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Removing dust bunnies and expensive paperweights from the classroom : effective staff development in educational technology

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Abstract

With major funding directed toward putting technology in the classroom and training students to be tomorrow's workers, there needs to be an effective technology staff development program in place for the teachers. Developers of staff development programs need to include the learning style of adult learners (andragogy), instead of pedagogy. Successful staff development for the teachers must include innovation, release time, and quality equipment. The learning styles of adult learners should be foremost in the development of courses and workshops. Staff development is more than just the technical side of the technology. It should provide teachers with the tools to develop and implement meaningful, educationally relevant projects into their classroom curriculum.

Removing Dust Bunnies and Expensive Paperweights from the Classroom: Effective Staff Development in Educational Technology

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Abstract

With major funding directed toward putting technology in the classroom and training students to be tomorrow's workers, there needs to be an effective technology staff development program in place for the teachers. Developers of staff development programs need to include the learning style of adult learners, andragogy, instead of pedagogy. Successful staff development for the teachers must include innovation, release time, and quality equipment. The learning styles of adult learners should be foremost in the development of courses and workshops. Staff development is more than just the technical side of the technology. It should provide teachers with the tools to develop and implement meaningful, educationally relevant projects into their classroom curriculum.

Introduction

What strikes terror into the heart of a practicing classroom teacher more than the administrator wheeling a piece of technology into the classroom and announcing that it is to be used effectively tomorrow? Historically, the last century has seen this happen almost every decade. Even as early as the 1800's, classroom teachers were dealing with new technology. Whether technology succeeded or failed was determined by the quantity and quality of staff development provided the classroom teacher.

Teachers are known for their resistance to new ideas and technologies. Some have eagerly embraced technology while others have dug in and fought to the last breath against embracing anything new. Their methods have worked for years and why should they change. Change was difficult and hard for many veteran teachers. They felt threatened and did not see a reason to incorporate the new ideas (McKenzie, 1999).

An in-depth look at the failure of past technologies in education has revealed that in many cases there was little or no staff development presented with new technology or the new technology received no technical support once it was delivered to the teacher (Dockterman, 2002). It has been theorized that once technology was placed in the classroom, the teacher would embrace it and learn how to use it. This theory fell short in practice and now the administration must justify to the public why the funds have been spent on so much equipment and so little results have been produced. Administrators have turned to staff development to yield

results which validate spending money. The staff development has often been inappropriate or severely lacking in quality and practicality such that the results have been to waste more funds on technology. Staff development must be relevant and effectively implemented for the administration to successfully authenticate the need for technology funding.

Methodology

The area of staff development has been placed in the forefront of education today due to the need for schools to become accountable to the American public. In writing about the need to develop good staff development programs, several texts and articles were consulted.

Rod Library at the University of Northern Iowa provided many helpful texts on the adult leaner and adult learning styles. A search of the professional library at Grant Wood Area Education Agency provided up-to-date staff development texts and research studies.

Using ERIC, INFOTRAC COLLEGE EDITION, and eSchool News online services on the World Wide Web, many current research studies and information on current trends in staff development were found. A practical application used in staff development at All Saints School, Cedar Rapids, Iowa, provided a hands-on experience for the author.

Discussion

Definitions

The terms staff development, professional development and inservice education are interchangeably through the literature. McKenzie (1999) said "Training is what we do to

dogs and pigeons" (p. 67). Thus, this research will focus on effective development and not training.

When establishing a pedagogical foundation for efficient staff development, the learning style of the adult learner is most important. The difference between pedagogy (the study of teaching children) and andragogy (the study of leading adults to learning) should be considered when developing courses for adults. Knowles (1980) defined andragogy as the art and science of helping adults learn. Knowles (1980) applied his definition to the adult learner and did extensive research in adult learning. Revised versions of adult learning theory have taken Knowles' research farther and were also examined. Along with learning styles, A. H. Maslow's Hierarchy of Human Needs should be referenced.

In the late twentieth century, new staff development paradigms were developed (Sparks & Hirsh, 1997). These paradigms keep the adult learner's needs in mind and encourage the presenter of staff development to prepare to meet the adult learner's instructional needs.

The characteristics of staff development (Guskey, 2000) are intentional process (clear purpose and goals, worthwhile goals, assessment of goals), ongoing process (not just a few days) and systemic (change over an extended period of time). If these characteristics are incorporated into the technology plan of the organization, they are more effective and the technology plan becomes a working, viable document.

A leading authority in staff development for technology is Jamie McKenzie (1999). McKenzie has spent thirty years in

education. Since 1997, his focus has been on technology planning and professional development. McKenzie stresses that school districts have spent much money on hardware and software issues. He feels that for school districts to maximize their investments, they need to go beyond technology instruction and give teachers opportunities to develop thinking, questioning, and informational skills. Many of his concepts and ideas will be the basis for this paper.

Along with defining staff development, the definition of technology staff development takes the meaning to a higher level. Bailey and Lumley (1994) defined technology staff development as the integration of the emerging technologies into education by using planned, ongoing, and comprehensive approach involving leaders (both administrators and teachers) who facilitate other stakeholders that are actively engaged in acquiring, upgrading, or abandoning knowledge, attitudes, and skills related to technology-based learning environments.

An important part of technology staff development was developed by the International Society for Technology in Education (ISTE) in creating the National Educational Technology Standards (NETS, 2000) for students and teachers (Appendix A). These standards are being required for curriculum development in technology as well as part of staff development content.

Technology integration involves using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways (Dockstader, 2000, p. 35). Integration is not

merely technology equipment in a classroom. It is not software; nor is it teacher created programs that do not fit the curriculum. Integration is using technology to enhance student learning. It is using software that meets real world applications. Technology integration is technology being driven by the curriculum.

Dockstader (2000) listed seven reasons for integrating technology: more depth into content-area curriculum, intrinsic need to learn technology, motivational tool, to lead student learning from knowledge and comprehension to application and analysis, correct search methods, non-isolated computer skills, and to develop computer literacy through applications. These reasons can be effectively integrated into the curriculum by having the skills relate to content area and assignments, and by tying the skills in a systematic model of instruction. Technology staff development should combine these reasons with NETS (2000) for a strong program.

Pedagogy to Andragogy

In the early 1900's there was only one definition for learning. It was pedagogy. Pedagogy was developed in between the seventh and twelfth centuries in monastic schools in Europe (Knowles, 1980). The definition is derived from the Greek words *paid* (child) and *agogus* (leading) to mean the art and science of teaching children (Knowles, 1980, p. 40). The monks devised the term because all their teaching experience related to the education of children. This definition remained constant until the early 1920's when other

disciplines began to explore the learning process. Psychologists, sociologists, anthropologists and gerontologists in North America and Europe began to study educational learning styles and processes. Because they felt the need to label their studies, the European educators turned to the Greek word *aner* (stem *andr-*) meaning "man not boy" or adult to label their theory (Knowles, 1980, p. 42). Thus the word andragogy became known as the art and science of helping adults learn. Knowles (1980) stated that although some studies had shown that andragogy theory could be applied to children, the two theories were two ends of a spectrum of learning.

These researchers also looked at what were the needs and goals of the adult learner. A. H. Maslow created a hierarchical order for human needs (cited in Knowles, 1980). At the bottom of the pyramid was the physiological or survival needs, with the remaining levels being: safety needs; love, affection, and belongingness needs, esteem needs, need for self-actualization. As the learner achieves success on a level, they then move to the next highest level, work for success on that level, and then move similarly up the pyramid. The top level, need for self-actualization, can be used to define an adult as a life-long learner.

This life-long learner has been facilitated through the advancement of technology into education. Teachers are a prime example of life-long learners. The desire to keep abreast of current education trends and requirements for holding a teaching certificate are among the top motivations

of the teacher. Draves (1984) quoted Harry Overstreet's definition of a teacher: "A teacher must be a learner himself. If he has lost his capacity for learning, he is not good enough to be in the company of those who have preserved theirs" (p. 7).

An adult's mental learning state is not a blank chalkboard or an empty pail that is found in a child's mental learning state. The adult chalkboard has many messages on it and the pail is full. Therefore, the staff development is a reorganization of the teacher's (adult) thoughts and skills.

Adult Learner Characteristics

There are four areas of adult learner characteristics that must be taken into consideration when developing adult learning situations (Draves, 1984). These areas are emotional, physical, mental and social. The emotional characteristics of the adult learner include a need for a positive climate and positive self-image. If the learner brings a negative self-image or memories of a disastrous learning situation from the past, it is more difficult for him/her to learn in a new situation.

The physical characteristics of the adult learner are more focused on comfort in the learning environment (Draves, 1984). The adult learner is more responsive to discomfort. If physical needs are met, the learner is more inclined to learn. Temperature in a room, visual requirements, hearing accommodations and comfortable seating should all be considered when setting up a room for optimal adult learning.

Mental characteristics are: a readiness to learn, problem orientation and time perspective (Draves, 1984). Most adults come to staff development ready to learn. There will also be some who are resentful of having to attend or negative in their attitude about staff development. Staff development must be geared to a non-formal academic setting and focus on having the learner in a mind set that takes him/her out of a classroom mentality. Most adults learn in a problem-centered environment. The teacher comes to staff development because he/she desires a solution to a particular problem such as learning how to integrate technology into the curriculum. Adults view time as moving quickly and have constraints that are either personal or work related. They focus on immediate specific learning and not on long-term broad learning. Children feel that time is moving at a snail's pace; whereas, adults are trying to slow time down. The adult learner must be able to juggle multiple responsibilities and demands on time.

Social characteristics are enhanced by the learner's prior knowledge and personal experiences (Draves, 1984). He/She has varying backgrounds and previous schooling experiences that may be either positive or negative. In group interactions, some adults rise to a leadership role, others feel threatened, and some see groups as a medium in which to share knowledge. The adult learner will have a broad range of content perception. He/She may have difficulty divorcing himself/herself from his/her emotional feelings about the

subject. Some will be afraid, others indifferent and others strongly opinionated about the subject.

Along with these characteristics, Merriam (2001) has included new theories that have developed in the last decade. It was proposed that the context in which learning takes place involves race, class, gender, power and oppression, and previous learning experiences. The educator must consider these new theories when dealing with students. Much care must be taken to avoid stereotyping. Lessons must be planned to involve past experiences. Newby, Stepich, Lleham and Russell (2000) point out how important it is to be aware of the learner's needs and experiences when selecting methods, media and materials for a curriculum integration plan. What is done in pedagogy planning may in some cases be applied to andragogy lessons. With the emergence of feminist theory and post modern theory, more attention should be given to including these theories as a part of adult learner's characteristics.

Even when all the adult learner's characteristics are considered and incorporated for in staff development, it is ultimately the individual's responsibility to learn. It is the responsibility of staff development presenter to create a positive environment that meets the needs of the adult learner. Merriam (2001) proposed that the adult learner should be seen wholistically. The developer of staff development needs to consider the wholistical learner's mind, memories, conscious and subconscious, words, emotion, imagination and physical body. This wholistical approach

supports Knowles' (1980) andragogy learning. The adult learner comes with preconceived ideas, experiences, thoughts, attitude and an aging body. The adult learning process is more than acquiring and storing information. The learner must apply that learning into his/her life and interaction with others.

Dick & Carey (1996) developed a systematic design of instruction that keeps the adult learner in mind. When designing staff development programs, the following steps should be followed: analysis, design, and evaluation. In the analysis phase, a needs assessment is conducted to determine the project goal(s), construct instructional analysis to determine what needs to be learned, analyze the learner and write the goals and objectives for the program. In the design of the staff development consider the instructional strategy to be used and what media will best convey the instruction. Finally, the evaluation of the staff development will determine what knowledge the learner as acquired. There needs to be a formative and summative evaluation of both the learner and the instructor and the process.

Draves' (1984) research provides support for Dick & Carey's model. Draves proposed that to measure the success of staff development, one must measure what, where and why. <u>What</u> can measure the cognitive domain, the affective domain and psychomotor skills. These can be measured using a content test, an attitude survey or a rating scale. <u>Where</u> evaluates the natural condition (everyday life, environment) and the artificial conditions (class setting) where the staff

development was conducted. Why is an evaluation taken during the class (formative) or at the end of the class (summative). All measurement devices must have validity, reliability, objectivity, and practicality. Too often staff development does not receive additional summative evaluation as to what happens after the teacher leaves the course or workshop. The presenter never finds out what was done after the presentation is over.

Staff Development Paradigm Shifts

Staff development is undergoing a change or a paradigm shift. The need to replace staff development that has teachers sitting in a room with a lecturer "pouring" information into the teachers and then having the teachers return to their classrooms to put into practice what they heard is paramount. There is no relevance or follow-up evaluation. How does the lecturer know his/her knowledge was truly, correctly implemented or do they even care?

Ann Lieberman, Linda Darling-Hammond and Milbrey McLaughlin (cited in Sparks & Hirsh, 1997) are leading school reformers calling for rethinking professional development. These reformers seek professional development that helps teachers see a variety of ways a subject may be presented to a group of widely diverse learners.

Three ideas that are currently affecting staff development are results-driven education, systems thinking, and constructivism (Sparks & Hirsh, 1997). Results-driven education is based on what is known and demonstrated after being in a program over a given period of time. Staff

development should be evaluated as to whether it alters instructional behavior such that students benefit; not by the number of teachers who attended the class.

Systems thinking involves seeing interrelationships rather than things (Sparks & Hirsh, 1997). This idea can cause unfavorable changes while making positive changes in one small part of the system. Systems thinking requires circular progress rather than straight-line progress. A ripple effect is also created with change within a system. If changes are not made in the entire system, the entire program suffers. For example, if graduation requirements in a subject are changed but there are no changes made in assessment, curriculum, or instructions, the dropout rate may increase. For staff development in system thinking to develop, it must touch all levels of education; i.e., board members, central office, administration, teachers and students.

The third idea is constructivism. The basic idea is that the student is a "thinker, creator, and constructor" (Sparks & Hirsh, 1997). The constructivist staff development program must model constructivist practices. Teachers must become thinkers, creators and constructors in their staff development. Teachers need to become active learners and the staff development must be relevant to their curriculum.

Piercy (2001) provided the results of a San Francisco-based independent research organization. After three years of teachers and students using laptops in Clovis, California, they found that laptops were meeting the learning needs of student and empowering teachers. Teachers now have a tool

that allows them to plan more project-based, constructivist learning. The survey summarized the results as: laptops support the writing process, laptop using teachers use a more active approach to teaching, and teachers feel empowered in their classrooms. Students in this study were able to work cooperatively, explore their learning at their own pace, and do peer-to-peer teaching. Teachers' high comfort level in using technology made these student learning activities possible.

Eleven paradigm shifts. Sparks and Hirsh (1997) present eleven paradigm shifts in the focus of staff development. These eleven paradigm shifts were an expansion of Gall & Vojtek (1994) six staff development objectives. Sparks and Hirsh gave more emphasis to involvement of school or organization importance:

> *From individual development to individual development and organization development.* Many times teachers attend staff development and return to their school to put into practice what they have learned only to find that there is no support from the administration or district. Finally, in frustration the teachers will stop trying to practice what they learned.
>
> *From fragmented, piecemeal improvement efforts to staff development driven by a clear, coherent strategic plan for the school district, each school, and the departments that serve schools.* Often teachers and schools will be influenced by an

educational "fad". Teachers are encouraged to bring in programs that they are not trained to do or do not understand how the program can be used to its fullest advantage. All stakeholders need to see the coherent strategic plan and have extensive training before attempting to implement it into the schools. The staff development should be a means to an end rather than an end.

From district-focused to school-focused approaches to staff development. Ideally each school system should have a wide vision that would allow individual schools to deviate from the district vision to meets the needs of the students in a particular school and yet be in line with the district vision. Some schools have adopted a teacher-to-teacher training program for individual schools where teachers are trained at the district level and then go back to their individual schools and provide on site training for their building.

From a focus on adult needs and satisfaction to a focus on student needs and learning outcomes, and changes in on-the-job behaviors. Often staff development is based on teacher surveys and teacher "wants" to determine what staff development will be offered. Student needs have been often ignored when planning staff development. All too often there has been no follow up evaluations on the staff development to determine if needs have been meet or

if teachers have even bothered to attend the staff development opportunity. With an emphasis on results-driven and systems thinking, districts are now looking at staff development that will meet the needs of what students need to know when they finish their education and also that it is in line with district visions.

From training conducted away from the job as the primary delivery system for staff development to multiple forms of job-embedded learning. Staff development has been often delivered in the form of "go and get". Teachers sit for hours or days and have an expert present knowledge to the teachers. The teacher then goes back to his/her school and puts the knowledge into practice. All too often the money spent is wasted as teachers do nothing with the information received or are frustrated because the technology is not available to them. The results are never expanded or made accountable to anyone. Sparks and Louocks-Horsley (cited in Sparks & Hirsh, 1997) identified five models of teacher development: training, individually guided, observation and feedback, involvement in an improvement process, and inquiry. These models present a platform that makes teachers more accountable for the staff development time and funds that are spent by the district. Learning can be accomplished through action research, observing

peers, participating in study groups or small group problem solving, planning lessons with colleagues, and journal writing.

From an orientation toward the transmission of knowledge and skills to teachers by "experts" to the study by teachers of the teaching and learning processes. Teachers are now taking control of their staff development by establishing study groups about how the human brain learns, cognitive psychology and other methods for improving instruction. They meet as a group before or after school to discuss the research they have found and how they feel they can implement that research into their classroom. This also facilitates the use of peer observations and team teaching or cross curriculum integration. These are an avenue to assessment, reevaluation and reassessment among the study group members and teaching partners.

From a focus on generic instructional skills to a combination of generic and content-specific skills. At one point, staff development was putting all the faculty of a district together to learn generic instructional skills. The general idea being that by presenting the generic to all staff, the staff could then make the generic apply to their particular grade or age group of students. Research proved that staff members could learn more and receive/share ideas with colleagues when

staff development was divided into smaller, homogenous groups.

From staff developers who function primarily as trainers to those who provide consultation, planning, and facilitation services as well as training. To meet the changing needs for staff development, schools now provide for a cadre of "experts" or "trainers" to provide ideas, consultations, plan for development needs and even facilitate at various staff development activities. The developer is no longer in charge of just arranging for an "expert" to come to the staff, set the time and date and have the faculty ready for staff development (pp. 12 - 15).

Cooley (2001) supported this paradigm with a model for "Teachers as Trainers." The model emphasized the use of core team members and proposed that member selection was critical to the process. Members should be master teachers with credibility, have a positive attitude, be adept at problem solving, have excellent communication skills, have a sense of humor, and understand dynamics of change. These core teachers understand the classroom and have more insight into integration than a non-educator technology director.

From staff development provided by one or two departments to staff development as a critical function and major responsibility performed by all administrators and teacher leaders. By removing the responsibility for staff development from the

central office and giving it to the local administrators and teachers, vast improvements are made. This allows the developers to serve on such committees as school improvement or mentoring. They become more preeminent in the system and are able to provide more one-on-one support to the staff.

From staff development directed toward teachers as the primary recipients to continuous improvement in performance for everyone who affects student learning. Research has pointed to support staff (e.g. school secretaries) as often being the first school personnel encountered by students. To make an effective team, all staff must be included in staff development. Administrators primarily were involved in administrative development that had little or no relationship to the staff development teachers were required to attend. Secretaries, central office, bus drivers, cafeteria support staff and even maintenance personnel were not considered to be members of a student's educational team. New approaches are being directed to include the support staff and even members of the board of education or trustees of the school.

From staff development as a "frill" that can be cut during difficult financial times to staff development as an indispensable process without which schools cannot hope to prepare young people for citizenship and productive employment.

> Districts have now begun to look at staff development as an important aspect of the educational year. Instead of hit and miss staff development, whole days are being included in the school year for staff development. Teachers are being given more time to implement standards and benchmarks. They work in teams to develop curriculum and cross curriculum integration. They are getting together in subject groups or age groups to mentor younger teachers and openly discuss any problems or new ideas that they feel might make a difference in the educational process of their students (Sparks & Hirsh, 1997, pp. 15-16).

Dockterman (2002) quoted a report written in 1983 by the government called A Nation at Risk that reported the United States was in danger of losing its prominence in the world. This report caused attention to be focused onto the education world. As one reads a publication or listens to the news, more focus is on assessment and accountability. In order to achieve the required changes, administrators and the public are directing attention toward the teacher and the computer.

Since the early twentieth century, there have been many technologies that were proclaimed as cures for an ailing educational system. Films, radio, television and programmed learning were all professed to aid in the education of students as well as a teacher. Then in the late twentieth century came the computer. It was to be the technology of all

technologies. Teachers would find their profession less tasking and would relieve their teaching load.

Schools plunged ahead and teachers were expected to learn computer skills without much, if any, training (Dockterman, 2002). The first computers required knowledge of programming language and not much software was available. Resentment came as schools spent more money on hardware and little or nothing on teacher training and technical support. As with most of the previous technologies, many teachers refused to use the computer.

The education field has rejected not all new ideas and technologies (Dockterman, 2002). From one-room schoolhouses to graded classrooms, wallless classrooms, constructivism, filmstrips, overhead projectors, ditto machines, photocopiers and chalkboards are among the most significant technical ideas to be accepted by teachers. At first, teachers did not use the chalkboard. Josiah Bumstead wrote a step-by-step instruction book for use of a blackboard, The Blackboard in the Primary School (cited in Dockterman, 2002, p.9). Blackboards were soon an acceptable, well-used tool. It seems that for teachers to use computers effectively, there must be better instruction or training sessions on computer techniques and technology integration.

It is proposed that the reason the chalkboard, overhead, filmstrip, and textbook were adopted for use by the teacher is that these were all devices the teacher used for instruction. The devices were extensions of the teacher in the classroom. "The value of the technology depended on how

it worked in the hands of a teacher" (Sparks & Hirsh, 1997, p. 10).

Access to technology was another factor involved in whether a teacher accepted or rejected the technology (Dockterman, 2002). The overhead, filmstrip and blackboard usually are readily available and more reliable for the teacher. They normally do not required any outside assistance to make them work. Replacing a bulb or repairing a filmstrip could be the most serious technical expertise required and colleges required an audiovisual course for their education majors. One of the complaints of the early film or VCR tape was that teachers did not have access to 16 mm film projectors or did not have a VCR in their homes to preview those materials. Also, most teachers did not have long enough preparatory times to view and make lesson plans for incorporating the film. Lack of preparatory time was also an argument for not using a particular piece of software or computer application.

Computers are becoming more accessible but many teachers have students use them on the side for drill and practice. This is an easy and painless way for a teacher to say they are using the computer (Dockterman,2002). It has been found that if teachers have portable computers, they are more inclined to learn how to use them and use the computer with their classes.

When the public first heard of computers being designed for education, they felt that students would be learning over the Internet, have customized lessons and a perfect

educational environment would result (Dockterman, 2002). Thus far there is no evidence that the idea is close to happening in the K-12 educational world. There are schools in the world with remote access to students but it is not an acceptable practice in every school in the world. Too much brain research shows that students need the daily interaction of teachers and peers. A human is far more capable of assessing students' knowledge and determining the level of educational needs of a student than current computer technologies. The computer is a powerful administrative tool for teachers and can be a useful classroom tool if steps are taken to help the teacher integrate technology into the curriculum. "Quality teaching has a major impact on student achievement. Studies show that a teacher's ability, experience, and education are clearly associated with increases in student achievement" (Sparks & Hirsh, 1997, p. 13).

Technology Developmental Levels

Not only must the creator of staff development be aware of adult learner characteristics and the paradigm shifts occurring in staff development, they must know the developmental level of technology of their participants. An example of an assessment instrument to help determine participants' levels was created by Bellingham Public Schools (1999) and is found in Appendix B. Holland (2001) did a case study in a middle school that was known for its involvement in technology staff development. The results of Holland's survey produced the following descriptions using the Concerns Based Adoption Model (CBAM).

Nonreadiness Level. These teachers were in a small percentage (Holland, 2001). They are resistant to using computers and have little knowledge about them. They are afraid of the technology and ridicule colleagues because they feel computers are a passing fad. At this level, encouragement from the principal and staff development directed at computer basics would be the motivation for pursuing advancement.

Survival Level. These teachers are focused on their own personal technology learning (Holland, 2001). They may be proficient at a program but not comfortable working with students using a computer. They need support as they use a computer in the classroom. Having the support of a technology literate partner, in-house facilitator, and mini technology sessions will help this level grow more confident.

Mastery Level. The teacher is competent in the application they use in their content area (Holland, 2001). They may not be a sophisticated user and may only use one component of the application. A peer-coaching approach may be the staff development tool for these users.

Impact Level. This level finds teachers are working on integrating technology into their curriculum (Holland, 2001). They recognize that the computer is a tool but are still experimenting how to best use the tool. They learn best from a peer partner and mentoring from a technology specialist. They need release time to investigate and observe other classrooms to see ideas in action.

Innovation Level. At this level, teachers are aware of different technology applications as well as how these applications are relative to reaching and learning (Holland, 2001). These teachers have shown a change in the way they teach and relate to the students. This level of teacher receive the most benefit from staff development that connects them with other innovative teachers.

Technology Project Guidelines

McKenzie(1999) specified six guidelines to keep in mind when developing a technology project. First, make learning goals very clear. Technology plans that contain goals that are so vague or unachievable are frustrating. Successful goals should revolve around engaged learners. These learners are responsible for their own learning, energized by learning, strategic, and collaborative. When the learner comes first and technology is viewed as a tool, staff development mixed with curriculum creates a successful program.

Second, identify the classroom opportunities (McKenzie, 1999). Teachers will embrace technology if they see a connection between their work and the tools. Many districts are beginning to develop curriculum that incorporates local, district and state standards as well as technology standards.

Third, provide extended funding and commitment (McKenzie, 1999). One of the greatest causes for failure in technology acceptance is to put all funds into hardware and infrastructure and hope teachers will use it. Districts need to look beyond the hardware and set up resources for the

teachers. Technology trainers, technology cadres, or professional coordinators will ease the inclusion of technology into the curriculum. Another step in planning technology funding is to include replacement costs. Teachers will learn the technology and find themselves outdated in less than three years and then return to the tried and true teaching methods and leave the outdate technology to gather dust. Nothing is more frustrating than to be instructed in the use of new technologies and find that they are not available for use in the classroom. It is a waste of teachers' time and funds for professional development.

Fourth, emphasize robust staff development, adult learning and the creation of a supportive culture (McKenzie, 1999). Teachers need instruction relevant to their classroom and not necessarily how to use a specific application that has no relevancy to their classroom. Providing mentors and coaches will do more to guarantee successful use of technology than a formal application class.

Fifth, combine rich information with powerful tools (McKenzie, 1999). Giving teachers the ability to use technology for authentic projects allows them to engage and embrace themselves into technology.

Lastly, match rigorous program assessment to learning goals and student outcomes (McKenzie, 1999). A successful program must constantly evaluate, revise and reevaluate the learning process. Programs must reflect the assessment outcomes in order to be effective. Teachers and students need

to use assessment to grow and to move forward on the learning path.

McKenzie (1999) stated that "learning digitally will only transform schools and student performance if we make wise program decisions, invest mightily in professional development and emphasize strategic teaching" (p. 11). Any district that does not plan staff development carefully is setting itself on a course for disaster. Funds that are spent on equipment and inappropriate training will bring a district up short when it comes to accountability with its public support. In today's budget shortages and higher tax levies, the public will demand more accountability for the spending of its funds. Along this line McKenzie (1999) also stressed that "professional development is probably the most important ingredient in the technology mix" (p. 17). Districts have seen this all too often over the last thirty years. Expensive hardware and software have been dumped into classrooms without further support and teachers have borne the brunt of criticism because they have not used the equipment. The staff development has either been none existent, poor in quality, or non-relevant to the classroom.

For technology to become a relevant tool in the classroom, the teachers must become more like coaches. They need to leave the stage and step to the side and allow students to become actively engaged in their learning (McKenzie, 1999). Teachers need to move about the room checking on each student's progress. They need to develop leading questions for students to help them direct their

learning experience. Most of all, teachers need to let go of old teaching methods and encourage students to become engaged learners.

Professional development strategy contains five elements: reviewing techniques (create awareness), critiquing video models, practicing techniques, learning from feedback and enjoying support (McKenzie, 1999). Many of these strategies are being put in schools for evaluation of teachers. Video taping a teacher provides a teacher with concrete evidence of teaching techniques and can be used to document good teaching or to provide self-evaluation for improvement. The tape can also be used as a demonstration for beginning teachers or teacher training classes. It can become part of a professional portfolio. Peer evaluations are also a reliable source of opinions. These can provide feedback and strategies for teaching particular lessons.

McKenzie (1999) and Bray (1999) developed ideas and recommended these keys for successful staff development:

> 1) Spend 25% or more of the technology funds on staff learning. Provide 15-60 hours per year per teacher for several years. Spend less on hardware, more on human infrastructure. Design an action plan.
>
> 2) Clarify purpose - problem solving and decision making. Set goals and visions. Identify your needs. Design an action plan.
>
> 3) Replace staff development and training with adult learning. "Training is what we do to dogs and pigeons." Determine what is the current technology status of participants.

Teachers learn when they have a choice. Adult learning is an approach that recognizes that people learn most

energetically when they have options that match their preferences, their style and their interests.

4) Designate student learning as the cause (not application). Skills required questioning, navigation, information literacy, and independent thinking.

5) Address emotions and the challenge of transfer. "The best adult learning programs will place a high priority on developing confidence, comfort, and calm along with competence" (p. 70).

6) Create teams and a culture of "Just in Time Support" no need to wait for next class. One teacher may be good in presentations, multimedia, research, etc.

7) Use surveys and assessments to guide planning provide learning experience by preferences, interests, styles and skill levels.

8) Provide time for invention and lesson development. "Invention is one of the most powerful learning experience of all" (p. 72).

9) Hook the passion of ALL teachers.

10) Persist. Many years, suitable support, follow through, and funding, all these aid the process (McKenzie, 1999; Bray, 1999)

Strategies to promote adult learning are: outline the journey, study groups, technology coaches, technology mentors, workplace visits, tutorials, student aides, help lines, invention sessions, at-home alone (access), summer/weekend reading and distance learning. For staff development to be a success, the program must become a learning culture that fits into the teacher's daily life and not just an instructional session.

The capabilities of the current computer technologies can be compared to the technologies of old. A computer can be

like a chalkboard; it can give students the same information on a screen as on a board. A computer can be like a film projector or VCR in that it can show a video clip or DVD. A computer can also be a coach. It is very patient as it gives repeated instruction, drills students until satisfactory progress is made or reteaches a lesson.

Technology outside the Classroom

There are several operations that a computer can perform for a teacher that work well outside the classroom. Teachers can create grading records for students, use e-mail to communicate with parents and other teachers, create worksheets and electronic lesson plans, create awards, created web pages for students and keep a newsletter online. With access to a laptop, teachers can become more familiar with software and applications that they can use in their classrooms. Most teachers take home papers to grade and lessons to prepare and with a computer they can still do work at home. They become comfortable with their skills and can experiment with the computer at a more leisurely pace.

In 1989 in Australia, (Stager, 1995) laptops were provided to students and teachers at Methodist Ladies' College (independent pre-K-12 school). Using constructivist techniques, teachers were intimately involved in the experience. In some cases a trainer sat in the classroom as an advisor, modeler, or evaluator. At other times teachers went away to "slumber parties" for technology action workshops. At these "parties" teachers brainstormed, developed and shared ideas, and took problem-solving to a new

dimension. The third experience was a Build-a-Book workshop. Teachers encouraged teams of students to take a concept and build upon what they knew or did not know. The teams shared their results with each other and finally developed a class book about their findings. The process developed hypotheses, processes and conclusions.

Out of this project grew several implementations of having laptops (Stager, 1995). The technology was current and relevant. Everyone was able to stay on task and the teacher was in their own environment. Off-site workshops kept the teachers fresh and away from distractions. Not all people learn the same and this approach to staff development reached many more learning styles.

Technology in a Classroom

Technology is only beneficial when it meets the needs of students and facilitates learning. The business world has pushed for schools to teach students computer skills that they could use in the working world (Dockterman, 2002). However, technology changes so rapidly those specific computers or applications will be outdated by the time students reach the business world.

Teachers want students to have skills that make the students thoughtful decision-makers, responsible group members and life long learners. Dockterman (2002) took these goals and grouped them into four categories and then provided examples of what teachers could do to provide computer experience that meets the skills required:

1) Content Acquisition - information to know and remember. Skills would be multiplication tables, alphabet, spelling rules, grammar rules, and historical information. Computer software could provide multimedia slide shows, time lines, *HyperStudio* stacks, *Inspiration* for organization of information, graphing, gaming software that requires recall of information and drama (simulations).

2) Skill Mastery - repetition of skills. Skills would be learning an instrument, math facts, problem solving, reading and writing skills. Software that would be used would incorporate math word problems and reading comprehension skills.

3) Concept Understanding - allows students to create new information. Students would take skills already learned and incorporate them into a new knowledge base. Learning music theory and expanding on a math or science concept are examples of this. Software and classes could provide conversation about ideas, science concepts, math concepts, graphing concepts and geography concepts.

4) Other Good Stuff - "intangibles". These are the skills that everyone needs to learn: teamwork, empathy, understanding, citizenship, civility, communication, and listening skills. The best technology for acquiring these skills is a classroom. Teachers can facilitate class

discussions and guide students in creating cooperative groups (pp. 44-45).

Teachers will not be replaced with computers but if teachers are given training and support, the technology can become a powerful, seamless tool in the classroom and the curriculum.

Evaluating Professional Development

As with any program, staff development needs a strong evaluation component. Guskey (2000) defines evaluation as the systematic investigation of merit or worth. Systematic is a thoughtful, intentional process. Appraisal and judgment are the bases of merit and worth. By applying this definition to evaluation, a more meaningful instrument can be derived. A formal evaluation that gives a true analysis of the program would be beneficial to the board and public when assessing accountability for spending large sums of money on technology. A summative evaluation of the staff development will provide insight into to how the program can be strengthened and if the program meets its specific outcomes.

According to Guskey (2000) valuation should be done for the following reasons: accountability, guide for reform, recognition as a process, and understanding of the "dynamic nature" of staff development. Previous evaluation has not been given much attention because they have focused on "documentation", they were too shallow, and they were too brief. The evaluation often did not address the staff development but rather the presenter.

Several guidelines for evaluating professional development were recommended by Guskey (2000). The first step is to make sure goals are clear. Know where teachers want to be when they finish the program. Next, assess the value of those goals. Do these goals line up with the technology plan and what teachers needs are? The context analysis shows where change is to take place. Be sure of the research of the staff development and estimate if the planned program fulfills the goals established. The evaluator must decide on the method to be used, assess if goals are met or what needs to be done to correct problems. Use formal and informal evaluations to determine how participants received the staff development. Gather evidence of what the participants learned. Obtain information as to whether or not the building administration support the teachers knowledge and were there any indicators of change. Look for evidence that teachers used their new knowledge and where student learning outcomes changed to reflect this new knowledge. Finally, do a summative evaluation of the guidelines and share it with board members, administrators, the developer and the teacher. This document will serve as documentation of accountability for funds spent on technology.

Success with limited funding

After completing and evaluating staff development programs, several keys have been found to encourage staff development with limited funding. Whitehead (2001) summarized these keys: project-based approach, flexible scheduling, "Rule of Traveling Pairs", adult education funds, substitute

rotation, free consulting services, staff development cooperatives and consortiums, school-university partnerships, and community resources.

Several of the keys Whitehead (2001) researched are very low cost. Using community resources (parents) to teach various technology skills, having college students interning in the school and using free consulting services from textbooks and software companies are all at no cost to the organization. Project-based approach, flexible scheduling, presenter stipends (in-house presenters), extended contracts, adult education funds, and substitute rotation are all subject to local controls and budget.

Sharing staff development cooperatives and consortiums, professionally scheduled time and traveling pairs are more district costs and district scheduling opportunities. The advantage can be to bring in nationally known presenters and meet the needs of large groups of participants.

Time

Knowing the adult learner characteristics, the paradigm shifts occurring in staff development, the guidelines for developing technology and evaluating staff development, the final consideration is time. Staff development does not happen in one afternoon. It is proven that teachers (like students) will develop skills at different levels. Anderson (2000) stated that it takes three to five years for a person to move from entry-level usage to the proficient and exemplary levels of technology integration. Once teachers are

comfortable with the basics, the technology becomes a part of their daily life and the usage accelerates.

Conclusion

Designing staff development is very similar to developing units of study for younger students. However, when establishing a program for efficient staff development, the learning style of the adult learner is most important. The difference between pedagogy (the study of teaching children) and andragogy (the study of leading adults to learning) should be considered along with the characteristics of the adult learner. A needs assessment must be done to determine what the staff is in need of in the terms of technology learning. A curriculum should be designed that meets the standards in technology for teachers and administrators. A good assessment tool must also be developed to evaluate the teacher as well as the curriculum. There needs to be room to rework, redesign, and reassess the staff development.

McKenzie (1999) feels the main focus of staff development is providing a learning situation that appeals to the staff. They do not want to be lectured to but rather actively involved in their learning. By actively involving them, they can take the lesson into their own curriculum or lessons that they prepare for their classrooms. The teacher needs to take charge of their learning and see the need or incorporation into their curriculum for staff development to be a success.

One particular quote that McKenzie (1999) gives is: "We need to untie the cart and place it where it belongs...behind

the four horses of curriculum, learning, teaching and exploration" (p. 81). This quote means that technology is not pulling the cart but being included in the curriculum, in the learning, in the teaching and in the exploration by students. Technology should not drive the curriculum nor should it drive the staff development. Instructing teachers in various software packages does not necessarily provide the "how to" of integrating the software into their curriculum. Just because a school has a particular software program for all teachers to use and instructs the teachers in the workings of the software does not mean that the software will make it into the curriculum. The teachers need to see how the software is a teaching tool or teaching aide that helps the teacher administrate their classroom. It can be a grading program, e-mail package, or teaching software that encourages students to use higher thinking skills. The same is true in college preparatory classes. The training students receive should be in terms of curriculum integration and not specific software or hardware. There is no guarantee that when the new teacher is hired, they will find the same equipment or software they learned in college.

When computers were first introduced, they were cumbersome and hard to use. Today the computer is user friendly, more software is gearing toward educational objectives, and districts are recognizing the need for competent teacher staff development.

A teacher has a lot of knowledge to impart to students and often not enough time in the day or too many outside

interruptions that shorten the day. A computer can be a strong, silent ally to the teacher. Just as with students, it sits patiently awaiting instructions. The teacher with proper training can become more productive and have more time to work with students and not be buried under administrative tasks. With e-mail there is an open line of communication twenty-four hours a day. The worry of a note making it home or being intercepted in the "snail" mail is gone. Parents can be reached at work or at home and a password prevents destruction of the note. The telephone is a good tool but often a game of telephone tag is the routine.

When teachers are comfortable with the technology, they will use it. This is evident in the use of overhead projectors and white boards. The mimio board will also become vital when teachers are comfortable and experienced in its use. The "real time" lessons for students who are absent will become only a click away. The mimio board will record the notes of class discussions and can be sent as an attachment to homebound students.

Another point about a teacher being comfortable is that they feel they are on the same level as some of their students. Some teachers do not want to be "shown up" by a student. It is a shame not to take advantage of the knowledge there and make a student feel good about themselves. Perhaps if more students were allowed to impart their technology knowledge in a comfortable way, we would not have the designated "geeks" and then students would be more

self-confident about their ability and not feel as though they are outsiders and need to do something to get attention.

A computer has an advantage over the teacher when it is used as a tool for learning. It has storage space where students can retrieve saved work or teachers can view the saved lesson. The computer can take care of time-consuming tasks such as calculations both for students and the teacher's grading system. Also the computer has a greater memory than a human and has fast recall of information.

In doing staff development, it has been found to be much more successful if the teachers are active participants in their learning experience. Many staff development books provide ideas that can be "tweaked" to meet the need of a particular teacher or perhaps a new approach to an old, outdated lesson. If the teacher creates something that they can use in their classroom, either as a teaching aid or productivity tool, they will become actively engaged. In one school, a staff development project (Appendix C) required teachers to learn how to use digital cameras, a scanner, add clip art to their word processing file and create hot links. Now the school is purchasing four more digital cameras and a digital camcorder to keep up with the teachers' demands. No longer can a teacher count on the camera being available at a moment's notice. By having clip art resources available, teachers are creating newsletters for their classrooms on a weekly or monthly schedule. They can dress up or create a unique design for that particular grade and also include digital images of a field trip that the class took or play

that they acted out in class. Future plans will put newsletters on the school website.

District incorporating the teacher-trainer or cadre approach to staff development are incurring an outlay of funds to hire a substitute for trainers to be gone to classes and then allowing time for the trainers to work with teachers after having attended a training session. They however reap the benefits by having trainers readily available in the building to respond to staff questions and trainers are there to see a need arise for particular staff development. They can offer one-on-one advice, small group sessions, or total school programs.

Many districts have established technology cadres for training their staff in the use of technology. This has an advantage over a single trainer. Cadre members may have breaks at different times so someone is always available to respond quickly to a problem or question. Cadre members can also draw on the different resources each member brings to the group. Some members may excel in software; others are quick to solve hardware problems.

Some of the Area Education Agencies have adopted study groups for re-certification credit. This type of staff development makes the experience more practical and real for the teachers and there are others that they can contact for practical techniques when they return to their respective classrooms. They can also help mentor first year teachers and help the newcomers see how their educational studies can be implemented into a classroom.

Staff development has shown changes in the last decade. The large group sessions where an "expert" lectures to teachers are becoming a thing of the past. There are now smaller group sessions where participants can interact with the presenter, get their hands and minds engaged in activities, and take back to their school a product that they can use. We are also seeing more administrators and support staff at these inservice gatherings. The administration can sit in on various sessions and not be involved in "attendance taking." Support staff can see how various educational strategies can be applied in their area of the school.

The districts have also changed the way they offer staff development. They are trying to align the staff development so that the building faculty can apply knowledge learned to their particular classrooms. Staff development must be part of the technology plan of the building. The plan should be viable and in use, not a stack of papers filed away and pulled out for state examiners. The teachers should not have to attend staff development, that although may be valuable, does not apply to their building.

Staff development needs to be when and where the teachers can access it. Various sources can be in-house, web-based, and on the ICN. If teachers as trainers are sent to workshops, they should go in pairs. They will support each other and can be more effective back in the building. Two people can share the workload easier than one. No one person should possess all the technology knowledge.

After all the research and evaluation of staff development, there are several outcomes. Teachers need more than a single workshop approach. Technology development is life-long learning. Teachers need follow-up to staff development to provide them support in implementing what they have learned. Incentives are a motivation for staff development. It may be time release, monetary or advanced course work. Research has shown that teamwork is important from a training team to teaching partners. Every staff development opportunity needs an effective assessment and from that assessment, accountability can be established. As history has shown there must be appropriate resources for a technology to succeed. Just giving a teacher the resources does not mean he/she will use them. And finally a great benefit to staff development is community connectivity. Connection to parents and businesses creates a strong support for the educational organization.

Providing more thoughtfully-planned and well implemented staff development can help provide a safe, healthy environment for students to learn at their optimal level. Everything that the school community does should have as its final assessment the student. Students are the reason that teachers, administrators, support staff, board members, and even parents need staff development. Gone are the days where a teacher prepares one set of lesson plans and teaches from them for twenty or twenty-five years. Gone are the homes of dust bunnies and the expensive paperweight is now a mobile

laptop hanging from a confident, well-prepared teacher's shoulder.

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Appendix A

ISTE National Education Technology Standards and Performance Indicators for Teachers

I. Technology Operations and Concepts

Teachers demonstrate a sound understanding of technology operations and concepts. Teachers:

A. demonstrate introductory knowledge, skills, and understanding of concepts related to technology (as described in the ISTE National Educational Technology Standards for Students).
B. demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.

II. Planning and Designing Learning Environments and Experiences

Teachers plan and design effective learning environments and experiences supported by technology. Teachers:

A. design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
B. apply current research on teaching and learning with technology when planning learning environments and experiences.
C. identify and locate technology resources and evaluate them for accuracy and suitability.
D. plan for the management of technology resources within the context of learning activities.
E. plan strategies to manage student learning in a technology-enhanced environment.

III. Teaching, Learning, and the Curriculum

Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning. Teachers:

A. facilitate technology-enhanced experiences that address content standards and student technology standards.
B. use technology to support learner-centered strategies that address the diverse needs of students.
C. apply technology to develop students' higher order skills and creativity.

Appendix A (cont.)

D. manage student learning activities in a technology-enhanced environment.

IV. Assessment and Evaluation

Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies. Teachers:

A. apply technology in assessing student learning of subject matter using a variety of assessment techniques.
B. use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.
C. apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning.

V. Productivity and Professional Practice

Teachers use technology to enhance their productivity and professional practice. Teachers:

A. use technology resources to engage in ongoing professional development and lifelong learning.
B. continually evaluate and reflect on professional practice to make informed decisions regarding the use of technology in support of student learning.
C. apply technology to increase productivity.
D. use technology to communicate and collaborate with peers, parents, and the larger community in order to nurture student learning.

VI. Social, Ethical, Legal, and Human Issues

Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply that understanding in practice. Teachers:

A. model and teach legal and ethical practice related to technology use.
B. apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
C. identify and use technology resources that affirm diversity.
D. promote safe and healthy use of technology resources.

Appendix A (cont.)

E. facilitate equitable access to technology resources for all students.

Appendix B
Staff Use of Technology
Self-Evaluation Rubric

Please judge your level of achievement in each of the following areas. Mark the level which best reflects your current skill level. (Be realistic, but compassionate.) The purpose of this instrument is to help you understand your level of expertise and where you need improvement. This will also aid in the development of staff training for the coming year.

Basic Computer Use

___ Level 1 – I do not use a computer
___ Level 2 – I use the computer to run a few specific, pre-loaded programs.
___ Level 3 – I run two programs simultaneously, and have several windows open at the same time.
___ Level 4 – I trouble-shoot successfully when basic problems with my computer or printer occur. I learn new program on my own. I teach basic operations to my students.

File Management

___ Level 1 – I do not save any documents I create using the computer.
___ Level 2 – I select, open, and save documents on different drives.
___ Level 3 – I create my own folders to keep files organized and understand the important of a back-up system.
___ Level 4 – I move files between folders and drives, and I maintain my network storage size within acceptable limits. I teach students how to save and organize their files.

Word Processing

___ Level 1 – I do not use a word processing program.
___ Level 2 – I occasionally use a word processing program for simple documents. I generally find it easier to hand write most written work I do.
___ Level 3 – I use a word processing program for nearly all my written professional work: memos, tests, worksheets, and home communication. I edit, spell-check, and change the format of a document.
___ Level 4 – I teach students to use word processing programs for their written communication.

Spreadsheet

___ Level 1 – I do not use a spreadsheet.
___ Level 2 – I understand the use of a spreadsheet and can navigate within one. I create simple spreadsheets and charts.

Appendix B (cont.)

___ Level 3 – I use spreadsheets for a variety of record-keeping tasks. I use labels, formulas, cell references and formatting tools in my spreadsheets. I choose charts that best represent my data.
___ Level 4 – I teach students to use spreadsheets to improve their own data keeping and analysis skills.

Database

___ Level 1 – I do not use a database.
___ Level 2 – I understand the use of a database and locate information from a pre-made database such as Library Search.
___ Level 3 – I create my own databases. I define the fields and choose a layout to organize information I have gathered. I use my database to answer questions about my information.
___ Level 4 – I teach students to create and use databases to organize and analyze data.

Graphics

___ Level 1 – I do not use graphics with my word processing or presentations.
___ Level 2 – I open, create, and place simple pictures into documents using drawing programs or clipart.
___ Level 3 – I edit and create graphics, placing them in documents in order to help clarify or amplify my message.
___ Level 4 – I promote student interpretation and display of visual data using a variety of tools and programs.

E-mail

___ Level 1 – I have an e-mail account but rarely use it.
___ Level 2 – I send messages using e-mail – mostly to district colleagues, friends, and family. I check my e-mail account on a regular basis and maintain my mail folders in an organized manner.
___ Level 3 – I incorporate e-mail use into classroom activities. I use e-mail to access information from outside sources.
___ Level 4 – I use e-mail to request and send information for research.

Research/Information – Searching

___ Level 1 – I am unlikely to seek information when it is in electronic formats.
___ Level 2 – I conduct simple searches with the electronic encyclopedia and library software for major topics.
___ Level 3 – I have learned how to use a variety of search strategies on several information programs, including the use of Boolean (and, or, not) searches to help target the search.
___ Level 4 – I have incorporated logical search strategies into my work with students, showing them the power of such searches with various electronic sources to locate information which relates to their questions.

Appendix B (cont.)

Desktop Publishing

___ Level 1 – I do not use a publishing program.
___ Level 2 – I use templates or wizards to create a published document.
___ Level 3 – I create original publications from a blank page combining design elements such as columns, clip art, tables, word art, and captions.
___ Level 4 – I design original publications that communicate to others what I've learned.

Video Production

___ Level 1 – I do not use a video camera.
___ Level 2 – I create original videos for home or school projects.
___ Level 3 – I create original videos using editing equipment.
___ Level 4 – I use computer programs to edit video presentations and I teach my students to create and edit videos.

Technology Presentations

___ Level 1 – I do not use computer presentation programs.
___ Level 2 – I present my information to classes or groups in a single application program such as a word processor, a spreadsheet, or a publishing program.
___ Level 3 – I present my information and teach my class using presentation programs such as *PowerPoint* or *AppleWorks* or *HyperStudio*, incorporating various multimedia elements such as sound, video clips, and graphics.
___ Level 4 – I teach my students how to use presentation software. I facilitate my students' use of a variety of applications to persuasively present their research concerning a problem or area of focus in their learning.

Internet

___ Level 1 – I do not use the Internet.
___ Level 2 – I access school and district websites to find information. I follow links from these sites to various Internet resources.
___ Level 3 – I use lists of Internet resources and make profitable use of Web search engines to explore educational resources.
___ Level 4 – I contribute to my school or district website. I teach students how to effectively use the resources available on the Internet.

Responsible Use/Ethics

___ Level 1 – I am not aware of any ethical issues surrounding computer use.
___ Level 2 – I know that some copyright restrictions apply to computer software.

___ Level 3 – I understand district rules concerning student and adult use of e-mail and Internet. I know the programs for which the district or my building holds a site license. I understand the school board policy on the use of copyrighted materials.

___ Level 4 – I model ethical use of all software and let my students know my personal stand on this issue.

Technology Integration

___ Level 1 – I do not blend the use of computer-based technologies into my classroom learning activities.

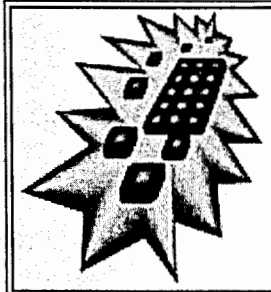
___ Level 2 – I understand the district technology plan supports integration of technology into classroom activities, but I am still learning about what strategies will work and how to do it. I accept student work produced electronically, but do not require it.

___ Level 3 – From time to time, I encourage my students to employ computer-based technologies to support the communicating, data analysis and problem solving outlined in the district technology plan.

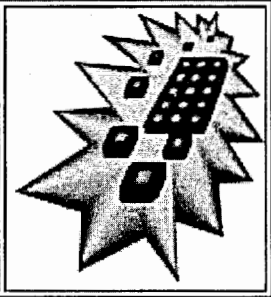
___ Level 4 – I frequently model and teach my students to employ computer-based technologies for communication, data analysis, and problem solving as outlined in the district technology plan.

Appendix C

Chocolate Web Quest



Chocolate Web Quest



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Introduction

You have been asked by a book publisher to write and illustrate a book about:

The History of Chocolate

or

How and Where Cacao Beans Are Grown

or

From Cacao Bean to Chocolate

You don't know much about chocolate except that you like to eat it. You will need to do some research first before you can write your book.

You will use this Web Quest to gather information for the text of your book. You will be adding clip art from the Chocolate CD.

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Task

Your final project should consist of:

A children's non-fiction picture book of at least 8 - 10 half pages that explains "The History of Chocolate", "From Cacao Bean to Chocolate", or "How and Where Cacao Beans are Grown".

A cover page for the book to include the title of your book, your name as the author and a related graphic.

Book pages that each contain at least one fact about the topic and one graphic per page.

A last page that lists a bibliography of the websites you used.

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Resources

http://www.chocolat.ch/chocosuisse.htm (history, composition, manufacture)

http://www.hersheys.com/about/index.shtml

http://www.encyclopedia.com/articles/02114.html (bean to chocolate)

http://www.cadbury.co.uk/ (bean to chocolate)

http://www.ghirardelli.com/ghirardelli/content/AboutChoc/choc_history.html

http://www.ghirardelli.com/ghirardelli/content/AboutChoc/choc_bean.html

http://www.ghirardelli.com/ghirardelli/content/AboutChoc/choc_made.html

http://www.nvogue.com/nVogueFoods/Chocolate/chocolate.htm

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Process

1. Begin by looking at the websites and taking notes on the information you find about your topic or print out the information from the websites and highlight the important and needed facts.
2. Decide what facts and information are important for a K-2 student to know.
3. Arrange your notes into logical order.
4. Decide what one or two facts to put on each page. Write your sentences so that K-2 students can understand them.
5. Type the words in an 18 font size. Be sure to do a spell check.
6. Find and place a related graphic on each page.
7. Design a cover for your book. Include the title, your name and a graphic.
8. Type a bibliography of the websites you used. Use the correct bibliographic form.

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Learning Advice

Keep your notes organized.

Make your book interesting, full of facts, but also fun to look at.

Be sure your graphics support the facts you have on the page.

Spend careful and thoughtful time designing your cover. It is the first thing your reader sees and you want them to want to read your book.

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Rubric

My story board is complete and accurate and accurately shows the outline of my book.	My story board is complete but does not accurately show the outline of my book.	My story board needs some work.
My book is 8-10 pages long.	My book is 5-7 pages long.	My book is less than 5 pages.
Each page contains 1 or 2 facts.	Each page contains 1 fact.	Some pages are missing facts.
My facts are accurate.	My facts need more research	My facts are inaccurate.
Each page contains a graphic.	Each page contains a graphic but the graphic does not relate to the fact.	I need to include more graphics in my book.
My information is in logical order.	I need to reorganize my information.	My information needs work and reordering.
The cover is colorful and makes me want to read the book.	The cover is attractive but I must open the book for more details.	The cover needs more work.
My last page contains a bibliography of the websites I used. The bibliography is in the correct form.	My last page contains a bibliography of the websites I used. The form needs work.	My bibliography is incomplete or missing.
The words in my book are written in complete sentences. Punctuation and grammar are correct.	The words in my book are written in complete sentences. Punctuation and grammar needs work.	I need to write in complete sentences and work on my punctuation and grammar.
The words in my book are spelled correctly.	Most of the words in my book are spelled correctly.	I need to spell check my work.

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Comments may be e-mailed to jmroch@cr-cath.pvt.k12.ia.us

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Author's Note

The Chocolate Webquest is provided with the permission of Julie Mroch, Media Specialist, and Lora Daily, Principal. This webquest was created by Julie and implemented into All Saints School technology staff training in the fall of 2001.