

Staff development for technology is the "Achilles heel" of information technology integration. Too often school leaders presume that if the only get the right equipment, right software, right curriculum the program will fall into place. Research and practice have consistently documented that without effective technology staff development spearheaded by competent educational leadership, that vast investment in equipment and software is wasted. This article provides strategies to implement a technology staff development program.

CREATING TECHNOLOGY STAFF DEVELOPMENT PROGRAMS: A Leadership Perspective

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Everywhere one looks, technology is changing the way we work and live. Everywhere, that is, but in our classrooms. It is clear that schools have failed to join the information revolution that has so profoundly effected other sectors of our society. Schools are in a precarious position because they have not kept pace with technology.

In an information age society we have factory-era schools. In classrooms that could be modern communication centers of learning, the basic media of instruction continues to be chalk boards, teacher talk, and textbooks. While the military, businesses, medicine and science have undergone a technological metamorphosis, education is mired in 19th century curriculum and instruction. If Horace Mann were to walk the halls of a twentieth century school, he would feel at home among the paper, pencils, chalkboards, and textbooks. He would quickly recognize bored students recalling facts from short-term memory, a curricu-

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lum segregated into separate subjects, standardized tests, and teachers being "a sage on the stage" pouring facts into empty vessels. On the other hand, if Horace Mann were to visit a modern factory or hospital, he would feel lost among workers using computers, voice mail, E-mail and Fax machines. In short, education is not "plugged in" to the Information Age.

Many schools aren't participating in the information age because of a lack of staff development in the area of technology. Unfortunately, it is commonplace for school districts throughout the nation to have limited technology-related staff development activities and programs. In May, 1995, *Electronic Learning* surveyed on the nation's schools. They found that 28% of respondents did not spend a single penny on technology-related staff development while the remainder spent less than ten per cent of their staff development budgets on technology.

Some insist that human problems related to introducing technology in the schools are far greater than technical ones. Technology is evolving faster than humans can learn how to use it which has big impact on the culture of the school. This rapid change often leaves educators feeling helpless and bewildered. The fear of technology held by rank and file teachers looms as a significant barrier to successful integration of technology in the schools.

Teachers are key players in the development and implementation of a technology program. They must feel safe to learn and grow in the area of technology. Teacher training in the area of technology assumes a pivotal role in the restructuring of education. People are the most valuable resource when planning for technology and we must invest in them. Simply stated, if successful integration is to take place teachers cannot be passive spectators of technology.

School reformers routinely talk about developing an information-age learning patterns. The problem is that many educators are unfamiliar with what information-age learning looks like. Below are five characteristics which earmark information-age learning:

1. **Time**—people can learn anytime; learning is not confined to time the learner spends in school.
2. **Place**—people can learn anyplace including home, work, school, play, etc.; schools are no longer the learn forum.
3. **Form**—people can access more information from electronic sources; information-age learning does not do away with printed word but is enhanced by using many formats including: graphics, sound, and video.
4. **People**—all stakeholders are seen as learners; students, parents, teachers, administrators, business & industry, and lay citizens are all seen as life-long learners as well as co-teachers of each other.
5. **Knowledge**—knowledge in the information-age is not seen as the same kind of knowledge needed in the industrial era; basic literacy found in the industrial-era is important but information literacy is critical in the information-age; the learner sifts through data to create information; information is used to create knowledge; mastery of information literacy involves accessing, analyzing, applying, and creating information; information literacy is viewed and measured through a lens of multiple intelligences with group and individual performance orientation rather than paper-and-pencil tests.

Busy school leaders often search for help in planning for the technology staff development that is urgently needed to transform schools to the information-age learning model. Leaders must begin the planning process by (1) reviewing characteristics of effective staff development programs, (2) determining staff development areas that will receive the greatest focus, and (3) explore the different staff development audiences that will be addressed.

Twenty-Two Characteristics of Effective Staff Development Programs

There is a body of existing literature which describes effective characteristics of staff development programs which has proven to be crucial in school improvement efforts. These characteristics furnish "snapshots" of what researchers and practitioners have found from past research and "best practices" in the general area of staff development, computer-assisted instruction, and research related to using emerging technologies for instructional purposes.

1. Leadership Commitment and Support

Commitment and support from district (i.e., central office and board of education) and building administrators are prerequisites to effective technology staff development programs. These leaders exhibit initiative, expertise, and concern for others.

2. Comprehensive, Continuous, and Evolutionary Programs

Technology staff development programs are comprehensive in nature; that is, they deal with more than the operation of technology or technical skills. They include training about how to integrate technology into teaching and learning over extended periods of time. There are follow-up activities which monitor progress and build on initial training. The program is open and flexible to allow new developments in the emerging technologies as well as how to use these emerging technologies in technology-infused environments (i.e., access to many different emerging technologies).

3. Preservice and Inservice Connection

The technology training received in preservice and inservice are well connected and coordinated.

4. Restructure or Transformation Focus in a School Improvement Context

A comprehensive technology staff development program focuses on restructuring or transforming education through school improvement. Personal development is seen within the context of school improvement.

5. Partnership Foundation

A comprehensive technology staff development program is a partnership between and among schools, parents, universities, and business and industry.

6. Multiple Participant Incentives

Participants have incentives to participate in technology training such as release time, inservice days, public acknowledgement, stipends, college or district credits, awards, etc.

7. Participant Involvement

Participants receiving technology training are involved in the decision-making process which shapes and molds the staff development program. Meetings are held to deal with teacher concerns and consensus building around the school improvement effort.

8. Recognition

Participants receive recognition for their participation and achievements from a variety of sources: peers, supervisors, parents, school board, and community.

9. The Principal as Learning Leader

The principal is key player in the technology staff development program. The principal supports and advances technology training in a variety of ways: (a) models or uses technology in day-to-day management and learning activities, (b) promotes

technology as a key restructuring and/or transforming tool, (c) recognizes and maximizes staff development opportunities for unlocking the power of the emerging technologies, and (d) participates in the staff development training activities.

10. Governing Documents

The technology training program is guided by a vision and set of core values (i.e., mission statement and goal statements) which are embodied in a variety of belief and policy statements. Governing documents speak directly to leadership, governance, budget considerations, program, and participant accountability. The governing documents provide a legacy for a continuous and uninterrupted, technology staff development program even during changes in administrative leadership at the building and central office level.

11. District and Building Perspective

The technology staff development program promotes a coordinated effort between district and buildings while demonstrating an understanding of technology's growing role in a global society. The technology needs of the district are met as well as the unique needs of teachers, parents, and administrators.

12. Adult Learning Principles and Professionalism

The nature of the technology staff development program recognizes and capitalizes on the learning styles of adults as well as needed training for on-going skill development or continuous growth.

13. Mandatory vs. Voluntary Involvement, Flexible Scheduling, and Options

Participation in school improvement is mandatory but participation in all technology staff development activities is not mandatory. In other words, the technology staff development program provides much flexibility to participants in terms of scheduling and options. While there is flexibility, participants need to recognize that professionalism demands a high degree of commitment.

14. Use of Effective Trainers and Presenters

The technology training program utilizes expertise both outside and inside the system. All trainers and presenters model effective use of the emerging technologies and have credibility with participants.

15. Effective Training Practices

The entire technology training program is based on effective training elements which are linked to everyday practices. That is, the training is connected to what people do on a daily basis. Teachers must see a direct connection to their world. Participants are expected to practice new behaviors in their workplace. Training includes an explanation of the theory, multiple demonstrations of processes and content to be mastered, and opportunities to practice with factual non-evaluative feedback and coaching. Follow-up training is a hallmark of these training cycles.

16. Conducive Learning Environment

The training program is conducted in a positive learning environment within and outside the classroom (e.g., appropriate seating, lighting, wall color, space, etc.).

17. Best Practices and Relevant Research

While the technology training program acknowledges and uses effective school research and teacher effects research (traditional educational research), it relies heavily on "best

practices" (anecdotal information) and research and development (R&D). Technology staff development activities and programs are selected on the basis of "breaking the mold of traditional teaching and learning with technology" rather than selecting "this year's new thing."

18. Risk Taking and Experimentation

The technology training program promotes risk taking and experimentation by all stakeholders—teachers, administrators, parents, business & industry, and trainers. Participants are encouraged to play with the emerging technologies (i.e., a blurring between fun and work) and using the emerging technologies to redefine teaching and learning.

19. Program Material Characteristics

Materials which facilitate participant training activities and outcomes are readily accessible and assist participants when direct, personal contact with trainers is impossible or inconvenient. These technology training materials are clear, detailed, and sequenced to match participant interest and skill level.

20. Meets Individual Needs

Programs and activities are geared to meet needs and interests of participants. Interests and skills range widely: nonusers (technophobes and those who do not have access to technology), moderate users, to high-end users (technophiles).

21. Accountability

Program evaluation includes both formative and summative measures. Participant evaluation is based on more than participant performance (classroom or school performance) and student achievement (i.e., norm-referenced and standardized tests). Program effectiveness is determined by multiple criteria and standards reflective of our Information-Age (i.e., authentic assessment, electronic portfolios, world-of-work competencies). In short, 21st century standards should be applied when evaluating the program rather than 19th century standards.

22. Cooperative Work Relationships.

Participants work with and learn from each other in training sessions. They are rarely isolated or required to work independently since team relationships are paramount to redefining teaching and learning—the essence of school transformation.

There are many components of an effective technology staff development program. While no single program has all of these characteristics, effective technology staff development programs have many of these characteristics in common. When developing an effective technology staff development program, school leaders should draw on these characteristics to shape and structure the program.

Four Staff Development Initiatives That Should be Addressed

School leaders often struggle with where to begin in technology training and what areas should receive the greatest focus. Leaders should begin by viewing training through a district-wide lens at four major technology initiatives (program offerings). These initiatives represent critical areas of focus when integrating technology into education and include: (1) administrative productivity, (2) curriculum production, (3) teaching & learning, and (4) school restructuring/transformation. The following definitions provide a more detailed explanation of the four district-wide initiatives:

1. **Administrative Productivity**—*organization and individual efficiency through technology.* Participants use the emerging technologies to enhance or transform the following processes: (1) communication, (2) budget or purchasing, (3) record keeping, (4) personnel, inven-

tory, (5) transportation management, and (6) food management. Remember that administrative productivity is designated for all program participants—not just administrators (e.g., teacher productivity by using electronic grade reporting).

2. **Curriculum Production**—*creation and modification of learning materials.* Participants use the emerging technologies to enhance or transform the following processes: (1) technology-based curriculum review (i.e., selection of software, databases), (2) technology-based curriculum development (i.e., creating products using technology tools and applications), (3) technology-infused environments (i.e., massing the use of emerging technologies in one location for multiple users), (4) library automation, (5) curriculum resources (guide development (i.e., creating electronic curriculum access), and (6) school improvement research (i.e., collecting and analyzing data electronically).
3. **Teaching & Learning**—*process of redefining role of teacher and student where teachers are facilitators of students who are actively engaged in functional literacy as well as information literacy learning.* Teachers and administrators explore the following transformation concepts as they use the emerging technologies: (1) guide-on-side, mentor, co-learner, evaluator and co-evaluator, and learning leader. (2) student learns with teacher by focusing on functional literacy concepts (academic basic skills), emerging technology skills, technology-based learning methods (e.g., electronic cooperative learning, electronic collaborative learning, multimedia, distance learning, virtual reality, and (3) information literacy (i.e., accessing analyzing, applying, and creating information electronically).
4. **School Transformation**—*fundamental or radical redesign of teaching and learning which addresses the underlying causes, rather than the symptoms, of low quality education.* Participants explore the form and function of schools, teachers, and students. Education is redefined with the emerging technologies. For many technology visionaries, this initiative is synonymous with "anyone learning anything, in any form, anytime, anyplace."

In effective technology staff development programs, the four initiatives are always **balanced or rotated**. That is, each of the four initiatives are explored in significant depth. Some schools will deal with these initiatives simultaneously while other schools will concentrate on one initiative before moving to the next.

All technology staff development programs are not well balanced. Due to lack of insight or proper planning, many schools often allow dominance of technology basic skills or one program initiative dominating all other program initiatives.

After the decision has been made as to which district initiative should receive immediate attention, school leaders should aggressively plan for teacher training sessions on basic technology skills.

Basic Technology Skills

It is important to remember that basic technology skills embraces all emerging technologies—not just computers. Basic technology skills training can be organized into six discrete categories. They include: (1) computer operation and word processing, (2) emerging technologies, (3) spreadsheet construction, (4) data base construction, (5) networking, and (6) visual-audio data processing (e.g., graphics, video, sound).

The following definitions provide a detailed explanation of the basic technology skills which need to be offered in a training program:

- 1) *computer operation and word processing*—skills related to turning computer on and off, printing, routine procedures of computer navigation, etc. as well as the art of entering text and manipulating text-based documents. This competency can be described in terms of a user's ability to "crunch words."
- 2) *emerging technologies*—skills (in addition to the computer) which involve the operation of interactive videodisc player, modem, videotape recorder, audiotape recorder, television, FAX, CD-ROM (compact disc read only memory), satellite, LCD panel (liquid crystal display). This competency can be described in terms of a user's ability to "navigate electronically."
- 3) *spreadsheet construction*—skills related organization of numerical information into ledger-like electronic forms for analysis and calculation. This competency can be described in terms of the user's ability to "crunch numbers."
- 4) *database construction*—skills related to the construction of an aggregation of data together with a collection of operations that facilitates searching, sorting, and recombining activities. This competency can be described in terms of a user's ability to "crunch data."
- 5) *networking*—skills related to communication with others on computer network, and connection of teachers to major databases inside and outside the school. This competency can be described in terms of a user's ability to "communicate electronically over distance and time."
- 6) *visual-audio data processing*—skills related to using sound, video, graphics, text etc. (i.e., HyperCard™, HyperStudio™, LinkWay Live™). This competency can be described in terms of a user's ability to "crunch pictures, sound and text."

As these programs are offered, technology leaders need to remember that program participants may already have these skills. Participants should be offered training in technology basic skills **only as long as an individual or program needs exist**. All participants need to have a working knowledge of the basic skills before becoming heavily involved in the technology program initiatives which represent the rooms found in the technology staff development program.

After school leaders have examined characteristics of effective staff development and begun identifying which program area(s) to focus on first, they should decide how much of the technology staff development program should be dedicated to the classroom teacher as opposed to other audiences such as administrators, school board, and support staff, etc.

Identifying the Audiences for Staff Development

An effective technology staff development program has many different audiences. In an ideal sense, classroom teachers, administrators, board of education members, substitute teachers, support staff, and parents should be targeted for the technology staff development program. In practice, however, teachers are usually the primary participants in the technology staff development program. This "practical mind set" of seeing teachers as the primary target is what most of us bring to technology staff development programs.

Typically, we think the teacher is the only person that impacts learning is classroom teachers. However, we know from personal experience and research literature that many other individuals (e.g., administrators, cooks, janitors, parents, siblings) play key roles in student learning. It is all of the stakeholders in the school district or building that impact student learning!

Let's take a look at some of the key players that should be considered when building a technology staff development program:

Superintendent

Most agree that the superintendent is and should be a key player in transforming education through the emerging technologies. Yet, most of us hesitate to include this individual in the technology staff development program.

The presence and participation of the superintendent in technology staff development activities sends a strong message to all other stakeholders. Yet, effective superintendents have always attended staff development programs. This is especially true for technology staff development programs since the superintendent is or should be the primary visionary of the program.

School Board Member

Few technology staff development programs make formal provisions for school board members under the district's staff development umbrella. However, in most successful technology staff development programs, the school leaders have included, updated, or communicated with the board of education at critical junctures in the program.

Staff development opportunities must be made available to board members to insure that they are prepared to carry out their responsibilities as leaders in the school district.

Building Level Administrator

The building principal is a key player in school transformation process. Without doubt, he or she is a key person in making change happen at the building level. But like the superintendent, most of us would hesitate to make substantive provisions for this individual in the technology staff development program. The fact remains that the presence and leadership of the building principal is critical to any staff development program.

Parents

Traditionally, staff development programs have been designed for one group of individuals—teachers. Ask any teacher who has the most influence on students as a learners and that teacher will tell you—parents. Parents are crucial to the support necessary for their children's understanding of technology-based learning. Further, without effect staff development for information technology parents are likely to retreat to the education they understand—one driven by available technologies when they attended school.

Support Staff

Typically, support staff such as secretaries, bus drivers, custodians, cooks are the last group of people we would think of as primary stakeholders in the technology staff development program. Yet, personal experience and research tell us that these are key people in the success of an educational program.

For example, how many stories have you heard about the custodian who either "made or broke" an innovative project by the way the chairs or room were arranged? For a second example, consider who a community member makes contact within the district or school if they have a question about what is going on in the school. Do they go to the superintendent, principal, or teachers, or do they communicate with support staff? Our experiences tell us that they communicate with support staff because community members feel more comfort with people who are like them. We believe support staff are **key** individuals in a technology staff development program.

Library Media Specialist

The library media specialist plays a primary role in the technology staff development program. The media/library specialist's role, needs, and expertise should be carefully integrated into the technology staff development program.

Classroom Teachers

After considering the previous stakeholders, the primary players can and should be considered—the **classroom teacher**. The primary purpose of considering the previous groups is to recognize that the classroom teacher is not the sole person responsible for learning in the classroom. Yet, it is equally important to recognize that the teacher's success is dependent on the stakeholders found in any school district or building.

Summary

Creating a technology staff development program is not an easy task. Understanding the characteristics of effective staff development programs, determining staff development prior-

ities, and targeting different audiences are three critical steps found in technology staff development leadership. Change is gradual and difficult process and can never be considered a one-time event. Constructing a technology staff development program is similar to the early American pioneers who charted unknown territory. They relied on existing maps but were not afraid to create new maps. Modern school leaders who design technology staff development programs, like their ancestors, are truly first-wave pioneers.

References

1. Bailey, Gerald D. & Lumley, D. (1994). *Technology staff development programs: A leadership sourcebook for school administrators*. New York: Scholastic.