

Basic Technology Survey:
A Protocol for Documenting Educators' Essential Technology Abilities

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The West Rutland School (WRS) in collaboration with the Rutland Central Supervisory Union (RCSU) has begun an initiative to reinvigorate the use of information technology to support teaching and learning throughout the K-12 community (Ackerman, 2007). The leadership team for this initiative is comprised of the technology coordinator, the principal, the superintendent, and a school board member. This group is engaged in a statewide initiative known as Vermont Leadership for Information Technology (VT LEAD IT) (Morris, 2007). Through VT LEAD IT, the WRS leadership team is participating in professional development focused on developing and implementing plans for integrating information technology into WRS.

The VT LEAD IT leadership team concurs with the observation that the effective use of technology in a school depends on the extent to which it is integrated into meaningful learning activities (Jonassen, 2000) and also the team concurs with the observation that the ability to use technology is not sufficient for educators to effectively use technology as an instructional tool (Sandholtz, 2004). While recognizing technology must be used to engage learners, the VT LEAD IT team believes an educator must have a minimum level of competence and confidence using modern technology, otherwise the educators' lack of ability will interfere with the educator's ability to teach using technology.

In addition, the team recognizes the WRS faculty is in general not a group that has adopted technology and there is a large group of teachers who do not use technology for professional purposes (Ackerman, 2007). The VT LEAD IT team concurs with the observation of its member who pointed out "before we ask teachers to use technology in their classrooms, we better tell them what we expect them to be able to do" (J. Bowen,

personal communication, December 12, 2006). All members of the VT LEAD IT team at WRS also have also heard the reasons commonly given by teachers for not using technology in their classrooms such as insufficient preparation and perceived deficiencies in technology skills (Forgasz, 2006) are given by WRS teachers to explain why they do not use available technology.

The current situation at WRS can be summarized as a school in which technology has become increasingly available, but a school in which technology has not become an effective instructional tool. School and technology leaders attribute this situation in part to educators' collective inability to use technology. School and technology leaders believe the school must identify those skills that are essential for educators to demonstrate if they are to be prepared to use the available technology for teaching and other professional purposes. Through the basic technology survey (BTS) described in this paper, the VT LEAD IT team seeks to articulate the technology skills and knowledge necessary for one to work as an educator in the school.

Purpose of the Assessment

Information technology has become widely available in the WRS community in recent years. In December 2003, there were about 75 computer workstations available for students and teachers and several classrooms and offices did not have Ethernet ports; currently there are over 130 computers available for students and teachers and a wireless network available throughout the building. Despite this increase in the technology capacity available in the building, including almost doubling the number of computers available and the installation of wireless networking in the school, computer use in classrooms has not increased (Ackerman, 2007). By articulating the skills and

knowledge WRS school and technology expect teachers to demonstrates, the WRS leadership team plans to take a first step in creating a set of local technology standards for both educators and students.

The need for these local technology standards became clear as the WRS leadership team completed the Vermont Edtech Survey Tool (University of Vermont, 2006-2007) as part of the VT LEAD IT work. Through reviewing the team's responses to the questions on that survey, it became clear that little progress was being made to address the National Technology Standards for Administrators related to the assessment and evaluation of technology in the school (Brooks-Young, 2002). In response, the WRS leadership team decided to "create a set of expectations, starting with basic use, then addressing teaching with technology, always with the goal of supporting learners" (K. White, personal communication, January 12, 2007). The BTS is anticipated to be the first in a series of technology standards with which educators can assess and evaluate the progress made to effectively use and integrate technology in into the WRS learning culture.

The information gathered using the BTS, and subsequent standards, will be used both to inform goal setting by individuals and goal setting for the community. In Vermont, educators' licenses are renewed through a process in which each individual writes personal goals for improving his or her abilities as an educator as well as goals for ensuring he or she is better prepared to support local educational initiatives (Vermont Department of Education, 2005). Using data gathered with the BTS, educators can define professional development goals that align with the expected skills and knowledge related to using technology. Vermont schools are expected to provide professional development

focusing on technology for educators (Vermont Department of Education, n.d.). Using data gathered with the BTS, school and technology leaders can ensure they provide professional development aligned with the personal and school goals of local educators.

Completed the BTS

The BTS will be administered to all educators during the in-service days at the beginning of each school year. By directing educators' attention to the survey early in the school year, school and technology leaders will bring the expectations back to a level of awareness for all educators and also school and technology leaders will gather the information necessary to organize and deliver necessary training early in the school year. Because the BTS will be available on the World Wide Web, the survey will be indefinitely available to be referenced by teachers or school and technology leaders at other times, and the survey can be completed by those who join the staff throughout the school year, and the survey can be used by paraeducators, students, community members, or other stakeholders to assess their technology abilities.

Educators and others will complete the assessment using the WRS Portal (West Rutland School, 2007). This section of the school web site was created using Drupal, an open source content management system that can be used to create dynamic and interactive web sites; and access to that section is available only to authenticated users (Drupal.org, n.d.). Once each user logs on the system, a menu option will direct each user to the survey. Users will select responses to the survey by selecting from options controlled by radio buttons. Once all questions have been completed, users will use a submit button to add the responses to a database. Each individual's responses can be downloaded from the database and the responses of the entire population that completed

the survey can be downloaded as well. The text of the questions to be included in the BTS, the brief rationale given for the questions and the instructions for completing the BTS that will be posted on the web-based survey are included in the appendix.

Skills and Knowledge Assessed

The BTS includes 40 questions divided into categories of technology use that are derived from the National Educational Technology Standards for Students (International Society for Technology in Education, 2000) and the Vermont Edtech Survey Tool (University of Vermont, 2006-2007), and the Professional Competency Continuum (Coughlin & Lemke, 1999). Because the BTS is designed to indicate the level of skill one demonstrates using the information technology systems available in the school, the skills tend to be specific for those systems. For example, one who can use an email account at home, but who cannot use the school email systems is expected to indicate that lack of ability when completing the survey.

Each item on the BTS is presented as a question, and for each question, three possible responses are provided. Although the phrases used to articulate the response are selected to be appropriate for the question, the responses are intended to have similar features. The least level of ability is represented in a response that indicates the educator is unaware of how to perform the skill or is unaware of the expected knowledge. The middle level of ability is represented in a response that indicates the educators can perform the skill or can be demonstrated the knowledge, but with assistance. The greatest level of ability is presented in a response that indicates the skill or knowledge is demonstrated efficiently and independently. Each respondent will define the qualifiers such as assistance, efficiency, and independence for himself or herself.

Using Information Systems at WRS

WRS provides access to several technology systems for educators, these include both local area network (LAN) resources such as file servers and networked printers and Internet resources such as a web-based email account and the WRS Portal which provides several tools for publishing to the web, organizing resources, and communicating both synchronously and asynchronously. Educators at WRS are expected to be familiar with these tools so the tools can be used efficiently and independently. To ensure all educators can demonstrate the skills and knowledge presented in this section of the survey, school and technology leaders anticipate providing on-going training and retraining. Educators new to the school system cannot be expected to be familiar with the skills presented in this section and educators cannot expect to find training in using WRS information systems from other sources. In addition, the skills presented in this section will be updated as the WRS systems are upgraded, modified, and expanded.

Logging on to local information systems. Access to the information technology systems at WRS is controlled with user names and passwords. Currently, access to different systems is controlled by different databases, so educators are expected to recall log in procedures for accessing (a) the LAN, (b) the WRS Portal, and (c) the email system.

Accessing LAN resources. The WRS LAN includes a file server on which users store personal files, users access public read-only files, as well as shared printers that are accessed via the network. Educators are expected to be able to (a) navigate to the file server over the LAN, (b) find appropriate directories on the file server, (c) direct print jobs to the appropriate printer, and (d) find the physical location of the network printers

to retrieve hard copies.

Using the WRS Portal. Much information about school management, technology use and management, and curriculum is available on the World Wide Web using the WRS Portal. Different features on the WRS Portal are added by installing and configuring modules, which provide additional functionality and capacity. Educators are expected to be able to use (a) the blog module to publish information such as homework and classroom news to the web, (b) the calendar module to access to schedule the use of resources such as computer rooms, projectors, and the library, (c) the forums module to engage in professional dialog in threaded discussions, and (d) the questions module to access information about technology troubleshooting and request technology repairs.

Using library resources. The WRS library makes several resources available to patrons over networks; WRS educators are expected to be familiar with those systems to ensure both they use the systems and their students use the systems. The systems WRS educators are expected to use are the Vermont Online Library (VT Online Library Members, n.d.) which is available on the World Wide Web, and Circulation Plus (Follett Software Company, 2007) which is the online public access catalog (OPAC) available on the LAN.

Using the school email system. WRS provides educators with a web-based email account that can be accessed from any computer with an Internet connection and a web browser (Horde Project, 1999-2007). WRS educators are expected to be capable of (a) reading email messages delivered to that account, (b) sending email messages using the system, and (c) opening and sending files attached to email messages.

Policy and procedure. Educators employed by WRS are obligated to follow

school policy related to using information technology; WRS educators are expected to be familiar with that policy and to ensure that his or her actions are aligned with those policies. In addition, WRS educators are expected to be familiar with procedures for using technology in the WRS building, including the procedures for (a) scheduling shared resources, (b) maintaining and protecting information technology equipment in his or her classroom, (c) reporting dysfunctional equipment and requesting technology support, (d) arranging for professional development. In addition, educators are expected to be familiar with steps taken to protect the network system including the Internet content filter.

General Information Technology Skills

Some technology skills necessary for WRS educators are common to all computer users, and these general skills and this knowledge can be developed and practiced regardless of the specifics of the local systems. Whereas training in the use of the information systems specific to WRS must be provided by and for the WRS community, the general technology skills described in this section can be supported with a range of formal and informal, planned and unexpected learning opportunities (Conner, 1993-2005). Whereas educators new to the WRS community cannot be reasonably expected to have skill using systems specific to WRS, educators new to the WRS community can be expected to demonstrate the general technology skills described in this section and to transfer these skills to the WRS information systems.

Managing files. Educators create many digital files that must be saved and accessed later (for example tests may be edited and reused in subsequent school years), educators edit multiple versions of digital files (for example lesson and unit plans that

change over time), and also educators must delete digital files in a timely (for example files containing sensitive data about individual students). Such demands necessitate educators demonstrate skill managing data files. Educators are expected to be able to save, organize, retrieve, edit, and delete files on available operating systems. In addition, educators are expected to be able to use universal file formats such as word processor documents in rich text format (rtf), images in joint photographic experts group (jpg) format, and documents in portable document format (pdf).

Using common productivity suites. Productivity suites include word processors, spreadsheets, and presentation software. Because productivity suites provide similar graphical user interfaces, educators are expected to have skill creating documents for instructional purposes as well as school management purposes (Davis & Bostrom, 1993). WRS educators are expected to be able to (a) create appropriate word processing documents, (b) manipulate and present data in numeric and graphic representations using spreadsheets, and (c) create media-rich presentations.

Accessing resources on the World Wide Web. As the Internet has matured, it has become an important and valuable resource for educators as they seek accurate and up-to-date information to share with students and as they seek information about effective teaching theories and practices (Lewin, 2001). Educators at WRS are expected to be capable of finding, assessing, and using information on the World Wide Web. In addition, educators are expected to be capable of sharing web-based resources with students and colleagues in an efficient manner.

Recognizing the computing environment. Educators frequently find themselves the target of technology marketing efforts; educators are also directed to new resources

by colleagues, or they discover new resources through web searches. When an educator identifies a technology that may potentially be useful, they must be able to determine if technology is compatible with available systems. Educators are expected to be familiar with the operating system including the version used on available computer systems as well as available media players.

Working with digital images. Images are an important part of teaching and learning in the modern world. With cameras and scanners, students and teachers can document classroom activities and illustrate complex ideas, and digital devices make it possible to take pictures of classroom projects with no expense beyond the cost of the camera. WRS educators are expected to be able to retrieve images from imaging devices such as scanners and digital cameras. Although the specific steps for using the scanners and cameras available in the school may require specific instruction, educators can be expected to have an awareness of the steps necessary to take and transfer digital images. In addition, educators are expected to be familiar with image editing tasks such as resizing, cropping, and rotating.

Troubleshooting and repair. On occasion, information technology will stop working as anticipated, and the frequency of those occasions increases as the level of technology support decreases and as the age of technology increases (Fitzgerald & Dennis, 2002). Because educators are expected to use technology and because school technology systems are likely to be ill-supported and old, teachers prepared for the modern world must be able to take initial steps troubleshooting malfunctioning computer systems. In addition educators are expected to be able to accurately and completely describe malfunctioning computers and describe steps that have been taken to resolve

issues to technology support individuals.

Approaches to Using Technology

In addition to demonstrating skill in using technology to create documents for professional purposes and demonstrating skill using information technology to facilitate professional communication and accessing information for professional purposes, WRS educators are expected to use technology in socially responsible and ethical manner and to be a model of active and engaged learning about technology for students.

Copyright and ethics. The modern information and technology-rich world has created an environment in which educators and other technology and media users can easily engage in illegal and unethical activities using technology (Artz, 2003). As model for young people, educators have a particular role in ensuring their actions with technology are ethical and legal. WRS educators are expected to be aware of their emerging rights and responsibilities in these areas of ethical and socially responsible technology including (a) respecting copyrights and following fair use guidelines, (b) minimizing the Digital Divide, (c) taking steps to protect systems and data, (d) understanding the affect of individual actions on shared resources, and (e) understanding the importance and operation of Internet filters and virus protection software.

Actively engaged in learning about technology. Because technology is evolving so rapidly, it is essential that modern educators be actively engaged in learning about emerging technologies the can be adopted and adapted to the problems of teaching, learning and school management (McKenzie 1999). In the RCSU, plans have been developed for providing a range of opportunities for educators to participate in professional development related to using information technology and teaching with

information technology (Ackerman, 2005). WRS educators are expected to be actively engaged in formal or informal learning about information technology.

Conclusion

The BTS is an initial step in the process of assessing and evaluating the use of information technology as an instructional tool at WRS. School and technology leaders will use this tool to support educators as they reintroduce themselves to technology as a viable option for professional communication, and school and technology leaders will use the BTS as a method to communicate expected levels of skill to the community. Over time, the BTS is expected to play an increasingly important role in the school, eventually serving as a tool for staff evaluation, and the BTS will inform the planning and implementation of tools for assessing and evaluating technology-rich teaching. As school and technology leaders continue these activities, the driving goal will always be to support learners; but only through purposeful planning and informed data collection can these leaders identify need and provide support for educators.

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Appendix

The basic technology survey will be delivered using a web-based interface. On that page, educators will choose the one statement that best characterizes their current level of performance in the skill presented as a question. The text that will be used to instruct educators in the completion of the survey along with the brief rationale and the text of the questions and choices are provided below. Because the choices will be presented as options that will be selected using radio button controls on a web page form, the choices are presented here with similar marks indicating each choice.

Basic Technology Survey

In an attempt to both inform educators of the expected level of skill using information technology and also to inform school and technology leaders as they develop plans for supporting educators as they use 21st century tools in our 21st century schools, all educators in the WRS will complete this basic technology survey. For each item, choose the response that most accurately describes your current level of competence and confidence with the skill described in the question.

Using Information Systems at WRS

WRS makes use of multiple systems for accessing information and information technology tools. Assess your abilities to perform these tasks on the WRS systems.

Logging on to local information systems.

- 1) Can the educator log on to the local area network?
 - The educator can log on quickly and independently.
 - The educator needs reminders of user name, password, or log on procedures.

- The educator cannot log on to the local area network.

2) Can the educator log on to the WRS Portal?

- The educator can log on quickly and independently.
- The educator needs reminders of user name, password, or log on procedures.
- The educator cannot log on to the WRS Portal.

3) Can the educator log on to the WRS email system?

- The educator can log on quickly and independently.
- The educator needs reminders of user name, password, or log on procedures.
- The educator cannot log on to the WRS email system.

Accessing LAN resources.

4) Can the educator find his or her directory on the file server?

- The educator can use the file server quickly and independently.
- The educator can access the files server with assistance.
- The educator cannot use the file server.

5) Can the educator find and access shared directories on the file server?

- The educator can use shared directories on the file server quickly and independently.
- The educator can access the shared directories on the file server with assistance.
- The educator cannot use the file server.

6) Can the educator use network printers?

- The educator can independently direct print jobs printers as necessary and can find the physical location of printers in the building.
- The educator can direct jobs to printers and locate printers with assistance.
- The educator is not aware of the location of or names of network printers.

Using the WRS Portal.

7) Can the educator use the blog module of the WRS Portal?

- The educator can efficiently and independently post and manage information on his or her blog.
- The educator can post and manage information on his or her blog with assistance.
- The educator is not aware of blogging features on the WRS Portal.

8) Can the educator use the calendar module of the WRS Portal?

- The educator can efficiently and independently access schedules and reserve resources using the calendar.
- The educator can access schedules and reserve resources with assistance.
- The educator is not aware of calendar features on the WRS Portal.

9) Can the educator use the forum module of the WRS Portal?

- The educator can efficiently and independently engage in professional discussions using the forum module.
- The educator can use the forums with assistance.

- The educator is not aware of the forum features on the WRS Portal.

10) Can the educator use the question module of the WRS Portal?

- The educator can efficiently and independently access information and make requests using the question module.
- The educator can use the question modules with assistance.
- The educator is not aware of the question features on the WRS Portal.

Using library resources.

11) Can the educator use the access the subscription databases available through the WRS Library?

- The educator can efficiently and independently access information using the databases.
- The educator can use the databases with reminders or assistance.
- The educator is unaware of the databases.

12) Can the educator use the OPAC?

- The educator can efficiently and independently access information using the OPAC.
- The educator can use the OPAC with reminders or assistance.
- The educator is unaware of the OPAC.

Using the school email system.

13) Can the educator receive mail using the WRS email system?

- The educator can efficiently and independently receive email.
- The educator can receive email with assistance.
- The educator is unaware of how to receive email.

14) Can the educator send mail using the WRS email system?

- The educator can efficiently and independently send email.
- The educator can send email with assistance.
- The educator is unaware of how to send email.

15) Can the educator send and receive files attached to email messages using the WRS email system?

- The educator can efficiently and independently send and receive attachments.
- The educator can send and receive attachments with assistance.
- The educator is unaware of how to send or receive attachments.

Policy and procedure.

16) Is the educator familiar with policy related to information technology?

- The educator is familiar with policy and takes steps to follow policy.
- The educator is unaware of policy related to information technology.

17) Is the educator familiar with procedures related to scheduling use of shared information technology resources such as computer rooms and projectors?

- The educator follows appropriate procedures independently.
- The educator follows procedures with assistance.
- The educator is unaware of scheduling procedures.

18) Is the educator familiar with procedures related to protecting information technology resources in his or her classroom?

- The educator follows appropriate procedures independently.

- The educator follows procedures with assistance.
- The educator is unaware of procedures to protect systems.

19) Is the educator familiar with procedures for requesting technology assistance or equipment repair?

- The educator follows appropriate procedures independently.
- The educator follows procedures with assistance.
- The educator is unaware of procedures for requesting support.

20) Is the educator familiar with procedures for requesting technology training?

- The educator follows appropriate procedures independently.
- The educator follows procedures with assistance.
- The educator is unaware of procedures for requesting support.

General Information Technology Skills

Some technology skills necessary for WRS educators can be developed and practiced regardless of the specifics of the local systems. Assess your abilities to perform these tasks.

Managing files.

21) Can the educator create, move, organize, copy and delete files?

- The educator can manage files efficiently and independently.
- The educator can manage files with assistance.
- The educator create single-use files.

22) Can the educator create and use universal file formats such as text in rtf, images in jpg, and document in pdf?

- The educator can work with universal file formats efficiently and independently.
- The educator can work with universal file formats with assistance.
- The educator is unaware of universal file formats.

Using common productivity suites.

23) Can the educator create appropriate documents with a professional appearance using the available word processor?

- The educator can create word processor documents efficiently and independently.
- The educator can create word processor documents with assistance.
- The educator is unable to use available word processors.

24) Can the educator manipulate data and present numeric and graphic data using available the spreadsheet?

- The educator can manipulate data and present data efficiently and independently.
- The educator can manipulate data and present data with assistance.
- The educator is unable to use available spreadsheets.

25) Can the educator create appropriate and media-rich presentations?

- The educator can create presentations efficiently and independently.
- The educator can create presentations with assistance.
- The educator is unable to create presentations.

Accessing resources on the World Wide Web.

26) Can the educator locate appropriate information on the World Wide Web?

- The educator can efficiently and independently locate information.
- The educator can locate information with assistance.
- The educator is unable to locate appropriate information.

27) Can the educator assess the credibility of information found on the World Wide Web?

- The educator can independently assess information.
- The educator can assess information with assistance.
- The educator is unable to assess information.

28) Can the educator share information found on the World Wide Web?

- The educator can efficiently and independently share information.
- The educator can share information with assistance.
- The educator is unable to share information.

Recognizing the computing environment.

29) Can the educator identify the operating system of a computer?

- The educator can independently identify an operating system.
- The educator can identify an operating system with assistance.
- The educator is unable to identify an operating system.

30) Can the educator identify available media players?

- The educator can independently identify media players.
- The educator can identify media players with assistance.
- The educator is unable to identify media players.

Using digital imaging devices and software.

31) Can the educator use scanners and digital cameras?

- The educator can independently use imaging devices.
- The educator can use imaging devices with assistance.
- The educator is unable to identify use image devices.

32) Can the educator resize, crop, and rotate images using available image editing software?

- The educator can independently edit images.
- The educator can edit images with assistance.
- The educator is unable to edit images.

Troubleshooting and repair.

33) Does the educator restart a malfunctioning computer?

- The educator always takes this step.
- The educator takes this step when reminded.
- The educator is unable to initiate troubleshooting.

34) Can the educator accurately and completely describes the symptoms of a malfunctioning computer?

- The educator describes symptoms independently.
- The educator describes symptoms in response to questioning.
- The educator is unable to answer questions about malfunctioning computers.

Approaches to Using Technology

Educators are expected to use technology in an ethical manner and also to be active learners about technology.

Copyright and ethics.

35) Does the educator follow copyright laws, including software license agreements, and fair use guidelines?

- The educator follows these guidelines consistently.
- The educator follows these guidelines occasionally.
- The educator is unaware of these limits to media use.

36) Does the educator plan to ensure equitable access to technology for all students?

- The educator plans purposefully and consistently.
- The educator plans occasionally.
- The educator is unaware of necessary planning decisions.

37) Does the educator take steps to protect computer systems, including passwords?

- The educator takes steps to protect systems consistently.
- The educator takes steps to protect systems when reminded.
- The educator is unaware of recommended steps for protecting systems.

38) Does the educator conserve shared resources?

- The educator conserves shared resources consistently.
- The educator conserves shared resources when reminded.
- The educator is uses shared resources without consideration for others.

39) Does the educator understand potential threats to systems and steps necessary to minimize threats, including local actions such as virus scanning software and the Internet content filter?

- The educator conserves shared resources consistently.
- The educator conserves shared resources when reminded.
- The educator is uses shared resources without consideration for others.

Actively engaged in learning about technology.

40) Is the educator actively engaged in learning about and with technology?

- The educator contributes to an active learning culture.
- The educator passively participates in professional development.
- The educator is not learning about technology.