curriculum. At times, these might focus on particular technological approaches or tools, and at other times, they might focus on instructional strategies or philosophies. Again, mentoring by a technology integration specialist or other on-staff trainer could facilitate valuable professional development in this format. ● Professional Learning Networks (PLNs) – While not centered on a particular school campus, Professional Learning Networks allow educators to leverage social media and online resources to connect with professional resources and

	<p>collaborators through which to develop knowledge and skills in instructional skills and technological tools. Good starting places for developing PLNs include ISTE Special Interest Groups (www.iste.org/connect/special-interest-groups) and Classroom 2.0 (www.classroom20.com).</p> <ul style="list-style-type: none"> ● Observations – Administrators, faculty, and staff could also gain valuable insight from observations of colleagues, both within the district and in neighboring schools and districts. ● Professional Organizations – Whether local or national, professional organizations allow administrators, faculty, and staff to benefit from shared knowledge and experience, enabling them to bring new ideas back to their district and schools.
Work with a technology integrationist	<ul style="list-style-type: none"> ● Position of a Technology Integration Specialist – The position of a staff member who is available on a full or part-time basis could be a valuable resource for WeBo faculty as they integrate technology in the classroom. Written comments from the faculty survey indicate some desire for help in identifying ways to apply specific technology tools to meaningful classroom instruction. ● “Train the Trainer” – Another option for schools in providing on-staff support for faculty is a “Train the Trainer” model in which key faculty members are identified to receive specialized training from workshops or conferences and share that expertise with their colleagues.

Worth noting is that among the least preferred methods of professional development formats were online learning and watching tutorials/videos. However, these kinds of formats did receive some response from faculty, principals, and staff, and should not be overlooked as future options for quick-access, data-based tutorials or references, especially for new faculty or those seeking certifications. Content for such training could be identified from sources such as TedTalks www.ted.com, the k12 Online Conference k12onlineconference.org, and Classroom 2.0 webinars www.classroom20.com.

Recommendations for Formats of Professional Development Sessions:

- **Commit to structured, reserved time for professional development related to technology.** The district should mandate time during the summer, before the school year begins, or during in-service days throughout the year for professional development related to specific technology applications or tools, along with major district-wide initiatives and instructional strategies to support 21st century teaching and learning. In addition, the district should identify other regularly occurring times that could be devoted to similar training, whether in faculty meetings, teaching team meetings or other meeting times before or after the school day.

- **Identify leaders on staff.** EC recommends that WeBo leadership identify faculty and staff within the schools who could serve as leaders among their colleagues, considering roles for them in pursuing formal training they could then share in small-group training or workshops, in facilitating teams of faculty and staff, or in mentoring other faculty and staff. These leaders could be identified as TPACK mentors (tpack.org), with a focus on integrating technology, pedagogy and content knowledge. New leaders should be identified annually, with existing leaders encouraged to refine their expertise and share that knowledge with the greater educational community via conferences or Personal Learning Networks (PLNs).
- **Provide for professional development for technical support staff.** Whether through conferences, PLNs, professional organizations, or other formats, it is important that technical support staff get the necessary training and professional support to develop their skills, which could differ from the needs of faculty and administrators. Training is available in various formats for different certifications. From online resources to training textbooks to university-affiliated courses, training can be found from a variety of sources to determine the particular needs of technical support staff. Membership in professional organizations or partnering with colleagues from other area districts is also essential to staying current on emerging technologies and trends. A good starting point for such connections would be ISTE Special Interest Groups, available with an ISTE membership. (www.iste.org/connect/special-interest-groups)

Measurement & Accountability

The success of any school initiative requires ongoing assessment and measurement of its effectiveness, and the integration of technology as a tool for student learning is no different. With the adoption of RISE, WeBo has already demonstrated a commitment to accountability and measurement of professional progress. WeBo's responses on its self-study, however, indicate that the use of technology as a tool to improve student learning has not previously been an integral part of such measurements.

Recommendations for Measurement and Accountability:

- **Administer a regular assessment of technology skills and integration for faculty.** Using the NETS for Teachers (www.iste.org/docs/pdfs/nets-t-standards.pdf?sfvrsn=2) or another appropriate measurement, EC recommends that WeBo measure the current technology skills of faculty and staff. This could serve two purposes: first, to establish baseline data of the overall comfort and proficiency of faculty and staff in using and integrating technology, and second, to provide ongoing, annual assessment of the progress of individuals and the district as a whole in their professional learning. Other bases for measurement the district should consider using both as guides for faculty and to assess the district's overall progress in technology integration include rubrics from the Arizona K12 Center (<http://azk12.org/tim/>) and from the University of South Florida (fcit.usf.edu/matrix/matrix.php), along with the skill maps available from the Partnership for 21st Century Skills (www.p21.org/tools-and-resources/educators)
- **Identify how technology can be used to foster professional progress in the RISE competencies.** As part of their annual professional growth plans related to the RISE competencies, WeBo should assist faculty in identifying how technology can be used to

assist them in meeting the RISE competencies, especially those directly related to instruction and student learning. Some particular areas of the RISE rubric worth reviewing for potential support with instructional technology include:

- 1.1 Utilize Assessment Data to Plan
 - 1.5 Track Data and Analyze Student Progress
 - 2.2 Demonstrate and Clearly Communicate Content Knowledge to Students
 - 2.3 Engage Students in Academic Content
 - 2.4 Check for Student Understanding
 - 2.6 Develop Higher Level of Understanding Through Rigorous Instruction and Work
 - 2.7 Maximize Instructional Time
 - 3.2 Collaborate with Peers
 - 3.3 Seek Professional Skills and Knowledge
 - 3.5 Engage Families in Student Learning
- **Establish basic expectations of technology integration for faculty.** While this may differ by grade level or even department, faculty should have a clear understanding of what is expected of them with regard to technology integration and how it relates to WeBo's vision and goals. Ideally, WeBo faculty could be included in the conversations establishing these expectations. At its best, these expectations could be connected with professional evaluations and RISE competencies. This would also need to include a method for ongoing measurement. (For example, if a minimum expectation is that faculty post assignments on a Moodle or MyBigCampus page, an administrator or designated staff member would need to monitor such an expectations and provide support or follow-up if that expectation is not being met.)

The Role of Administration in Professional Development

Successful professional development in technology integration requires active participation in the process. Administrators can and should participate along with faculty in technology training sessions. For administrative support to appear genuine, it is essential that administrators use the tools and model the technology they will be asking their faculty and students to use. Administrators should also review and assess their own technology skills. A good start for such an assessment would be ISTE's Nets for Administrators. And as encouraged with faculty, administrators should identify areas in which they need professional growth related to technology integration, including any training needed for assessment purposes. [Appendix 1, Question 12.1](#) indicated that some areas for growth that are particularly relevant to school leadership include analysis of data in decision making and the use of tools (such as spreadsheets) used for such analysis. Also ranking high among areas for growth were collaborative tools such as LMS and blogs.

Recommendations for Administration & Professional Development:

- **Model professional learning, accountability, and technology use.** EC recommends that administrators participate in a variety of professional development related to technology integration as well, including participating in WeBo training sessions, developing their own Professional Learning Networks (PLNs), participating in

collaborative discussions and learning with grade-level and/or department teams. A good place to begin to assess the technology skills of district leadership is with ISTE's Nets for Administrators.

- **Seek out necessary development opportunities in leadership and assessment of faculty.** Administrators would benefit from participating with faculty in training on the integration of technology with other district initiatives, including Common Core Standards (or other academic standards adopted by the Indiana Department of Education), student assessments, RISE Faculty Assessment, and Literacy. In addition, administrators should seek out professional support for leadership in these areas, both by collaborating with other WeBo administrators, and by developing PLNs among leaders from other schools, districts, and professional organizations.
- **Outline tools that will be used to measure comfort and skill with technology in the hiring of new faculty.** Once the vision and goals for WeBo's use of technology have been established, it will be important that this is considered in the hiring of new faculty. School administrators should have a common framework for measuring this in the hiring process, perhaps by including interview questions or portfolio requests related to technology integration and WeBo's vision.

Appendix 1 - Western Boone Technology Survey Analysis: Principals, Teachers, Staff, and Parents

1. Introduction

Based on the findings gathered during technology audits and focus groups, and with input from District Administrators, Educational Collaborator created an online survey was developed to gain insights about these findings from a larger population of the District's constituents. Key observations and recommendations from the survey are below.

Survey Plan

An online survey was developed and distributed to parents, faculty and administrators. The District Office communicated the information about the surveys to parents, faculty and administrators and requested participants take the surveys online. The survey was conducted between the dates of February 25, 2013 through March 13, 2013.

The major observations and recommendations developed from the analysis of the surveys are presented in the following sections.

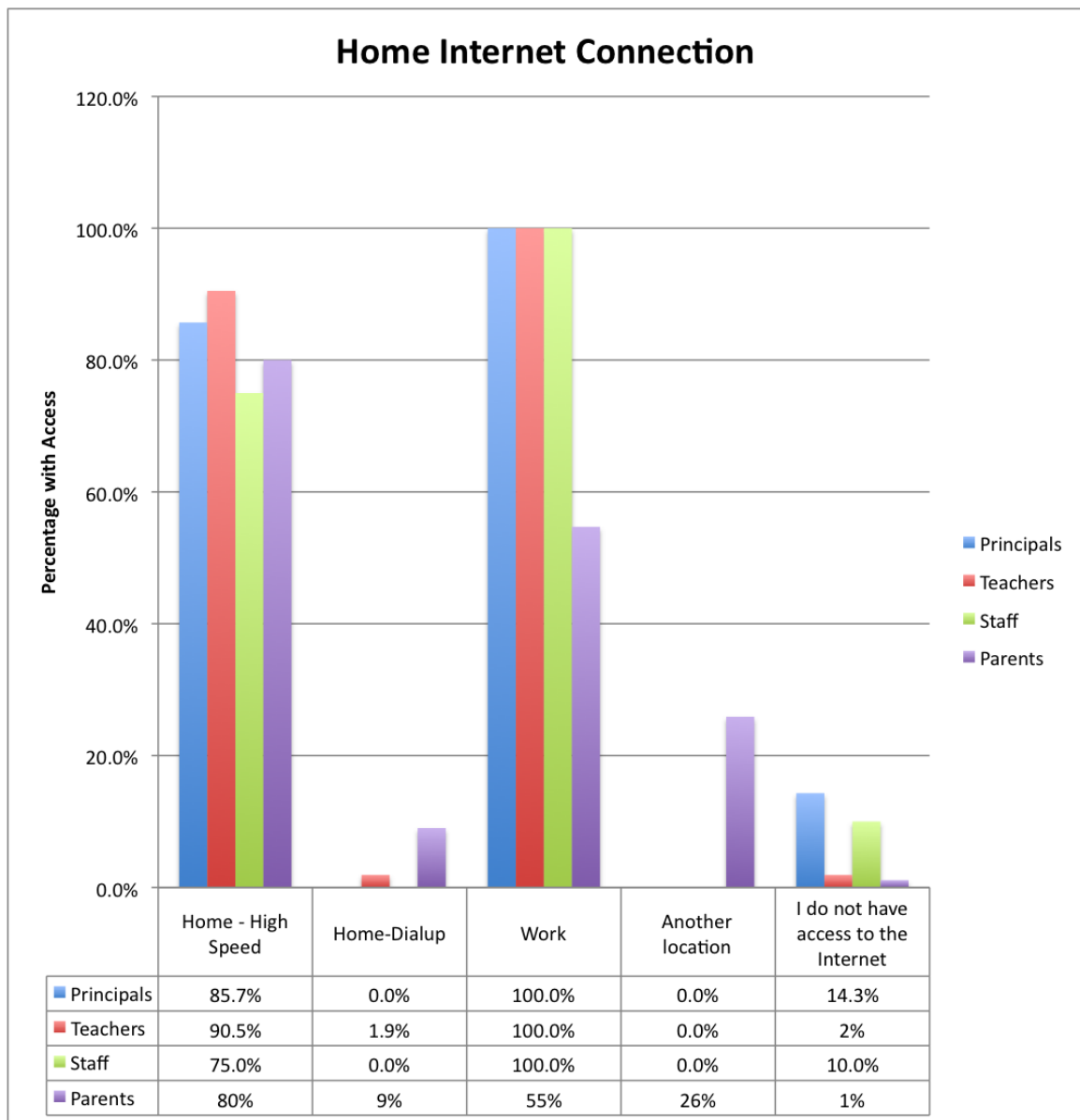
2. Survey Responses

The number of respondents that completed the survey was INSERT TOTAL RESPONDENTS HERE. The constituent breakdown is provided in the table below:

Group	Number of Respondents	Total Population	Response Rate
Principals	7	7	100%
Teachers	105	125	84%
District Staff	20	25	80%
Students	1030	1780	58%
Parents	468	1342	35%

3. Home Internet Connection

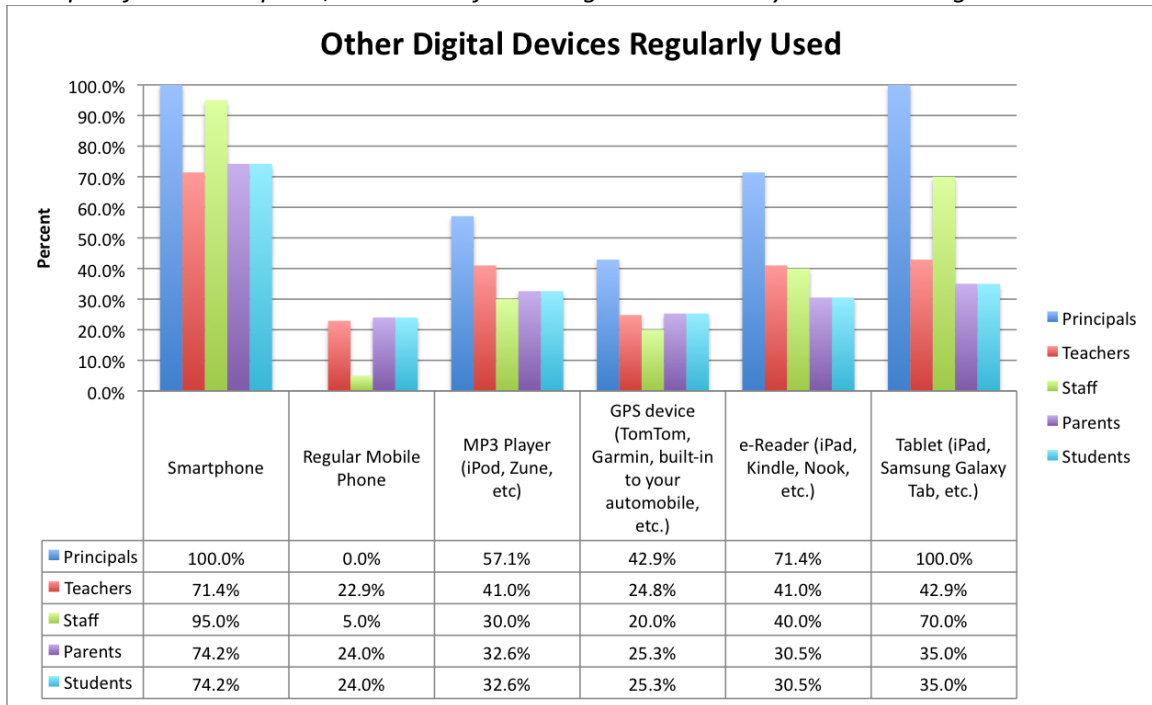
What Type of Internet Connection Do You Have at Home?



The question asks respondents about home Internet connectivity. Surprisingly 10% of WB staff report no home Internet access, and 9% of parents report dial-up access.⁸ However, the overall level of connectivity is very encouraging should the district wish to support distance learning or telecommuting.

4. Other Digital Devices in Use

Apart from a computer, what sort of other digital devices do you use on a regular basis?

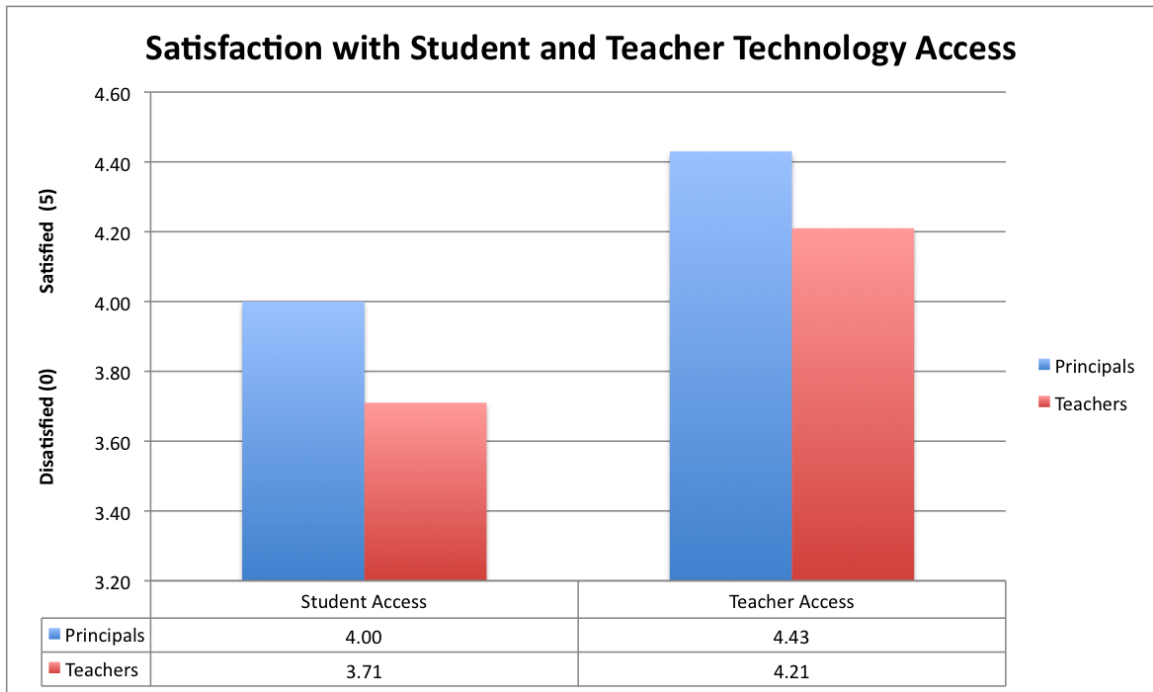


Employees, parents, and students are using a variety of digital devices for everyday use. Most popular was the use of smartphones, followed by tablet devices. Smartphones incorporate several digital devices into one, typically including a camera for stills and video, a music player, e-reader, and GPS device. While we did not ask about the specific tablet in use, informal observations by the researchers while visiting the District suggest that such devices are likely to be Apple iPads. The use of digital technologies is so widespread that many people don't think twice about their use. Taking a step towards greater integration of technology into the workplace and classroom is not a great leap but a logical step.

⁸ By way of comparison, estimates put the number of broadband users in the United States at about 77.3% of the population as of 2010. (<http://www.internetworldstats.com/am/us.htm>). In 2009, the number of Internet users with dial-up connectivity was 3% and falling. (<http://www.esa.doc.gov/sites/default/files/reports/documents/exploringthedigitalnation-computerandinternetuseathome.pdf>)

5.1 Student and Teacher Access to Technology

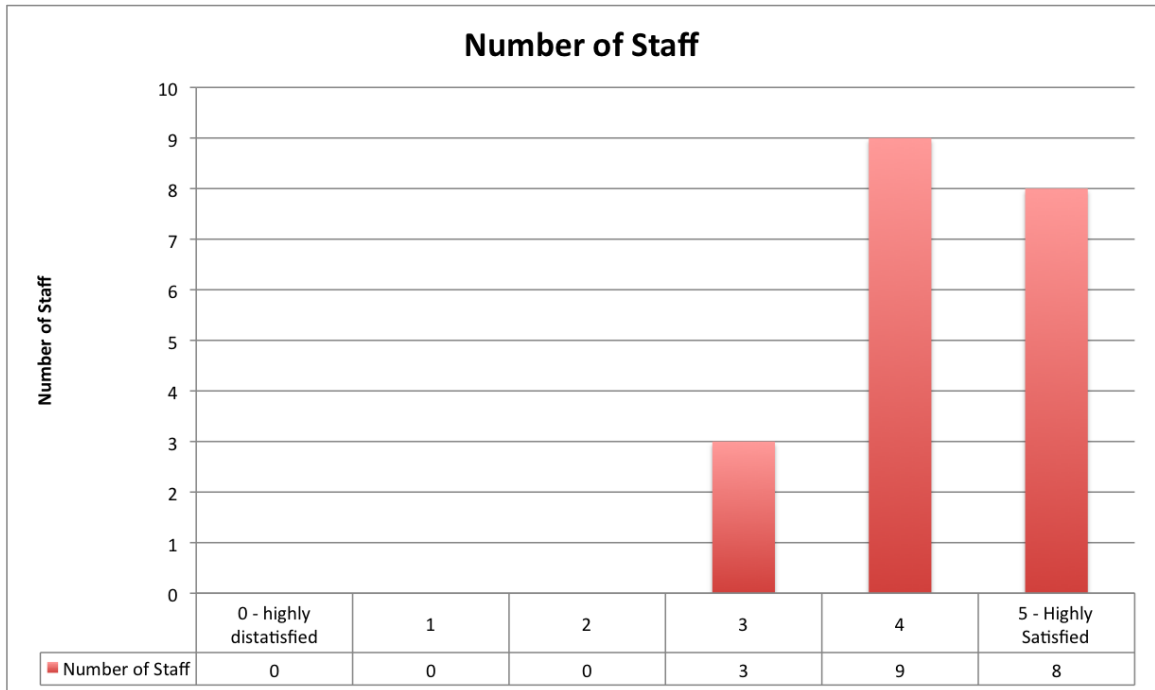
How satisfied are you with the level of access your STUDENTS currently have to technology for learning while at school? How satisfied are you with the level of access your TEACHERS currently have to technology for learning while at school?



The purpose of this question is to determine respondents' level of satisfaction of technology access for students and teachers. This is not about the quality of the computers or Internet connection, but something more basic: do students and teachers have the digital tools they need support their learning and teaching? The data suggests that there is more satisfaction regarding teacher access to technology than for student access.

5.2 Staff Access to Technology

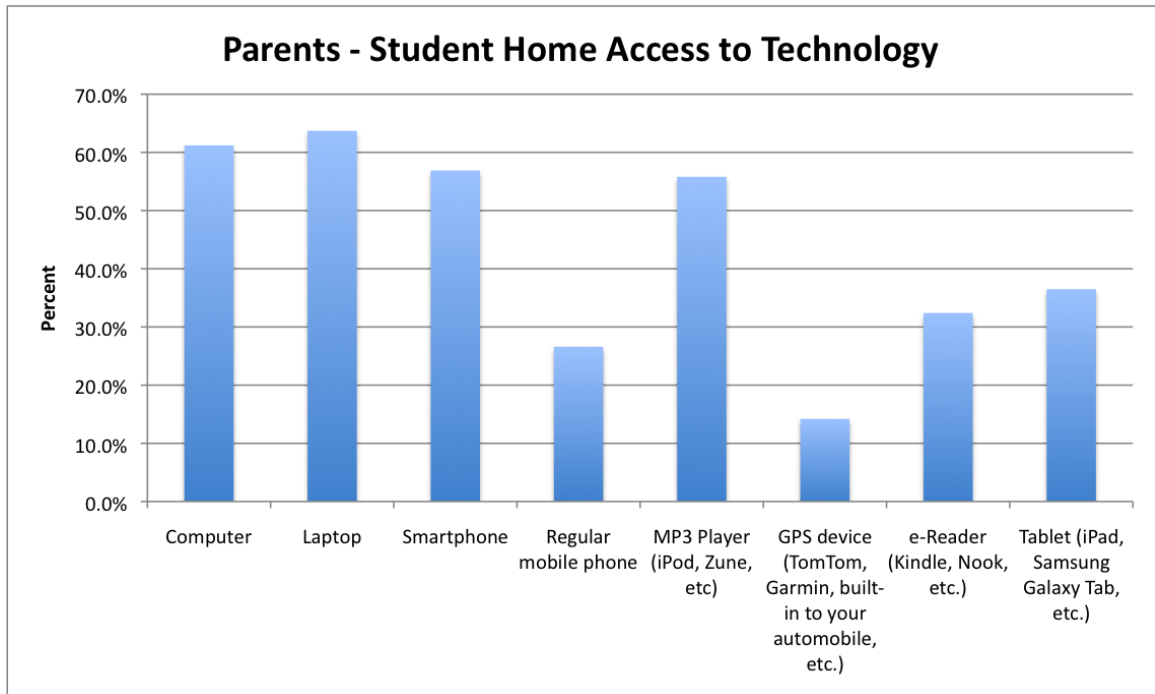
How satisfied are you with the level of access you and your employees currently have to technology for job use?



This question was asked of District Staff and is the staff equivalent of the previous question: does the district staff have the required technology tools to perform their job? The data suggests that most staff is satisfied with their current technology access. The small number of those who rate their access at a “3” can be directly addressed by District administration.

5.3 Student Access to Technology at Home

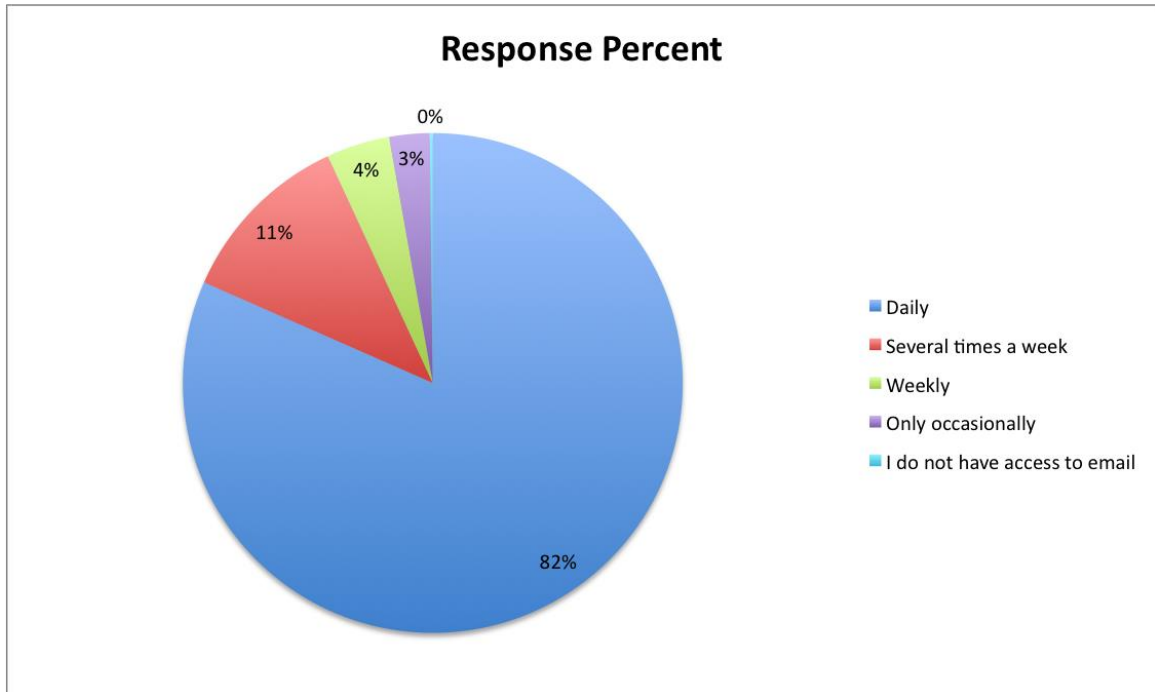
What sort of digital device does your child have access to use at home?



Question 5.3 reports information from parents regarding what digital devices students can access while at home. Desktop and laptop computers, smartphones, and mp3 players are the most widely used devices. The educational value of MP3 players in language instruction is significant, especially when the player can also act as a recording device.

5.4 Frequency with Which Parents Check Email

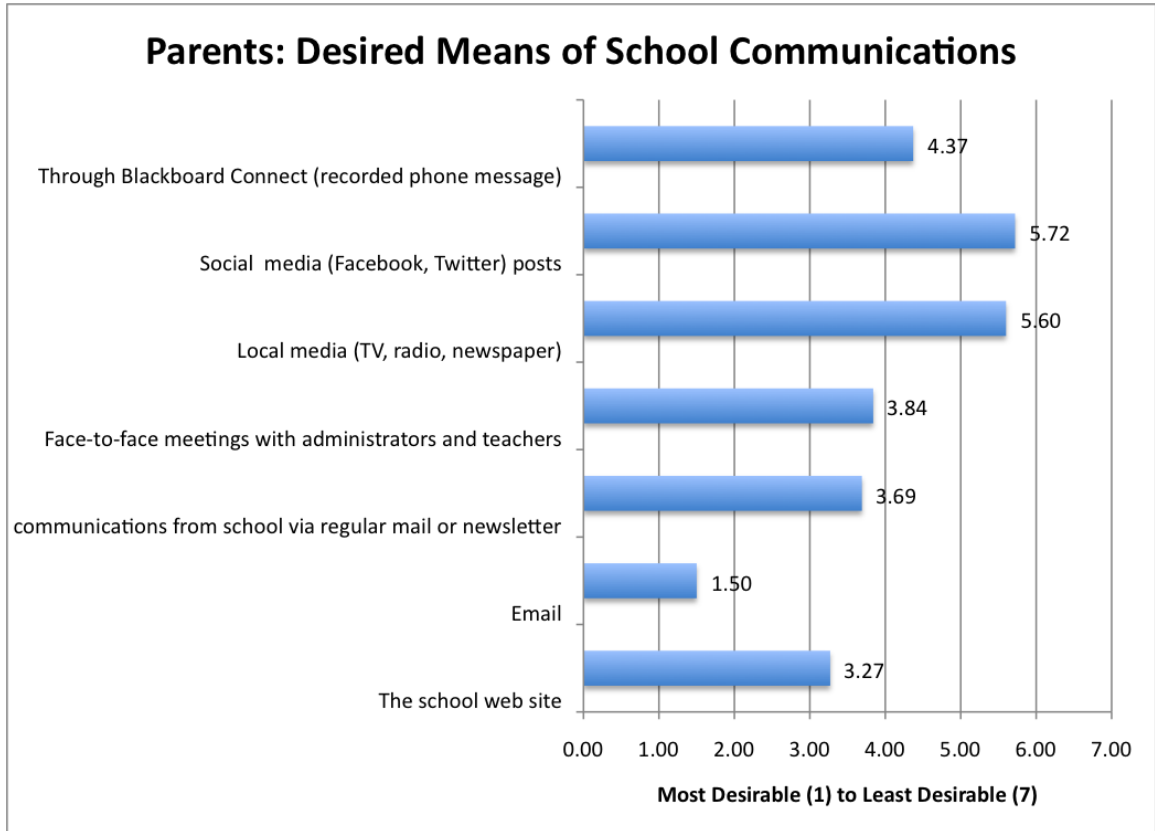
How often do you check your email?



Email is a commonly used by many schools to impart important information to parents and also plays a role in most schools' emergency notification systems. It is important, therefore, to know how frequently parents are checking their email accounts. The data shows that the vast majority of respondents check it at least daily, which suggests that email is a great system for routine information, and as *a component* of an emergency notification system.

5.5 Parents: Desired Means of School Communications

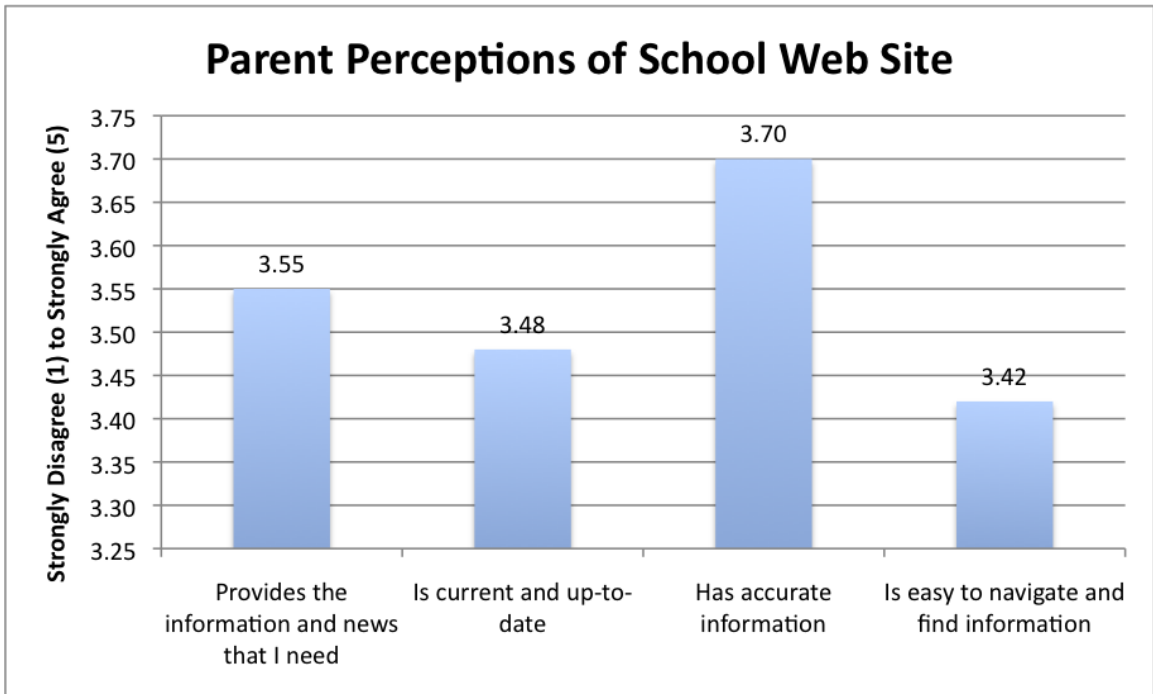
Please rank the following from the MOST DESIRABLE MEANS of SCHOOL COMMUNICATION (1) to the LEAST DESIRABLE MEANS of SCHOOL COMMUNICATION (7) by using the pull down menu.



Consistent with the frequency of email use reported by parents is the finding that email also is by far their most preferred method of communication with the school.

5.6 Parent Perceptions of School Web Site

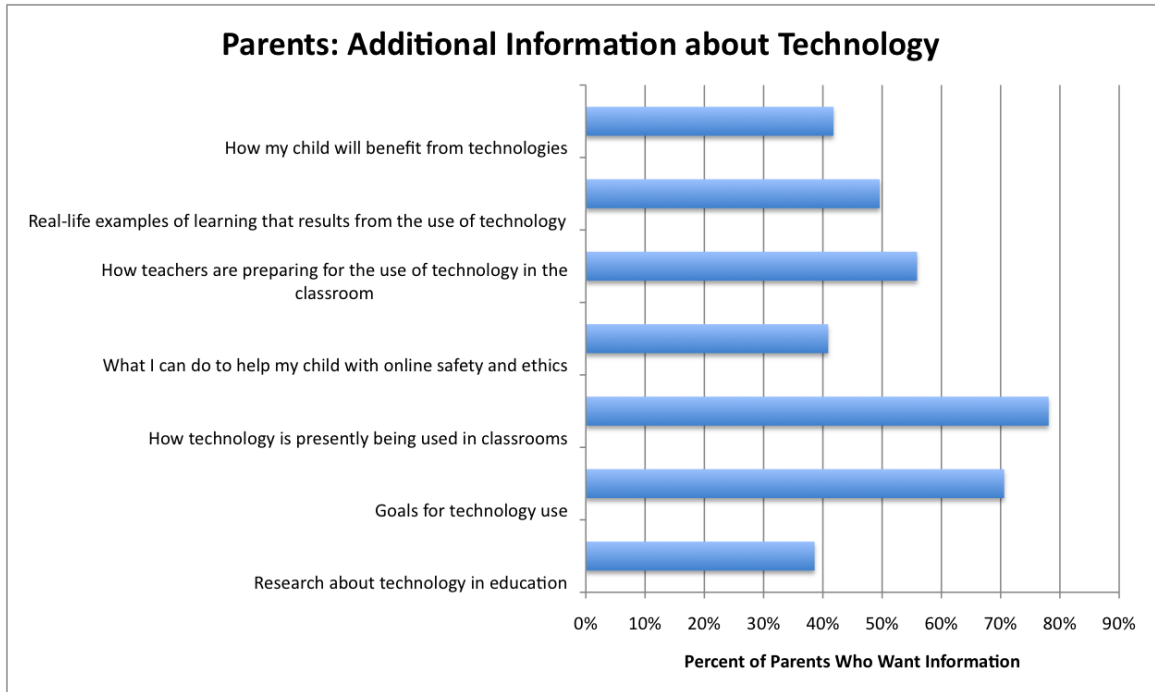
Please rate your level of agreement with the following statements. Mark N/A if you have not visited the school website. The website for my child's school:



The school's website receives middling to mildly positive evaluations, suggesting that there is room for improvement in this area. EC suggests additional follow-up with usability studies and focus groups.

5.7 Parent: Requests for Additional Information about Technology

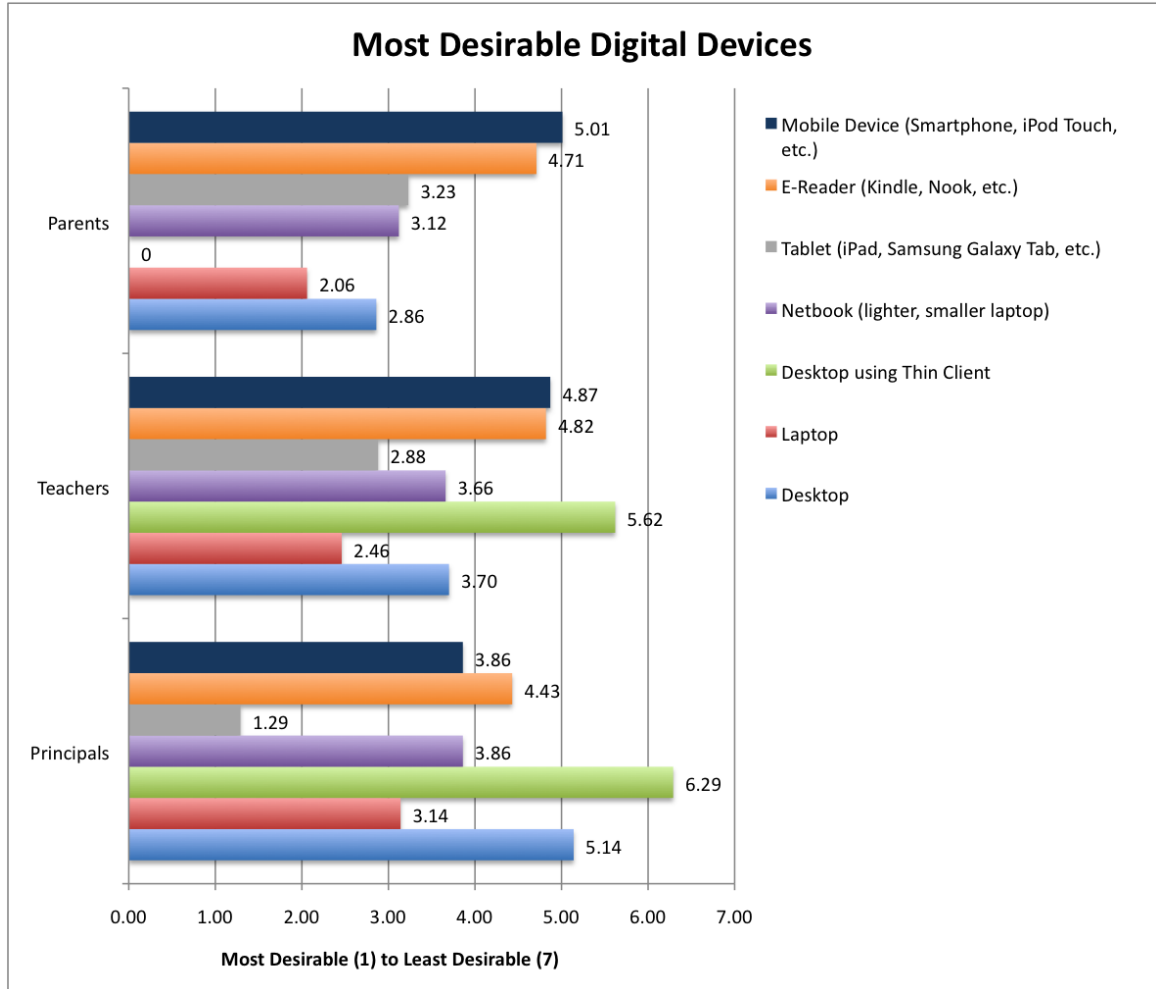
I would like to learn more about the following from my child's school (check all that apply):



Many parents are interested in learning more about the District's goals for its technology program as well as how technology is currently being used in classrooms.

6.1 Digital Devices for Academic Use

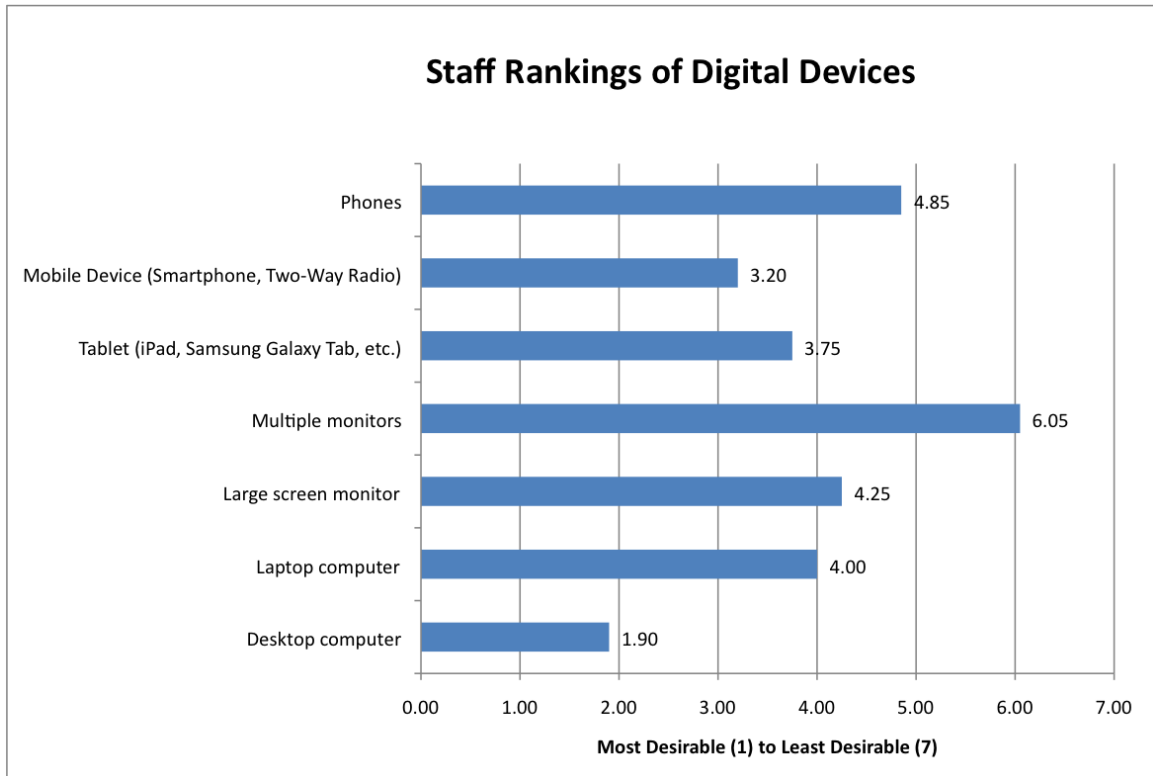
Please rank the following items from the MOST DESIRABLE (1) digital device for student use to the LEAST DESIRABLE (7) digital device for student use.



Question 5.1 asked about the *current state* of student and teacher access to technology. Question 6.1 gets at *desired* access to technology, particularly the type of digital device principals, teachers, and parents would like to see students use. This can provide guidance to the District as it considers various devices to address access issues. The data reveals a bias in all groups towards portability in the form of tablet or laptop devices.

6.2 Digital Devices for District Staff Use

Please rank the following items from the *MOST DESIRABLE* (1) job-related digital device for student use to the *LEAST DESIRABLE* (7) digital device for office use.

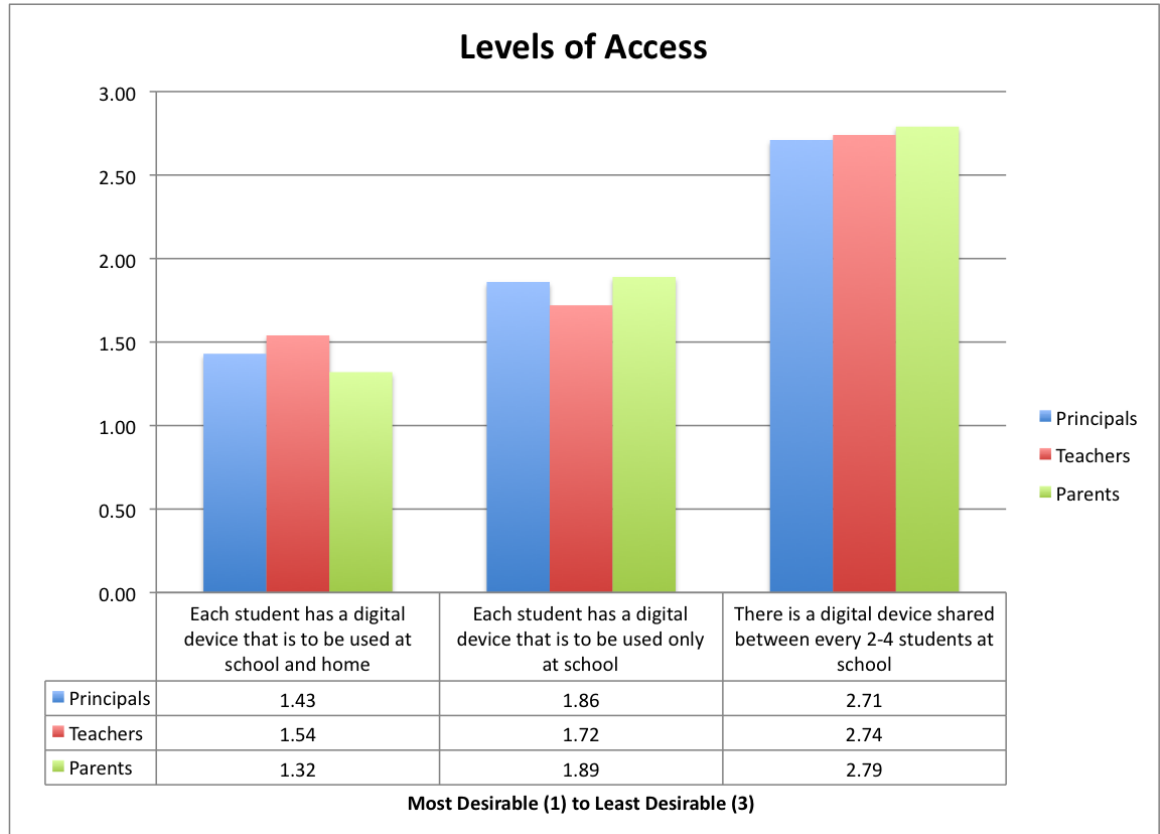


Question 5.2 asked district staff about their perception of the *current state* of their access to technology. Question 6.2 gets at the *desired* access, particularly the type of digital device they would like to for their use. This can provide guidance to the District as it considers various devices to address access issues. The data suggests that multiple monitors are the least desired, however the use of additional monitors and/or large screens is supported by industry data as a means of increasing worker productivity.⁹ Certain users, such as those who deal with spreadsheets, databases, IT systems, and multimedia often reap great benefits from a multiple monitor setup.

⁹ See <http://www.nytimes.com/2012/02/08/technology/for-multitaskers-multiple-monitors-improve-office-efficiency.html> and <http://research.microsoft.com/pubs/64317/interact2003-productivitylargedisplays.pdf>

7. Ratio of Students to Digital Devices

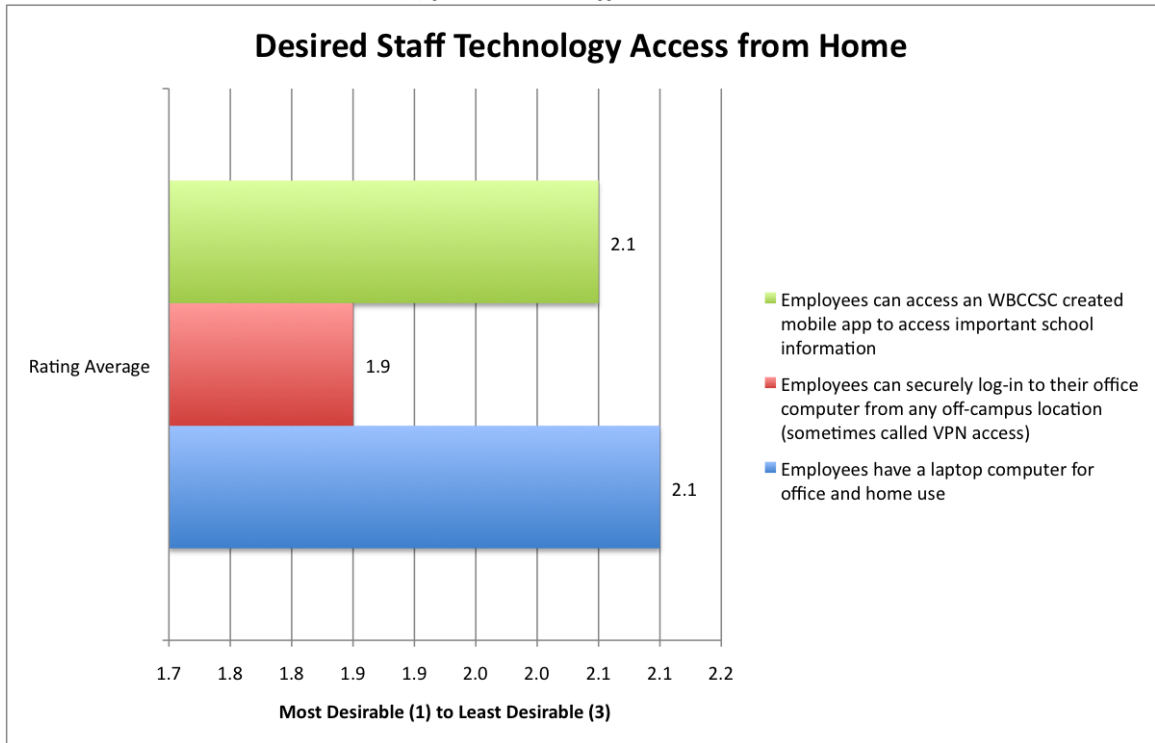
Please rank the following from the MOST DESIRABLE LEVEL OF ACCESS (1) to the LEAST DESIRABLE LEVEL OF ACCESS (3) for student access.



This question addresses the issue of student technology access from the viewpoint of the model for providing students with digital devices, particularly the ratio of devices to students, and where the devices are to be used. Coupled with the data from Question 6.1, this can provide guidance to the District about a 1-1 model of computer use. These data are somewhat perplexing to EC. The data in question 6.1 suggests a model supporting the use of portable digital devices. Tablets, given a slight edge in 6.1, are inherently personal devices. Yet the data in question 7 suggests a strong preference for a shared ownership model, a computer to student ratio as high as 4-1 and not a 1-1 model that usually accompanies laptops and tablets in schools. Cross-tabular analysis of data might reveal if there are grade level differences.

8. District Staff Home Access to Business Systems

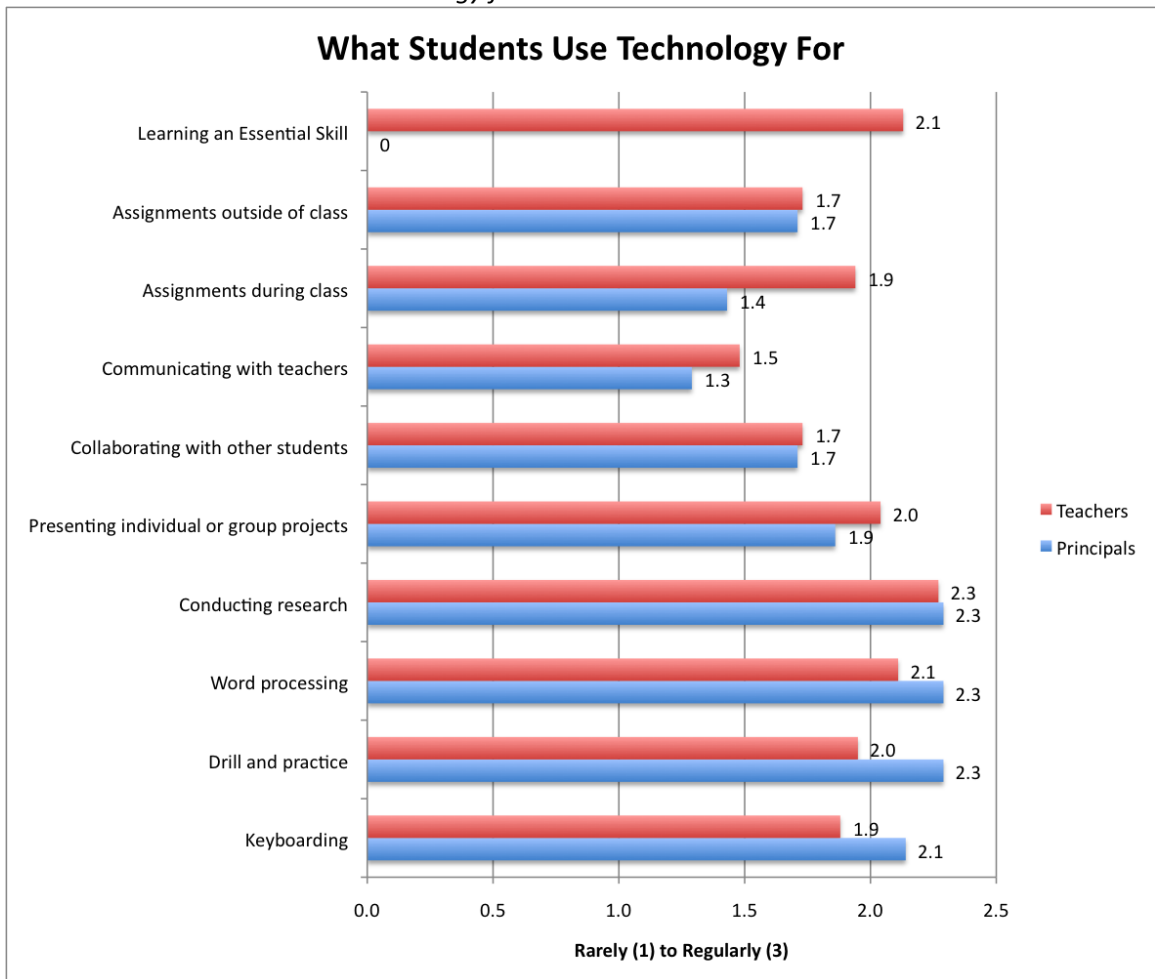
Please rank the following from the MOST DESIRABLE LEVEL OF ACCESS (1) to the LEAST DESIRABLE LEVEL OF ACCESS (3) for district staff access



This question comes at district staff technology access from the viewpoint of employee access from home to school business systems. The data reveals substantial interest in a school issued laptop computers for home and school use followed closely by a mobile application to provide access to important WBCCS information.

9.1 Technologies Currently Used in the Classroom

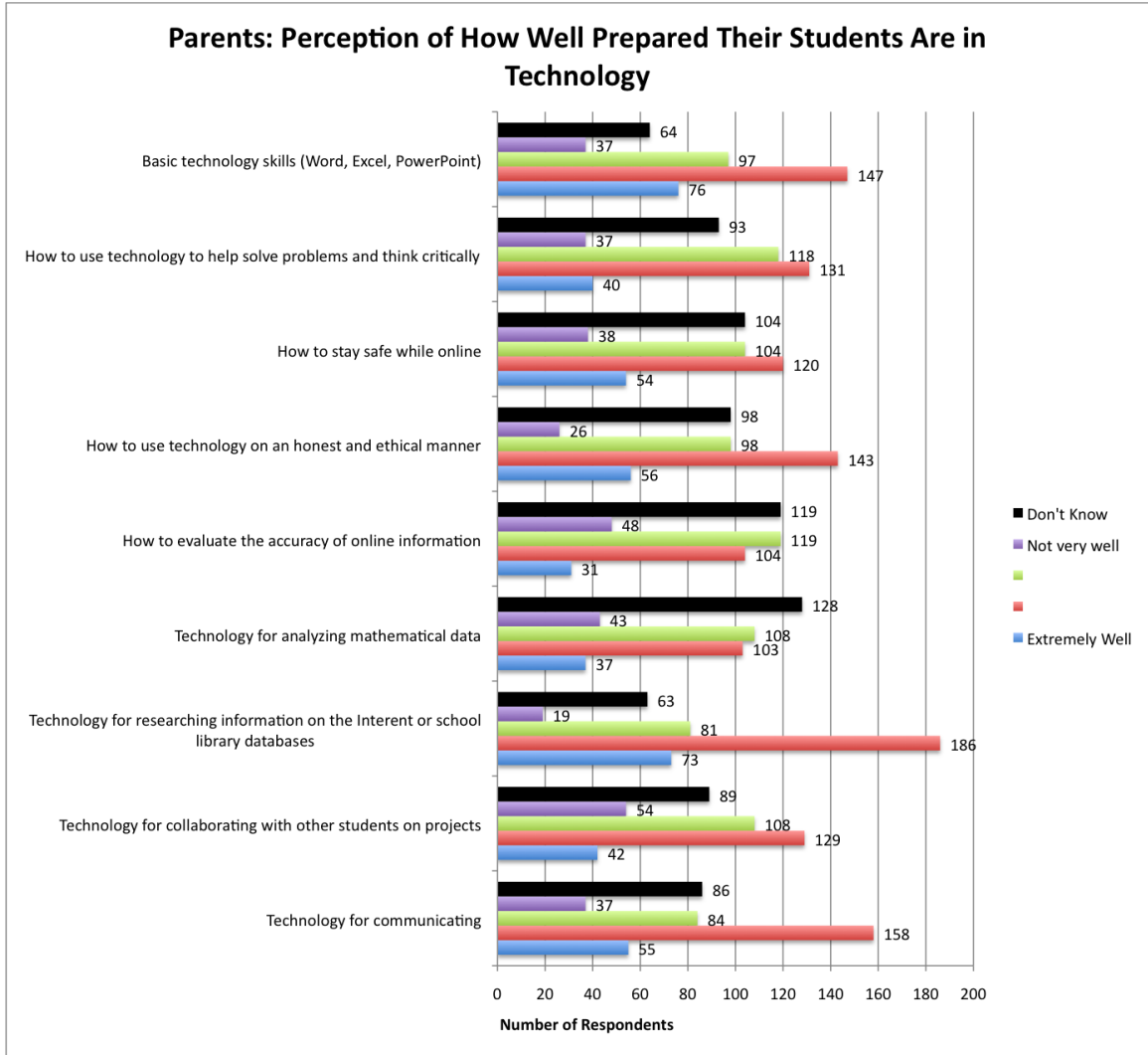
Indicate the degree to which these statements describe student technology use in classrooms. Students use technology for:



How is technology currently employed in the District’s classrooms? Teachers and principals agree that the most regular use is in the areas of “conducting research” and “word processing,” and teachers themselves point to “learning an essential skill” as another top use. Using technology for communication between students and teachers is the lowest rated use.

9.2 Parents: Students Preparation in Technology

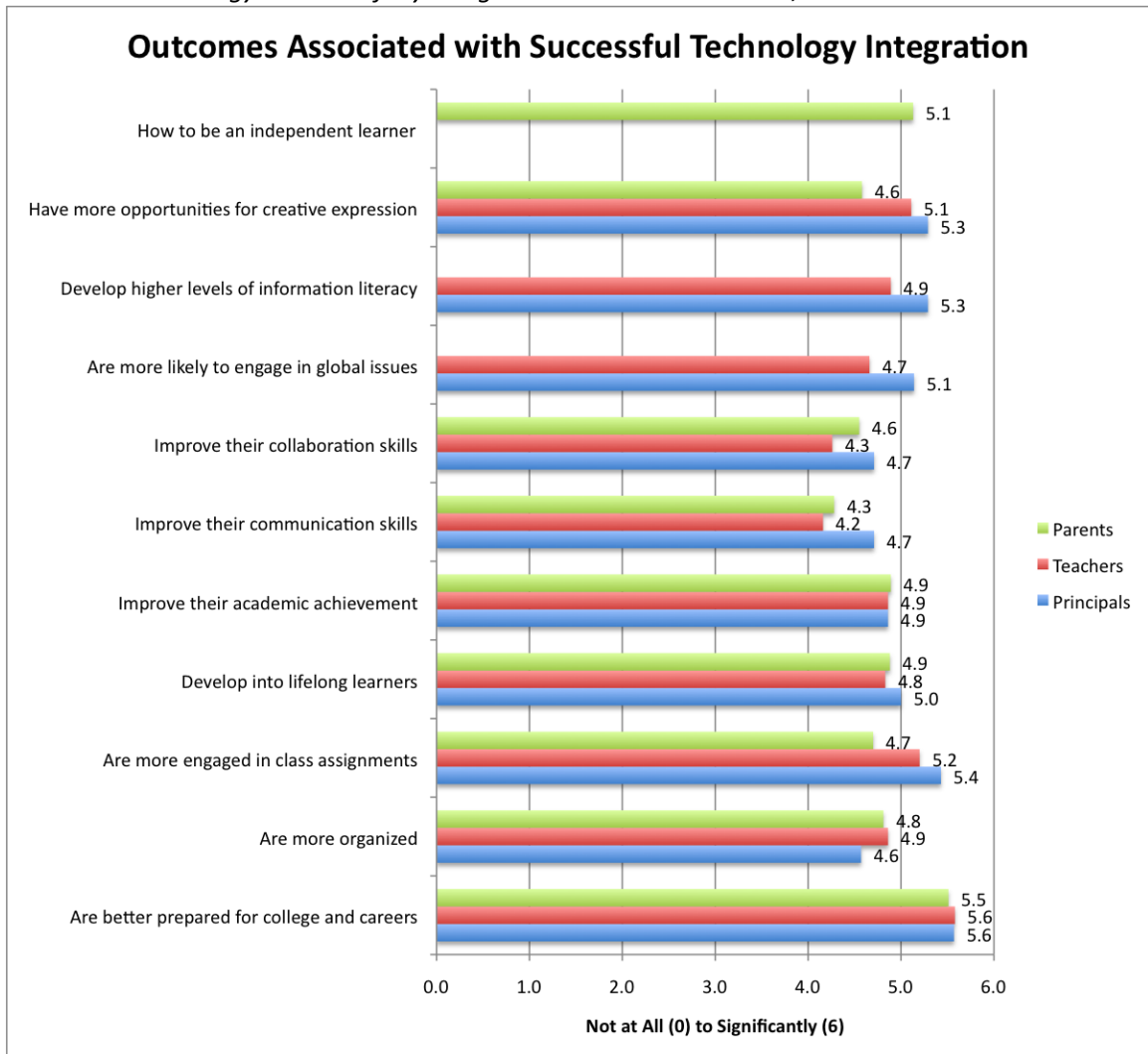
How well has WBOCCSC prepared your student(s) in each of the following areas?



The data in this area is remarkable for its variability and for the number of “don’t know” responses. That said, in all categories the most frequent response is in towards the higher, more positive end of the scale. Coupled with the responses in 5.7, this suggests that the district needs to communicate its message about technology to parents with greater clarity. EC speculates that many of the positive responses may come from parents that are more involved with the school, with negative perceptions associated with lack of knowledge. Focus groups or other means of assessing the parent population is indicated.

10. Educational Outcomes

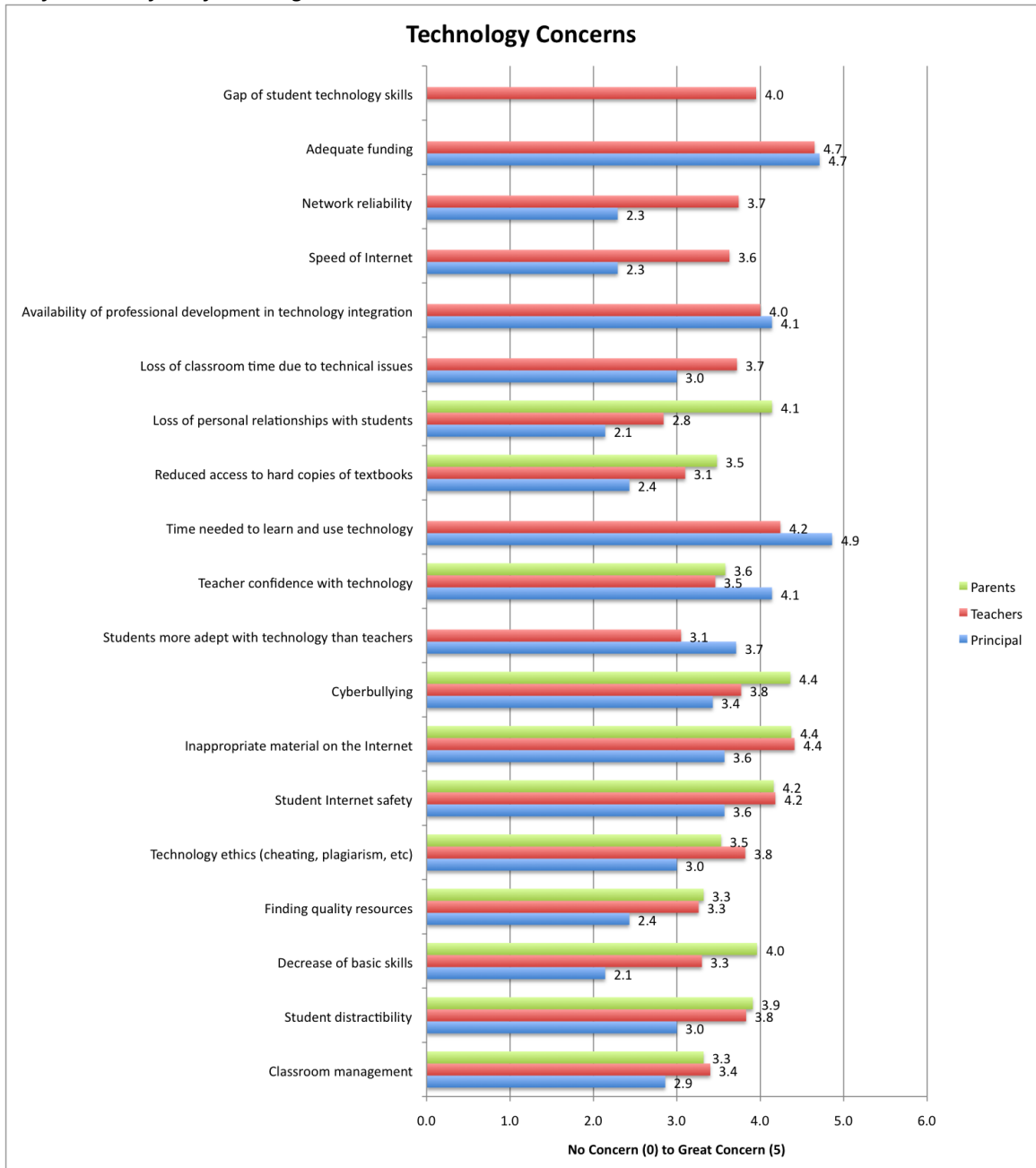
When technology is successfully integrated into the classrooms, students...



What happens when a school successfully integrates technology in the classroom? Principals, teachers, and parents in the District agree on two significant positive outcomes (>5points): “Students are better prepared for college and careers” and “students have more opportunities for creative expression.” However, *all* questions received quite positive rankings.

11. Technology Concerns

As you consider the integration of technology at your school, indicate your level of concern for each of the following issues.

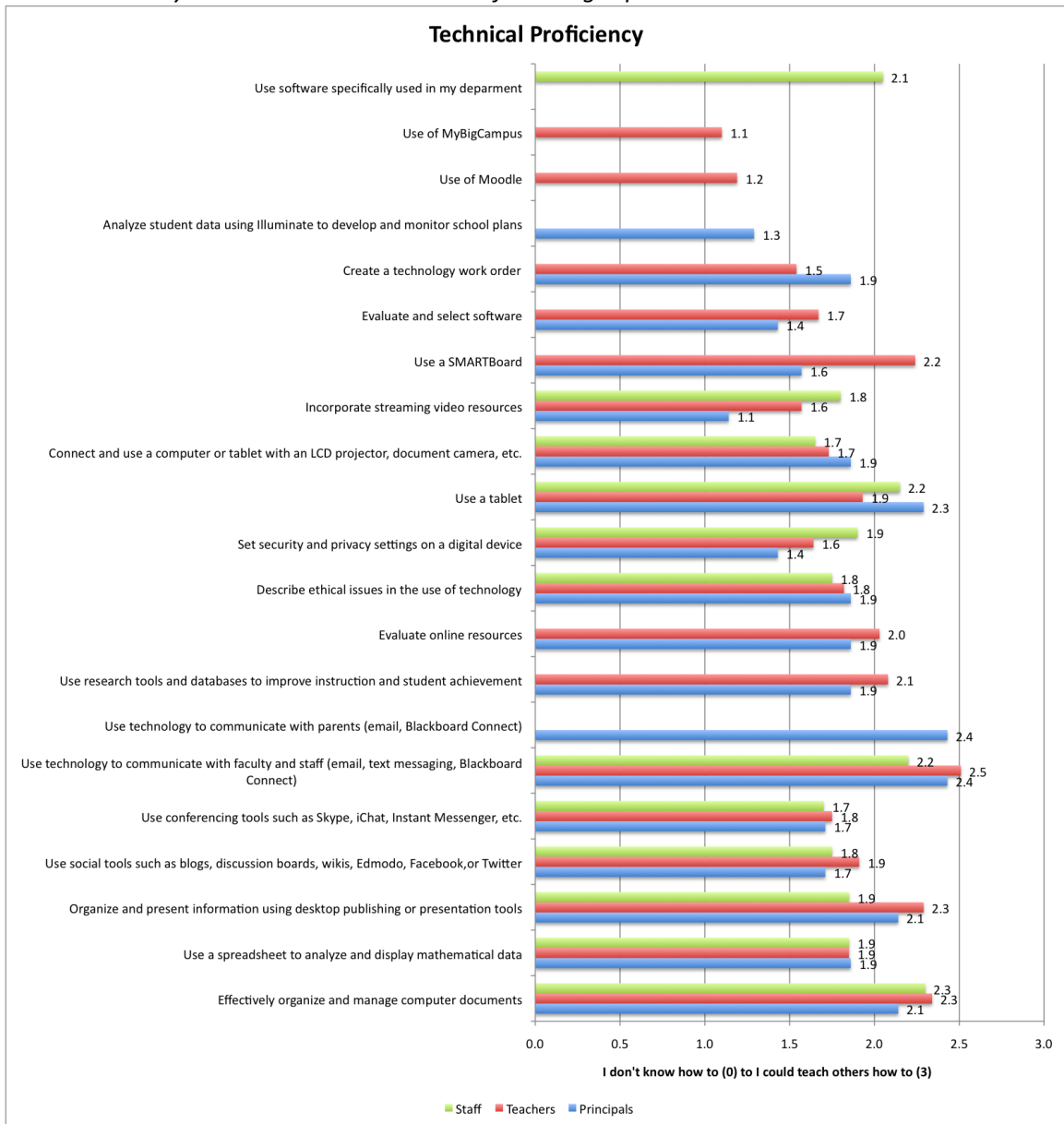


The data in this section may provide clues to the equivocation respondents' seem to have regarding educational technology. Question 10 suggests points towards positive outcomes

while Section 11 data reveals significant concerns associated with increased use of technology. A lack of time and professional development are often associated with one another, as are security (safety, inappropriate materials, cyberbullying) and classroom management/student distractibility. EC recommends an approach to address such concerns that has professional development at its core. As expertise and knowledge increases within the District, a foundation for address other issues such as content filtering and classroom management also begins to take shape. Concurrently, the District should share reports about professional development and classroom use of technology with the parent community.

12.1 Technology Proficiency - Employees

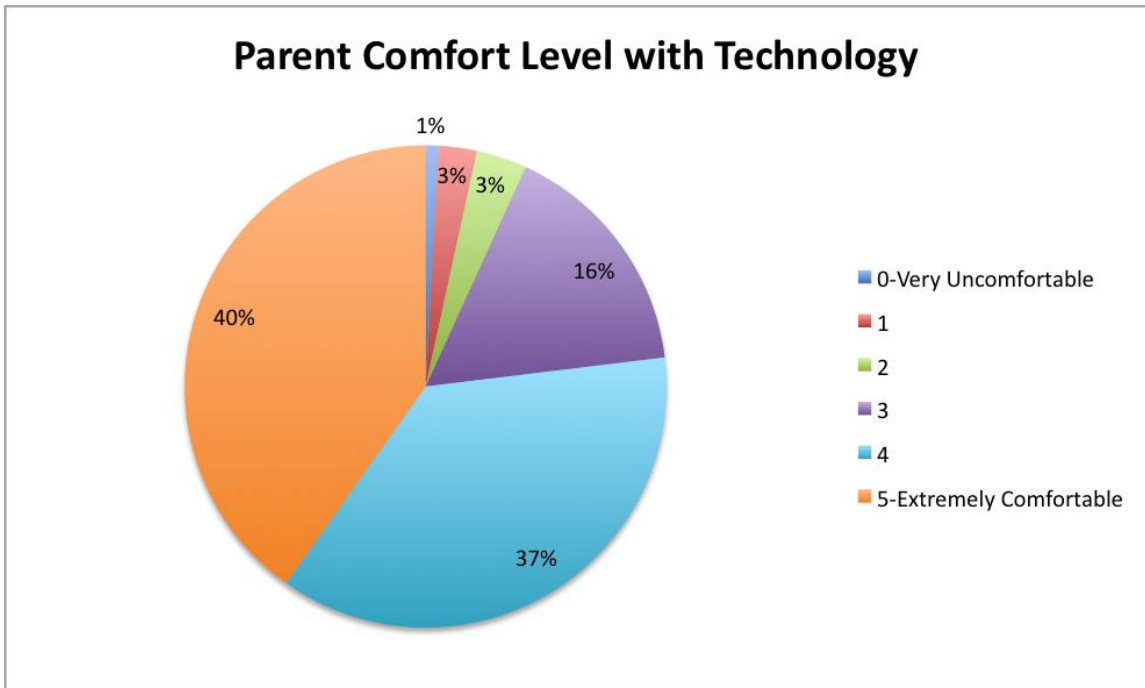
Please rate your current skill level on the following topics related to each tool...



Section 12.1 focuses on the self-assessment of employees skills regarding technologies currently use in the District. The results in this table can be used by the District to help determine the topics to be addressed in Professional Development programs. By using self-identified experts within the community, the District can both save the expense of using outside trainers as well as offer opportunities for skilled employees to share their expertise with their colleagues, perhaps even allowing for a mashup of district staff, principals, and teachers in the same professional development sessions.

12.2 Technology Proficiency – Parents

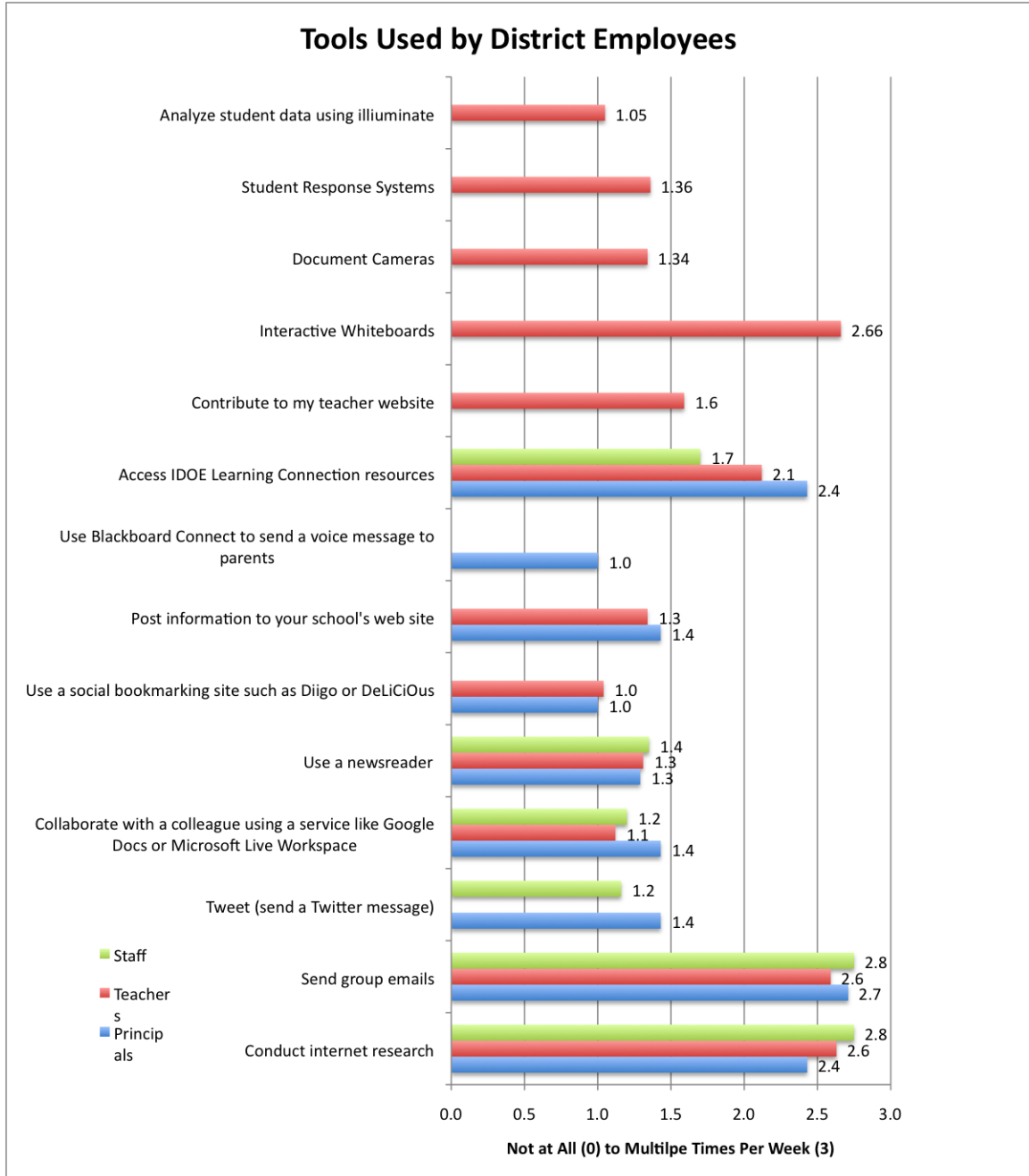
Please rate your level of comfort using technology.



Section 12.2 describes the comfort level of parents is using technology. In many households, children come to know more about technology than their parents, a source of pride, amazement, and some concern. The District can help increase the overall technical literacy of parents through adult education classes, parent workshops, newsletters, open houses and technology fairs featuring student and faculty technology projects.

13. Tools for School Administrators, Teachers, and District Staff

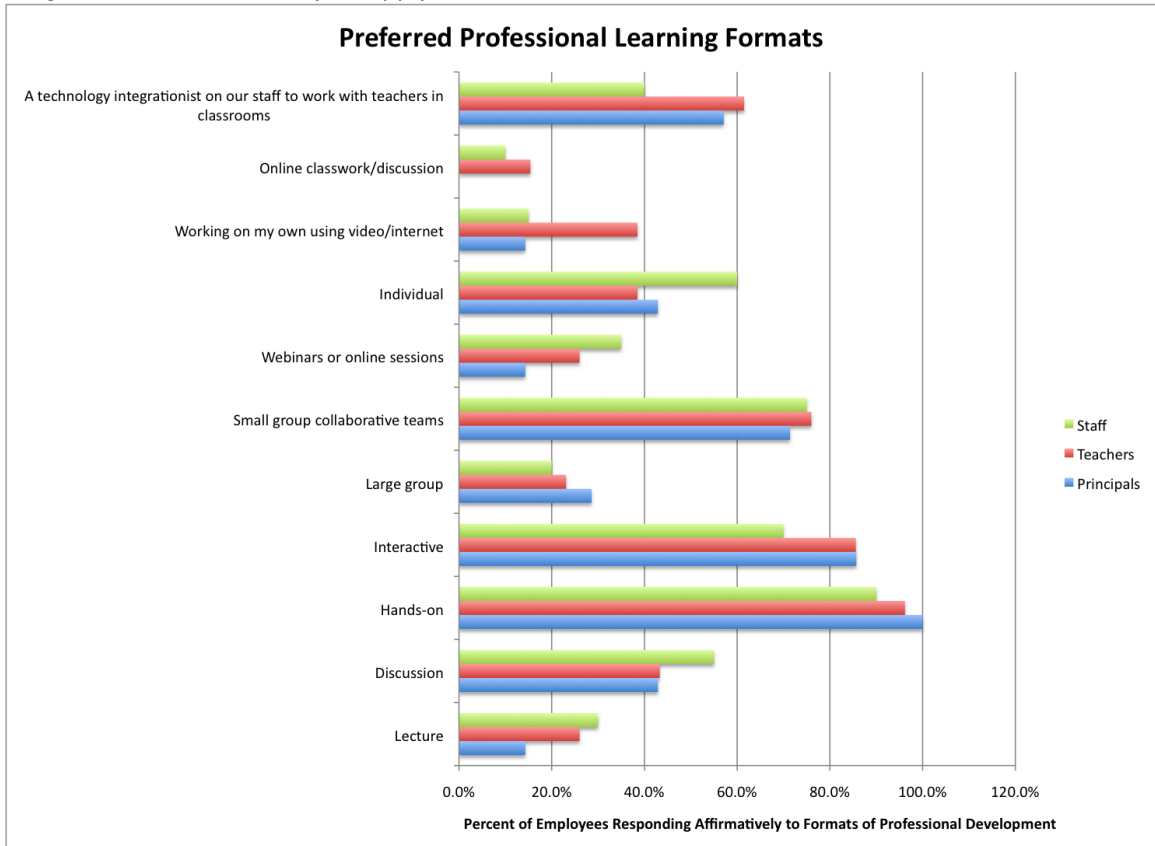
Listed below are tools that principals, teachers, and district staff may use while performing their jobs. Please indicate the degree to which you make use of such tools.



The responses in Section 13 focus on self-perception of proficiency. The data in this table focuses on frequency of on-the-job use of various technologies.

14. Formats for Professional Development

Which professional learning formats work well for you when learning about technology integration? Check as many as apply.



The preferred mode of professional development methods for all groups is “hand-on.” This is sometimes easier said than done as some school districts lack the facilities for such training, training that can replicate as closely as possible the actual work situation for employees. Conversely, the least preferred modes of learning are lecture (let this be a warning to teachers!) and online class work with discussion.

15. Open-Ended Final Comments from Respondents

- I would love to have an iPad for the classroom, with a set per grade level. It seems that when they aren't always available and close by you forget they are there to use. iPods would be great as well.
- I enjoy using new technology but have a hard time finding the time to learn new things because of all the other work I now have to do. I wish I had more time to find, integrate and use technology in my classroom. I want my students to have more opportunities with technology but I am afraid I will loose valuable learning/classroom time.
- I use technology in my classroom all the time since I have computers in my classroom. The use of this technology has definitely been beneficial in all avenues of their learning: writing, reading, drilling vocabulary, preparation of papers, graphs, researching, etc. I would use computers daily if I had enough for all my students.
- I have received various PD in technology. However, with the rapid changing technology, if something isn't incorporated immediately, it is likely that the motivation to use it will be lost when other concerns crowd for the time needed to practice and develop the use of technology in the classroom. Traveling to and from labs, settling the class, supporting different levels of ability while using/teaching the proper use of the technology, makes regular student use seem daunting for both student and teacher in certain situations. When laptops rental replaces the costly book rental, where students can use the laptop/tablet to replace the textbook, we might make progress on student technological skills.
- Because the nature of my department is different than in a traditional classroom, it is difficult to provide for our technology needs. Access to students is difficult. Access to students and technology is even more of a challenge. The most efficient means of utilizing technology in my area would require one to one computer access.
- I think the even greater incorporation of technology in curriculum on a daily basis is very important. I have a few concerns. One, will a school be able to keep up with the constant change of technology, it is only a matter of time before what is cutting edge today is dated within a year or two. Does the district have the funds to stay cutting edge at the rapid changing pace of technology? Second, will teachers be required to purchase smart phones., apps, and tablets with their own money to be able to provide instruction with cutting edge technology? Last, how do we not leave behind the students who don't have good access to 21st century technology outside of school while providing the challenging opportunities to students who have access and are capable of using the latest technology?
- My main concerns would be that if students have more technology available to them, that the issues would increase (broken computers, laptops needing repairs, etc.). We currently do not have the support for. It is tough to have a classroom full of netbooks

where 2 students can't work because their computer is getting repaired. We would need to be sure that our technology department would grow in size, too!

- As with anything, technology is a resource, not THE way to instruct students. I 100% believe that students need to have a strong foundation in technology to truly be successful in today's work field. Specifically, students who are planning to attend 4 year universities need to be better prepared to submit assignments online, collaborate with others online, etc. Naturally, a good teacher will not allow basic communication skills and positive interactions with students to disappear just because there is more technology use in the building."
- Any experience we can provide to further student's knowledge and use of technology will help them in the future. The fact that technology usage is not tested (ISTEP, acuity, etc) makes it difficult to take class time away from teaching those standards to focus on technology.
- I believe technology can enhance learning and therefore should be used as much as possible.
- The lack of computers within my classroom is always a real concern. I am always struggling to modify assignments to meet my lack of technology. In a perfect world, a MacBook or an iMac would be great.
- This is an area where we can set our students up to succeed in their future or fail. We have too many teachers who are afraid of "new," and it hurts our students when they leave and go into their adult lives. This is an area where MOST of our students will have to be able to excel in the future to be a successful worker in almost all fields.
- I feel pretty competent using the technology that we have available to all staff - computers, SMART Boards, clickers, labs, etc.
- I do not have a tablet or smartphone at this time, which makes me feel like I am getting left behind a little bit from others who do.
- I feel like if I did have one of those items, I could quickly learn and become competent using it, and that it would enhance my instruction.
- I would like to see a 1-1 device to student for our students. However, I think the biggest obstacle to the success of this would be adequate training for the staff. We are at so many different levels and we will need training and TIME resources to practice what we have learned. I get frustrated when we have a presentation on something then don't have time to try it and then by the time I think about using it, I have forgotten how to use it.
- I do not like the idea of one to one with students. I still believe that students need to have and know how to use textbooks but I would love to see more technology available to the students in the classroom. My class could benefit from laptops and iPads in the classroom and I would even love to have MP3 players for each student. I see technology as the piece that supports learning rather than it becoming the teacher or replacing what I already do in my classroom.

- I think it would be best for us to get department sets of laptops. Students wouldn't have access to them all the time but we wouldn't constantly be fighting over who gets the computers. I think it is a disadvantage to the students if they are not given ample opportunities to use computers in every class.
- I would love to replace textbooks in my English class with laptops or iPads that are restricted to school use only.
- I believe our school needs to take a step towards 1 to 1 integration. It's not that it is necessary, but if we choose not to then I feel we are falling behind other schools. One of the major problems with education is our unwillingness to change and in this instance, I feel change is for the better.
- I struggle to find time to learn about new technology and programs to use in my classroom.
- I support a one-to-one student to computer ratio as long as students have access to the Internet at home as well.
- It would be highly effective to have more access to resources for each student in classes. This would enable more effective use of online materials as well as giving students the opportunity to learn about resources, which can help further their academics.
- As we move forward with technological tools for teachers and students, we to keep in mind that not all teachers are teaching the same content and what may work in one classroom may not work in another, i.e. science: probes and data collection equipment, lasers
- Manufacturing: Computer numerical control (CNC) devices, robotics
- Video recording devices for special projects.
- I believe technology is important, but I have huge concerns for our rural families who don't have reliable (or any) access to Internet service.
- Maybe technology should be added to the list of multiple intelligences allowing us as a teaching community to recognize that for some students (and teachers), it is a strength, and for others, not so much.
- Does technology intrinsically motivate students to learn and become lifelong learners (I'm not sure that it does)?
- Where are we as a corporation on the spectrum of technology integration compared to other school systems?
- Have results been followed from other countries' schools that are more technologically advanced than Western Boone?
- What do studies show in reference to the questions we've answered in this survey?
- In my opinion, technology is appropriate and successful when used to aid learning not when used to replace face-to-face and human interaction.
- Students need to have technology available to them. But, in a school system that serves the clientele that we serve, it will take some work to be able to send home laptops.

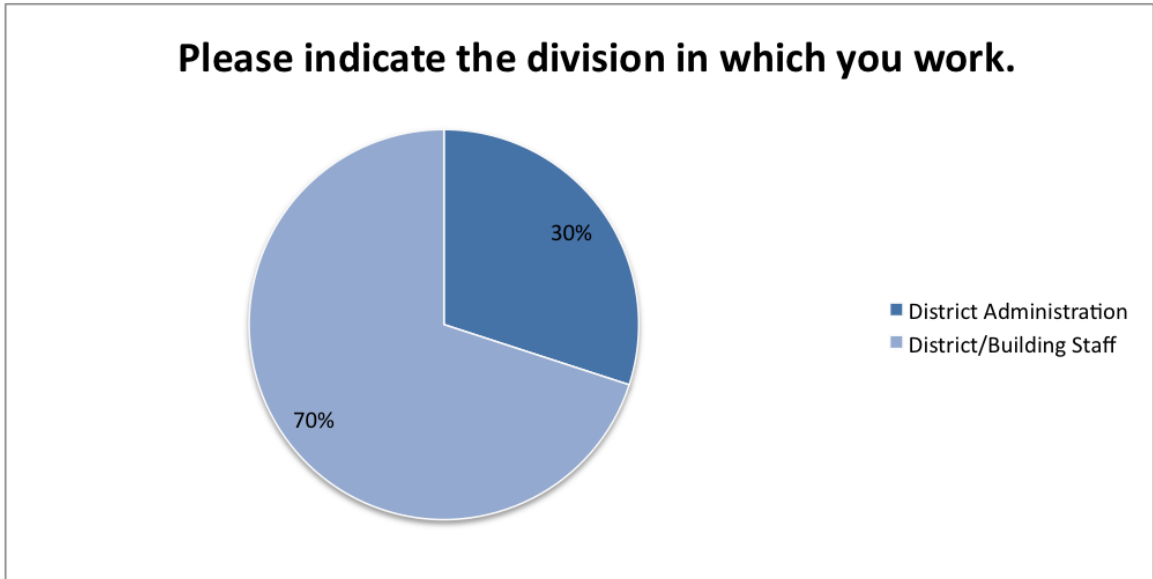
Several families would not be able to take care of any piece of technology and make sure it is returned to school.

- Most students have access to many types of technology every day. It is important that we have the same access to technology. While I appreciate having an iPod cart, netbooks and SMART Response clickers available in our building, I don't ever seem to get the chance to use them as they are already signed out. For example, I have many students who read every evening. With only 2 student computers in our room, they do not get to take their AR tests in a timely manner. One teacher has the iPod cart signed out for every day during the time that I would be able to use them. My students often ask when we will get the chance to use them. Even if we could have 10 for use in our room, that would make a difference. I also believe that each teacher should have some type of portable technology that can be transported back and forth for his or her use. For example, if I work from home, and I do a lot, I have to email my school account with the websites and activities I have found. If I had an iPad or laptop, I could bookmark those things and have them ready to go the next day. It would certainly make working from home more productive.
- We need to start keyboarding at the Kindergarten level. Waiting until 5th 6th grade is too late.
- Would love to see our corporation go 1:1 with student iPads. Students right now are teaching the teachers about technology rather than us teaching them. We need to get ahead of the game!!
- While we are at a reasonable level of technology currently, we NEED to update and look to the future. Except for administrators, tablets are not an option at the elementary level. Yet tablets are the easiest, "hands-on" type of device to use for children. We do need devices that are rugged to withstand abuse, since children do make mistakes (trip, clumsy, etc.) We need enough infrastructure so that the information appears quickly, rather than taking minutes to load. Children do have short attention spans, and we can lose their attention while waiting for programs to load.
- We also want to make sure that we get something looking to the future, so that a big investment isn't obsolete in two years.
- The biggest concern, though, is that we MUST have someone to be our link between the technology and the application of it in the classrooms. Teachers do NOT have the research time needed to learn a program and try to figure out how to apply it in the classroom.
- I need more training and more TIME to practice, learn at my own pace, search out resources, access to technology at home (i.e. teacher iPad with funding sources for apps) to feel comfortable using them with my class.
- I would ask for more training on iPads. Interested in learning to use an iPad for student data collection and organization.

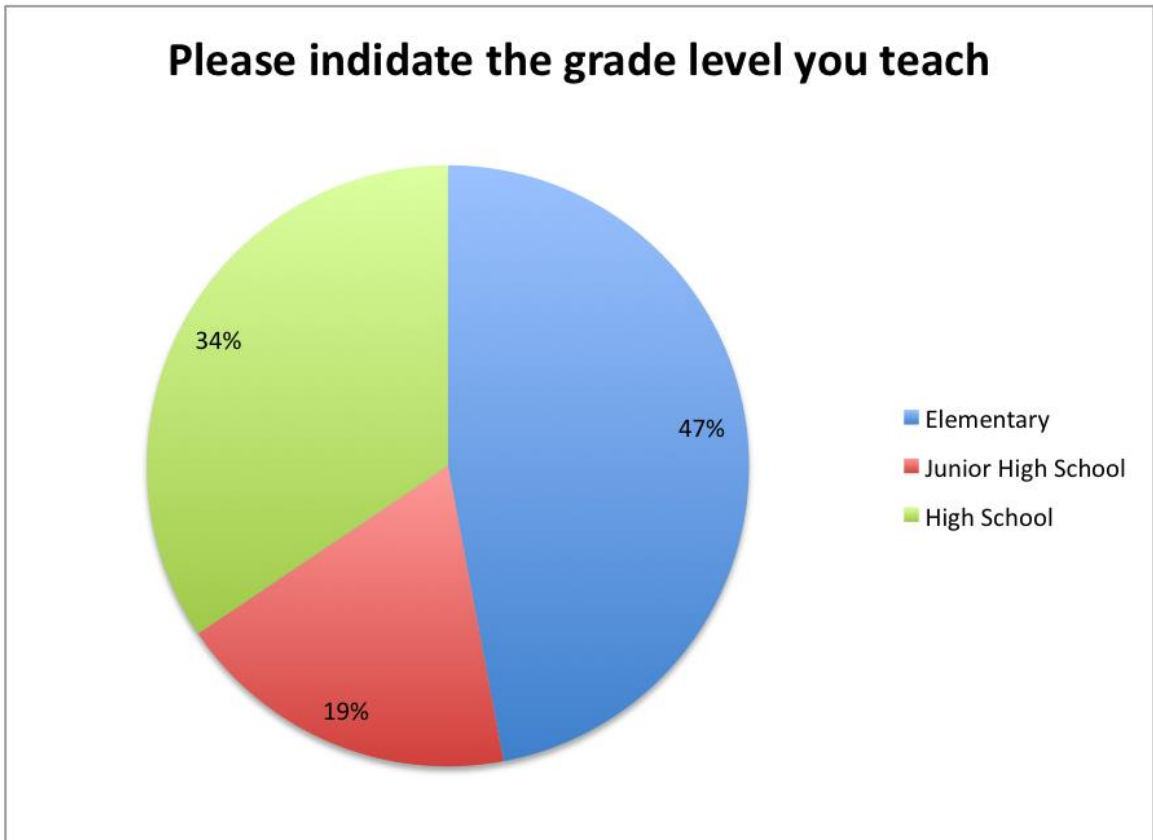
- We need more technology available to staff and students as well as training on integrating it into instruction and assessment.

16. Additional Data

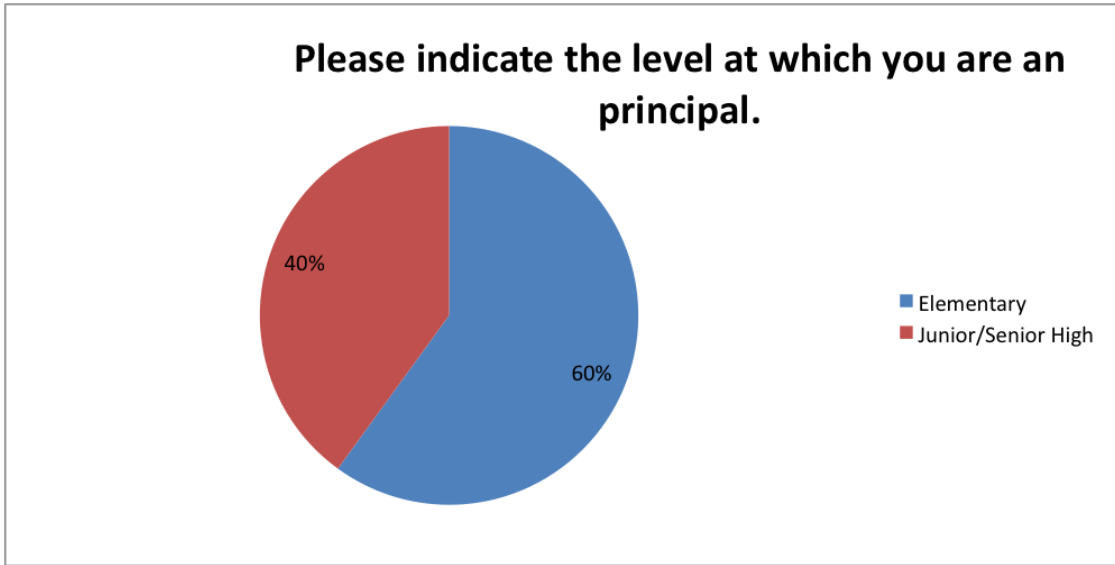
16.1 Staff Respondents by Division



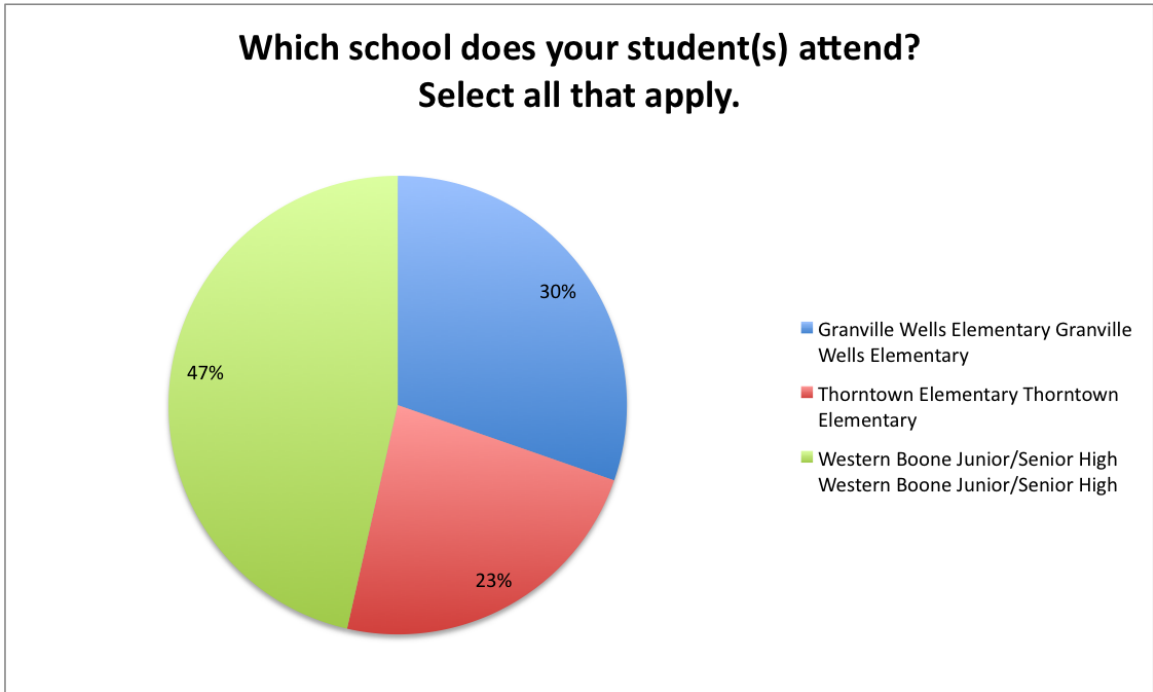
16.2 Teacher Respondents



16.3 Principal Respondents by School Level



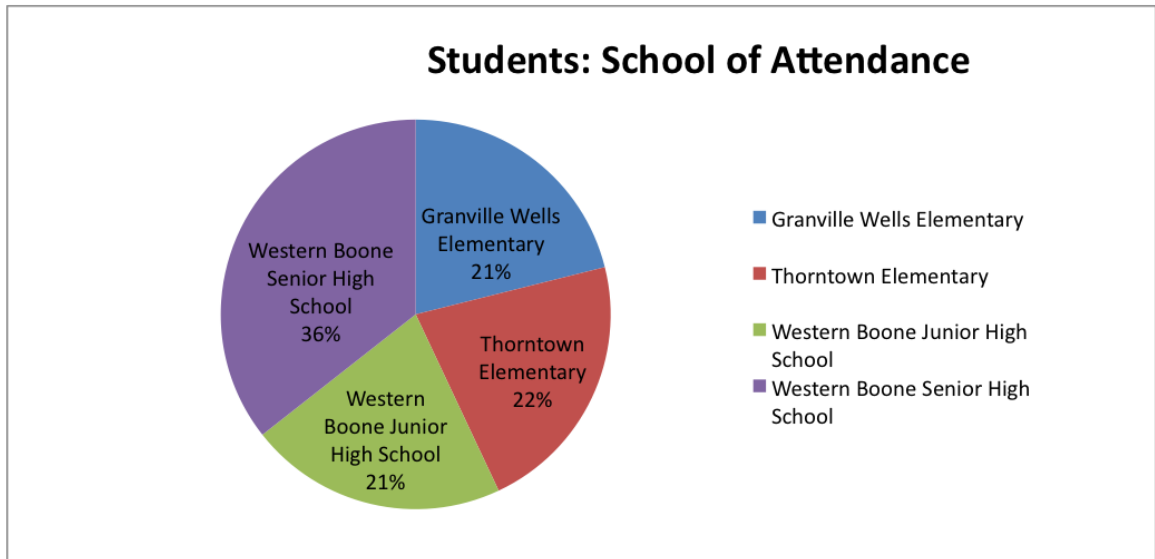
16.4 Parent Respondents by Child's School



Appendix 2 – Student Data

1. School

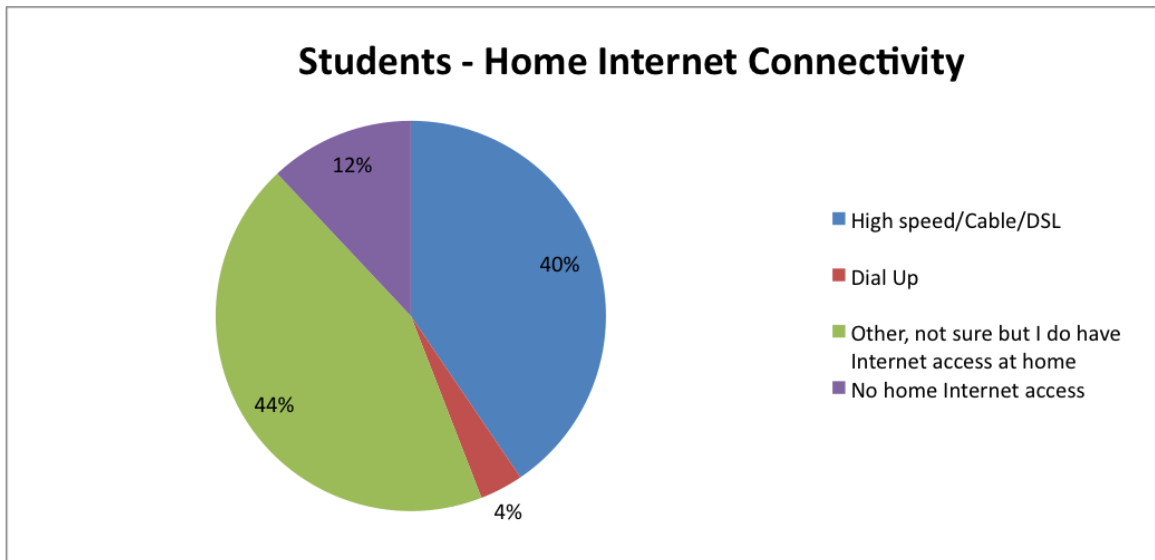
Indicate the school you attend:



This is a remarkable level of participation and distribution. The District is to be commended for encouraging such widespread student engagement.

2. Home Internet Connectivity

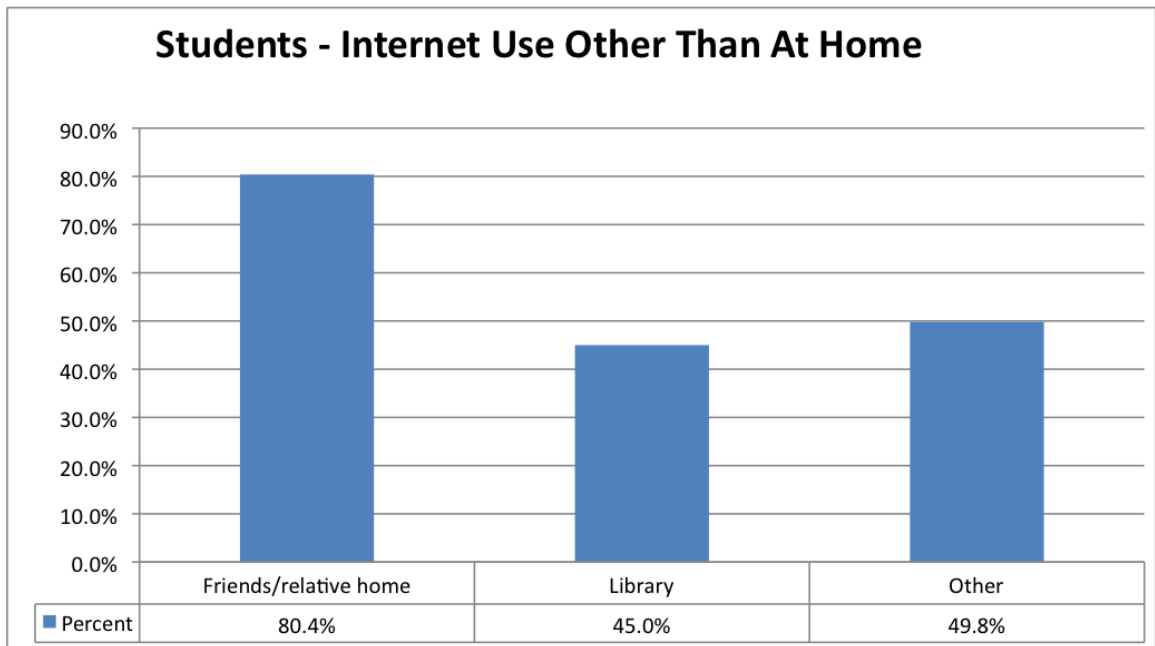
What type of Internet Connection do you have at home?



It may be that the students that responded to this question represent a different group than that of the parents who responded, but EC suspects that there is significant overlap. The large number of students who don't know what kind of Internet access they have at home is somewhat expected. High-speed Internet connectivity is rapidly becoming a utility in the same league as electricity, telephone, and water; it is taken for granted by many young people. Similarly, ubiquitous wireless access is assumed by anyone entering a business or coffee shop nowadays.

3. Other Internet Access

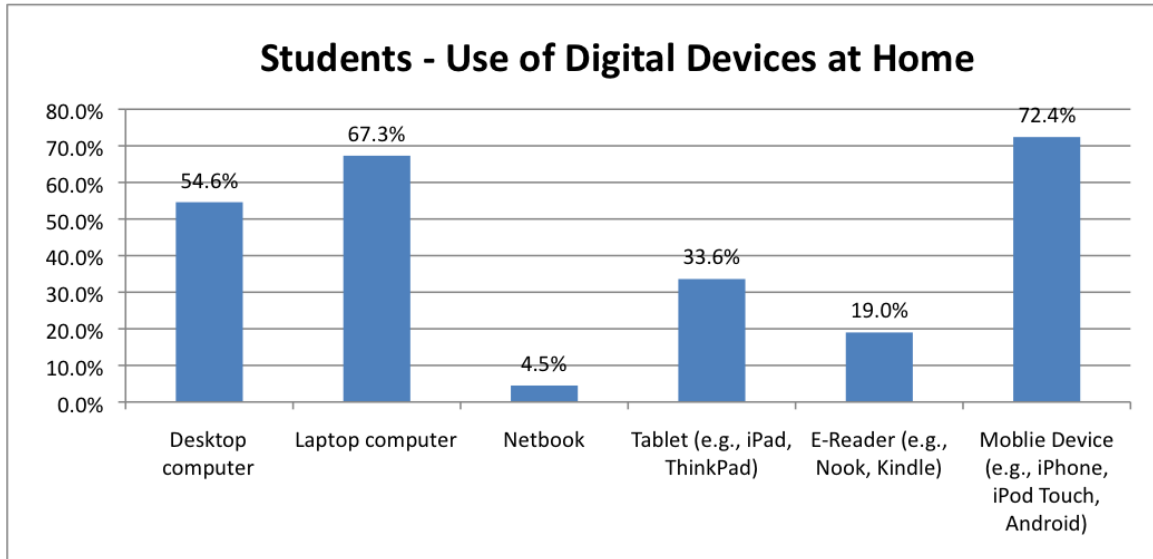
Check other places in which you visit and have Internet access. Check all that apply.



As has been said so frequently in the media, today's children represent a connected generation. Connection from the homes of friends and relatives is especially impressive.

4. Technology Used at Home

What type of device do you use at home? Check all that apply.

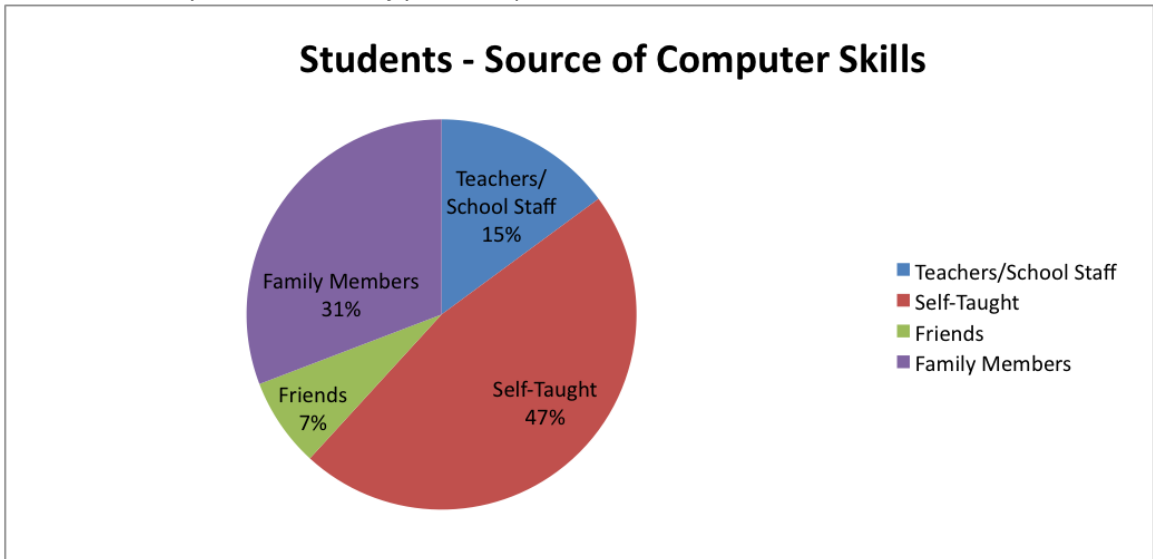


At first blush the data presented in this graph may seem to be at odds with that reported in student question #3 (above) in which 80% of students report using the Internet in the homes of friends and relatives. However, the questions are asking two different things. Even in homes without Internet access it is still possible, even probable in our culture, that 100% of District students are using digital devices at home and it only the mix of devices that is different. On the whole, Americans are adopting smaller, more portable devices at a faster pace than more traditional devices such as laptops and desktop computers.¹⁰

¹⁰ see <http://www.techspot.com/news/50873-tablets-expected-to-outpace-laptop-sales-this-year.html>

5. Who Taught You About Technology?

From whom do you learn most of your computer skills?

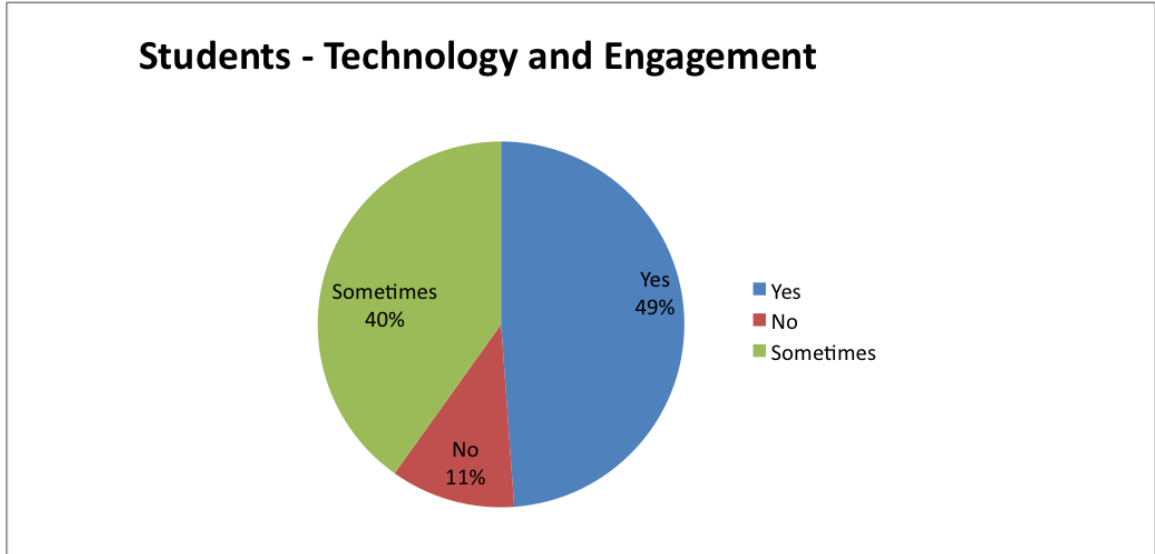


Educators who read this graph and see that students ascribe 85% of their knowledge of technical skills to people other than teachers need not be alarmed that they are not an important part of this learning loop. Knowledge of how to open and close applications, play games, post to Facebook and so on represent skills that may or may not be accompanied by what Mark Prensky calls “digital wisdom.” “Technology alone will not replace intuition, good judgment, problem-solving abilities, and a clear moral compass,” qualities that one often associates with experience gained over time. Prensky predicts the emergence of “digital wisdom,” a marriage of sorts, of “wisdom arising from the use of digital technology to access cognitive power beyond our innate capacity and to wisdom in the prudent use of technology to enhance our capabilities.”¹¹ In short, one of the important roles of educators is to not only broaden the technical skill set of students but to also help them develop a mindful approach to using technology. See Howard Feingold’s Net Smart (ISBN 0262017458) for additional information on mindful computing.

¹¹ <http://taffee.edublogs.org:2009:02:09:will-the-natives-become-wisegals-and-wiseguys>

6. Technology, Interest, and Engagement

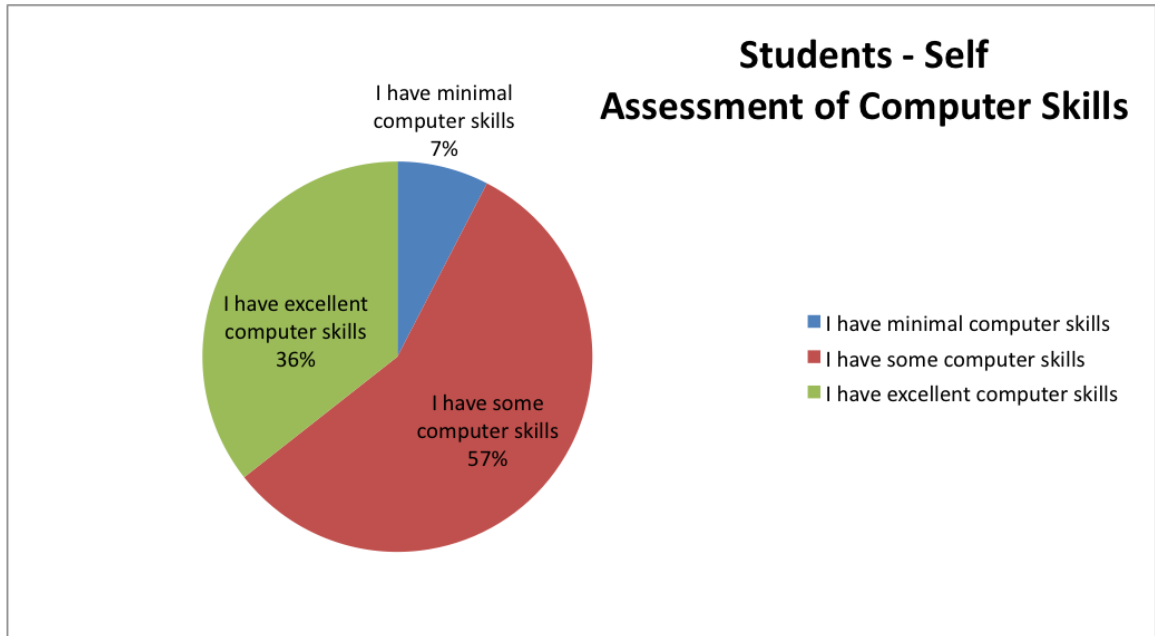
Does the use of computers in the classroom increase your engagement and interest in the subject material?



About half of student respondents report that the use of technology in the classroom increases their engagement with lessons, and 40% report that engagement is “sometimes” increased. This suggests that the strategic and purposeful use of educational technology could have a very positive effect on the vast majority of students.

7. Student Proficiency with Computers

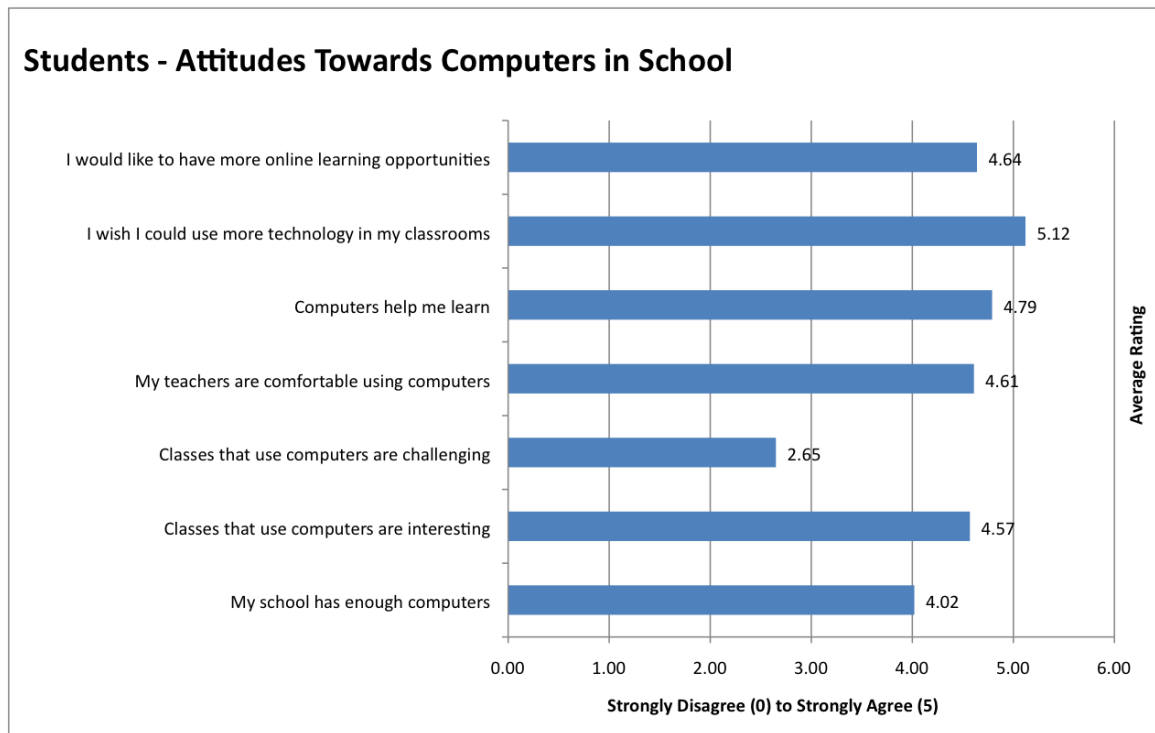
How would you describe your skill level with computers?



Just over a third of students report their computer skills to be “excellent.” An interesting follow-up for the district would be to validate this assertion with specific skills tests based on Common Core or ISTE NETS•S standards and assessments.

8. Attitudes Towards Technology

Please indicate how you feel about the following statements.

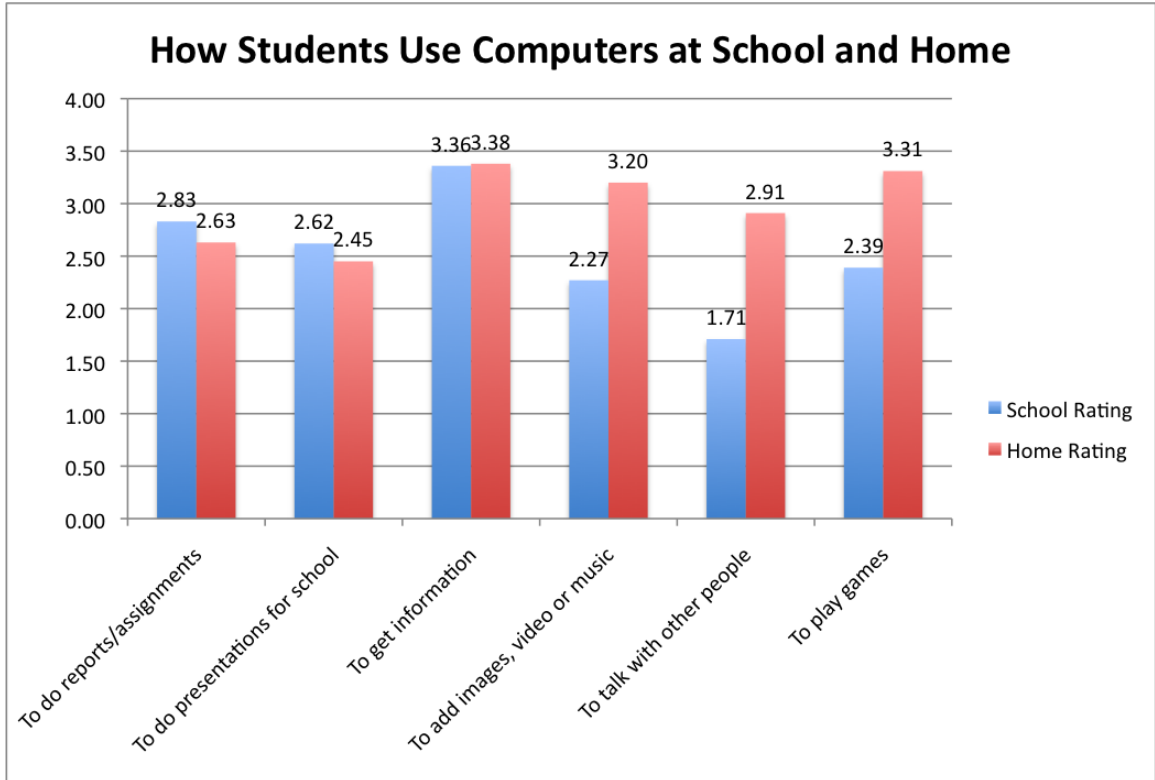


Most students strongly support the use of more technology in their classes. The outlier in this section is “classes that use computers are challenging.” This deserves more scrutiny. One possible reason for this has to do with how technology is used in the classroom. When higher-level thinking skills (Bloom) of analysis, synthesis, and evaluation are engaged, students find classes more challenging. If technology is only used at lower levels of thinking (knowledge, comprehension, application) as with teacher-centric instruction and drill and practice, students are less likely to be engaged in general, even when instruction is computer-mediated.

9. Computer Use at School and Home

At school I use computers...

At home I use computers...

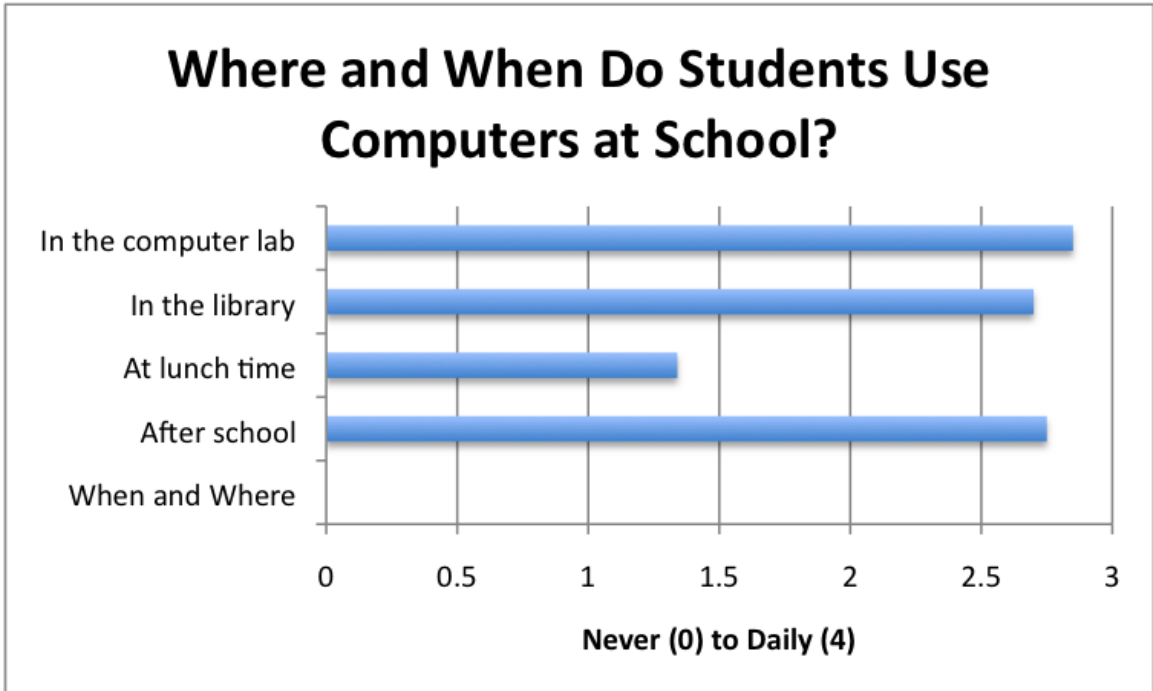


EC combined the analysis of two if these questions to draw attention to how student use of computers differs at school and at home. Readers will note that uses associated with recreational computing increase at home.

This question addresses two different aspects of student use of computers in the District: what do they use computers for and where do they use computers?

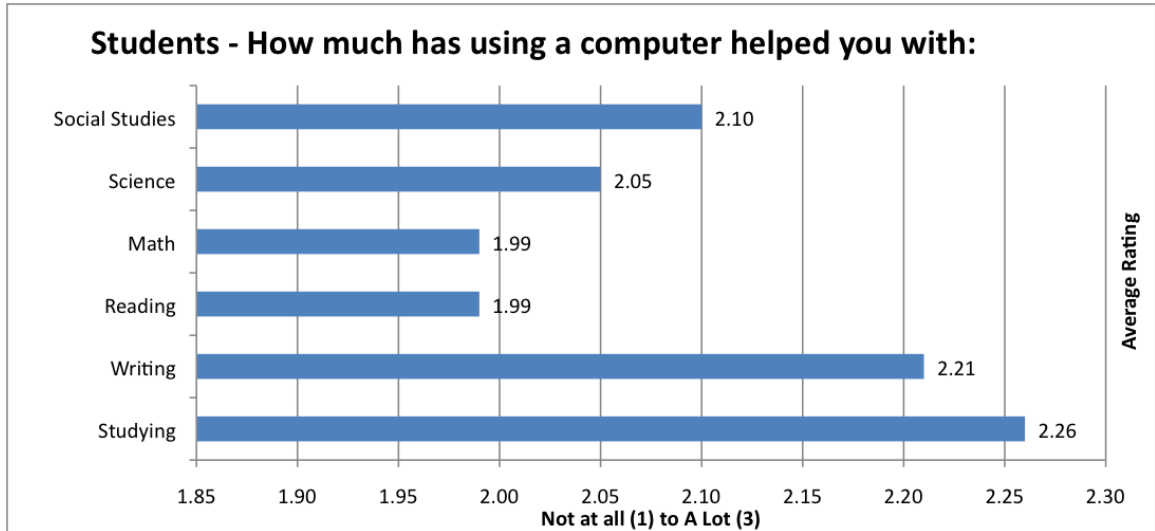
10. When are where are computers used at school?

At school I use computers...



11. Computers and Personal Learning

How much has using a computer helped you with:

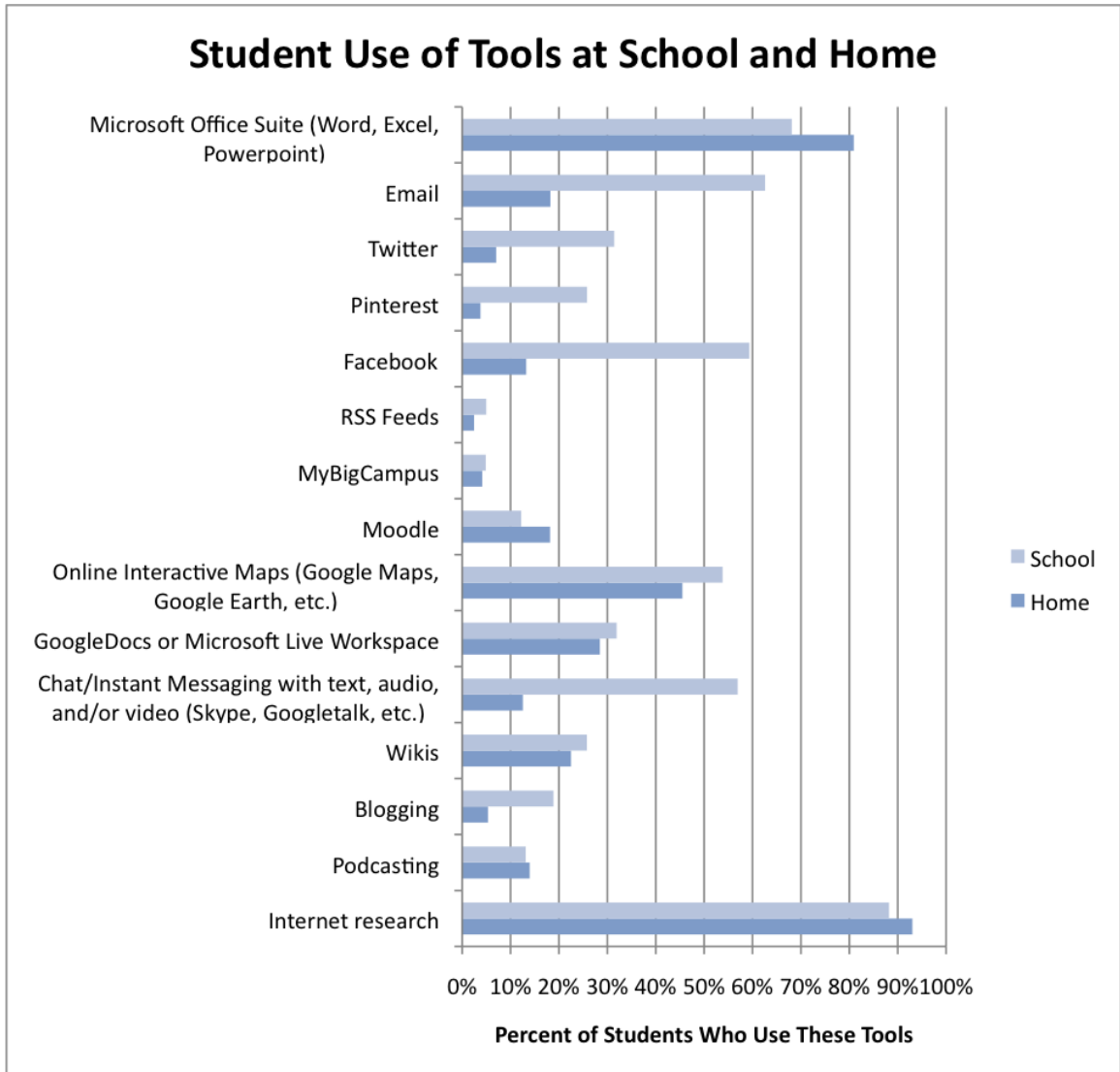


EC lacks the data to correlate use of computers by subject areas with student reports of how much technology is perceived to have assisted in their learning a subject. We find it interesting, however, that the core subjects of math and reading have relatively low scores.

12. Computer Tools and Resources Used at School and Home

At school, I use the following Internet tools and resources:

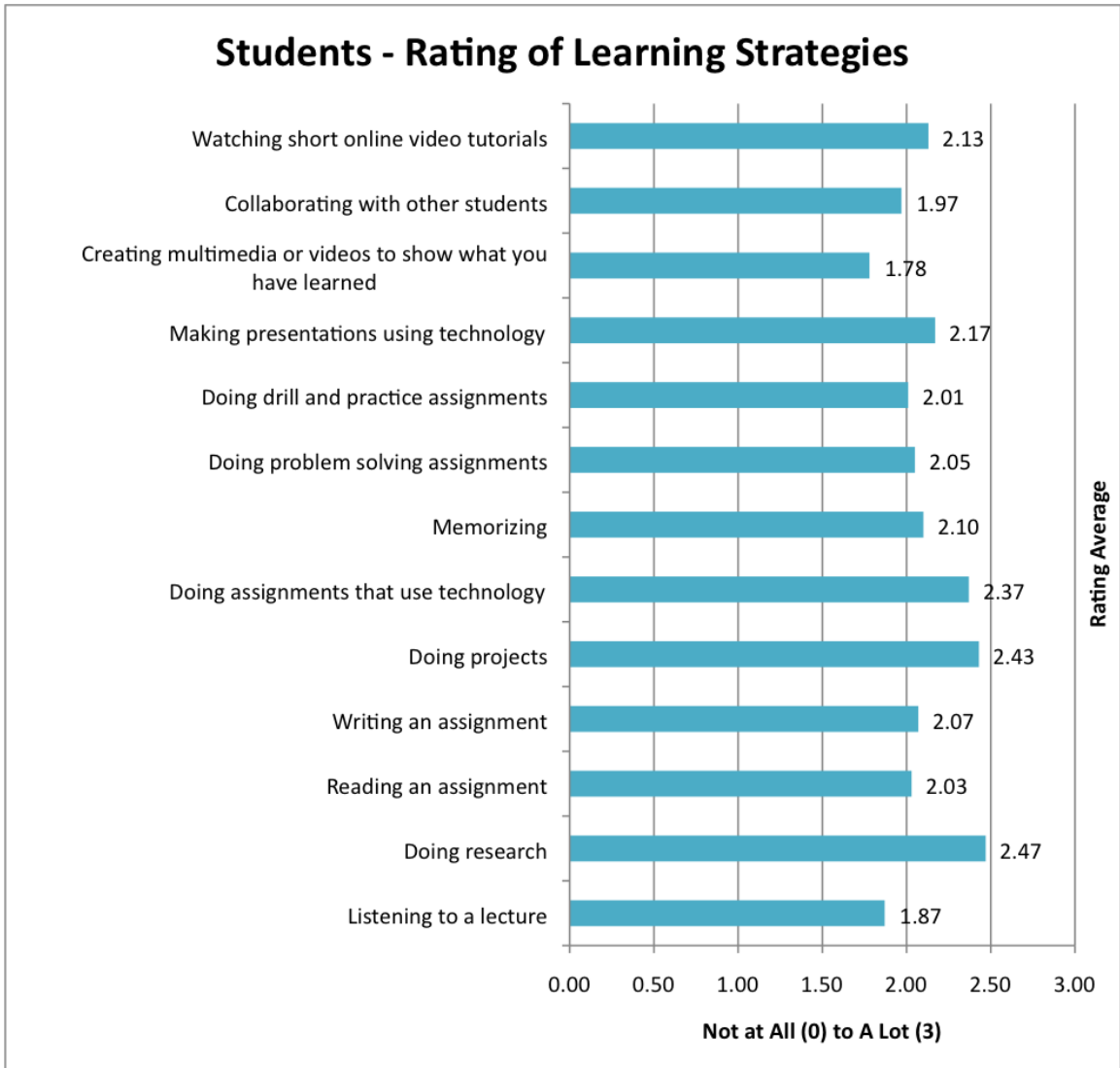
At home, I use the following Internet tools and resources:



The MS Office suite scores high. EC suspects that the highest use is Word, followed by PowerPoint and Excel. This would be a normal pattern in classrooms and offices. Interactive maps also score highly. Perhaps there is an association between this and Question 11's report of high learning in social studies.

13. Computer Personal Learning

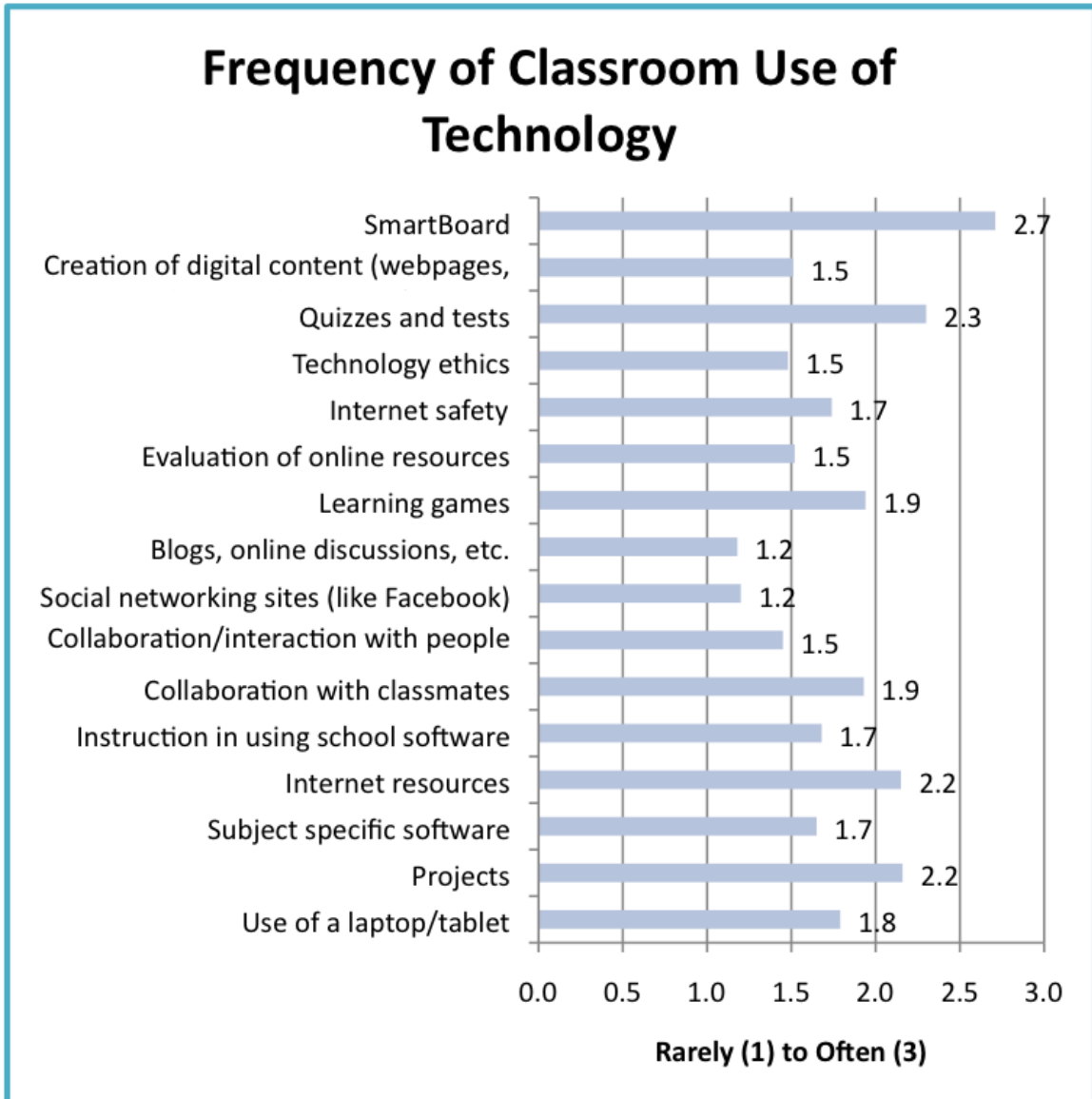
How much do the following strategies help you learn?



Like their teachers, students rate listening to a lecture as their least preferred method of learning. However, students do appear to like using technology in research, project learning and making presentations.

14. Technology Use in the Classroom

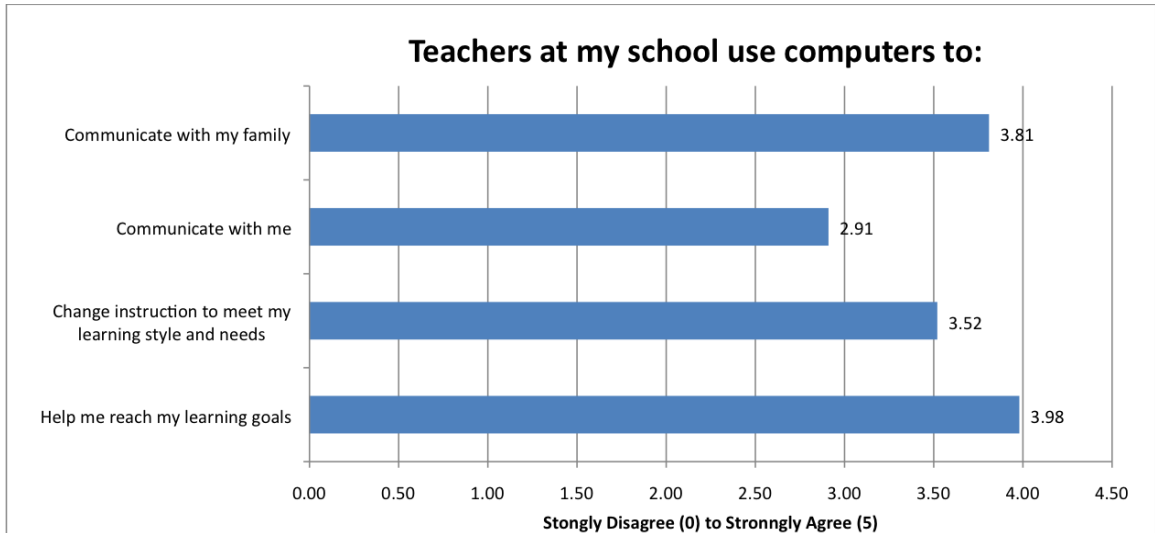
How often are each of the following included in your classes?



According to students, teachers make frequent use of SMART Boards. Interactive whiteboards can be primarily used to support lecture modes of teaching, something that teachers and students rate as ineffective. However, SMART Boards can also play an important role in “flipped” classrooms and for student-driven presentations.

15. How Your Teachers Use Technology

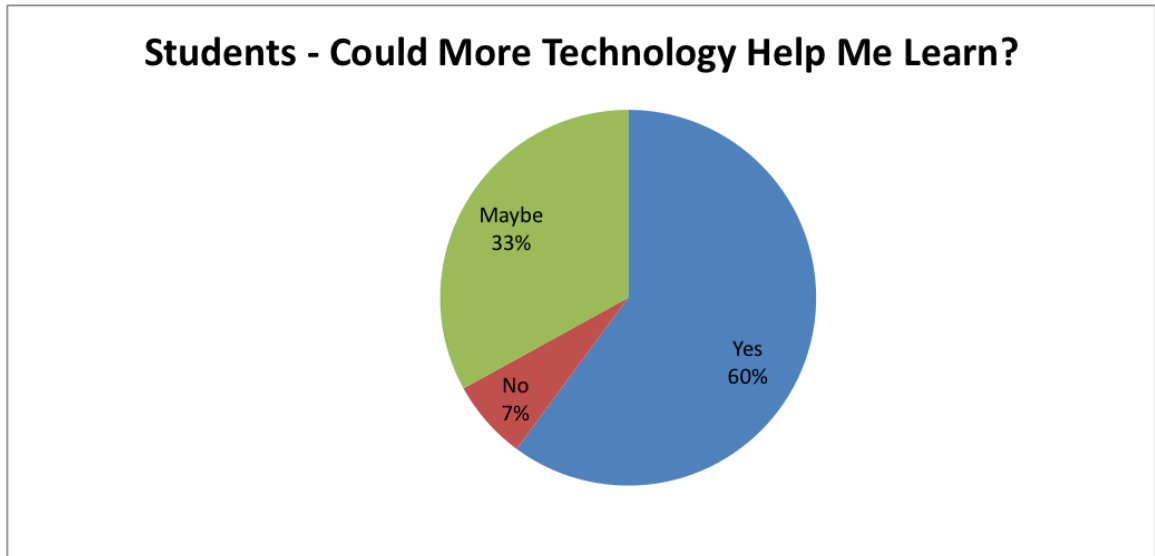
Teachers at my school use computers to:



The use of technology to communicate with students' families outweighs its use to communicate with students. This may be the result of students not having WeBo supplied email accounts, or perhaps students do not consider communication through Moodle or MyBigCampus to be personal communication, but group communication.

16. How Technology Might Affect Your Learning

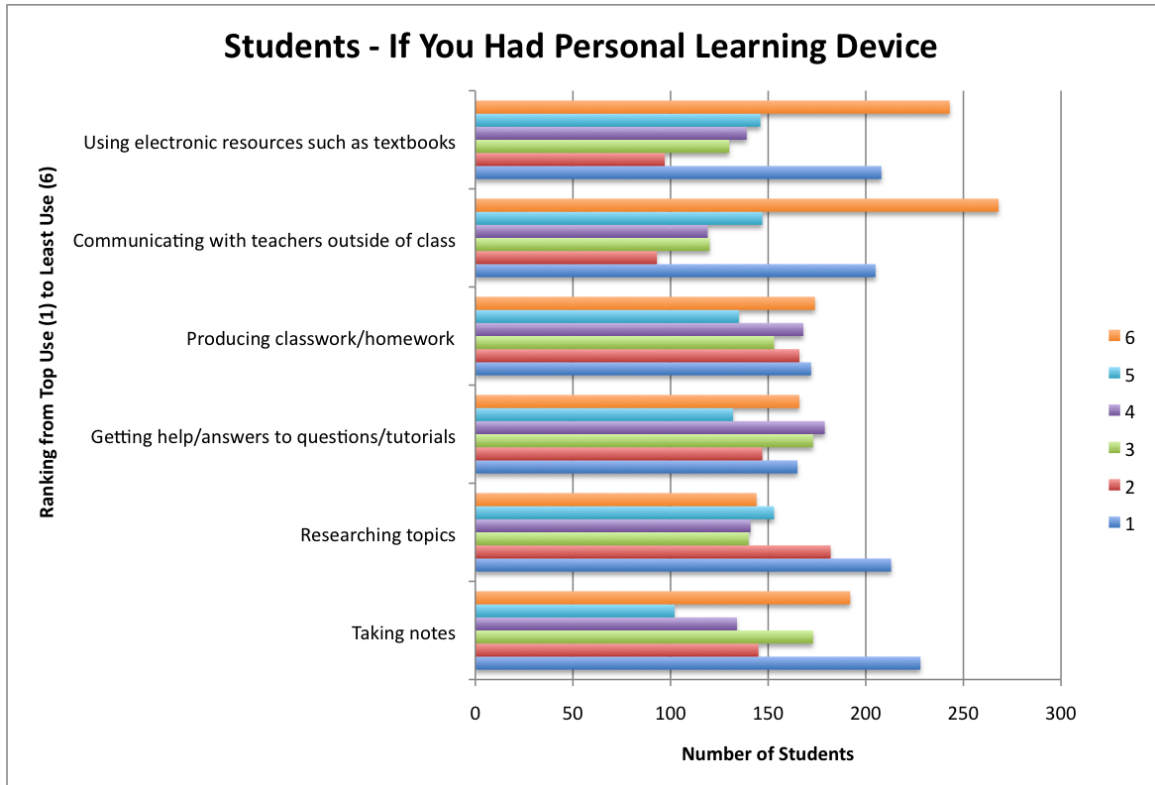
I could learn more in my classes if I had additional access to technology?



A majority of students of students believe that additional use of technology could help them learn. Only a few (7%) suggest that it would not.

17. Choice of Technology for School Use

If you had unlimited access to a device to use at school, rank how you would use it most. Rank your choices from 1 to 6 with 1 = Top Choice. You may only use each ranking once. When completed, you should have used all six rankings (1-6).



Students report that if they had a 1-1 device, they would use it for note taking, research, and communicating with teachers. Interestingly, the highest scoring item was electronic textbooks. Perhaps students recognize that ready access to their textbooks not only lightens the load in their backpacks but that well-written e-texts will also include interactive elements not available in paper texts.