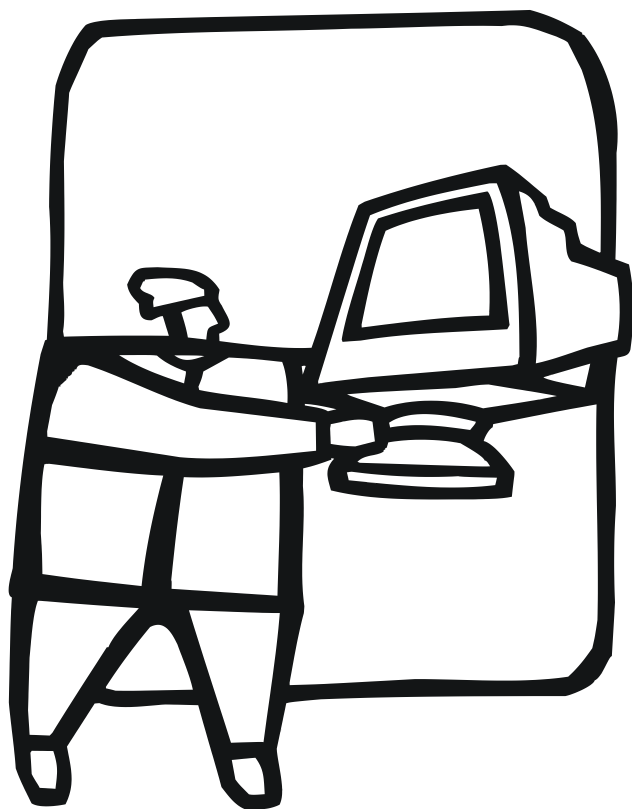

Technology-Mediated Professional Development Programs for Teachers and School Leaders

BY JASON N. ADSIT



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INTRODUCTION

This paper presents and examines the latest research on technology-mediated professional development (TMPD) programs, a small but growing (Claudet, 2002b; Ellett, Annunziata, & Schiavone, 2002; Fontaine, 2002; Hawkes, 2000b; Lepard, 2002; Marx, Blumenfeld, & Soloway, 1998; Newton, Oswald, & Stuart, 2002) segment of the much larger movement to reform professional development programs for PK-12 teachers and school leaders. Technology-mediated professional development (Russell & Sabatini, 2001) uses various technologies to facilitate educational programs for teachers and school leaders.

The paper is divided into four sections. The first provides a definition of TMPD, discusses the technologies covered by the definition, and presents an overview of the basic TMPD formats. The next two sections review the current research on TMPD programs for teachers and school leaders. The final section identifies a set of guidelines for assessing TMPD programs.

DEFINITIONS AND BACKGROUND

For the purposes of this paper, TMPD is defined as professional development that incorporates technology (e.g., computers, Web-based resources, or digital video) as a primary design, delivery, or support component. In TMPD, also known as computer-mediated professional development (Fontaine, 2002), technology is used to help facilitate instruction, but the actual content of the program is not necessarily related to technology (Graves & Kelly, 2002; Schrum, 1999).

Technology professional development (TPD) programs, on the other hand, focus primarily on the development of specific technology skills (e.g., developing classroom Web sites or learning how to set up an electronic database of student information) (Wang, 2000) or strategies for incorporating technology into the teaching-learning process (Sandholz, 2001; Schrum, 1999). Based on these definitions, TPD programs may be considered a subset of TMPD programs.



Technologies Covered by the Definition

TMPD programs or workshops can incorporate a variety of different technologies based on the needs of the participants, the program content, and the available technology infrastructure. The technologies covered by the TMPD definition range from low-tech/low-interactivity media to more sophisticated high-tech/high-interactivity packages (National Staff Development Council & National Institute for Community Innovations, 2001). Table 1 offers a basic list of the various technologies covered by the definition.

Types of TMPD Programs

There are three general types of TMPD delivery formats: workshops, blended programs, and digital programs. In workshops, participants meet face-to-face with presenters or facilitators, and various technologies are used to deliver or support the program. In these contexts, technology helps enrich the training by providing participants opportunities for hands-on work with teaching and learning software packages, digital collaboration forums, and Internet research sites.

Table 1. Technologies Covered by the TMPD Definition

Low-tech/ Low interactivity	Medium-tech/ Medium interactivity	High-tech/ High interactivity
Basic productivity software (word processing, spreadsheets) Static electronic documents (workshop handouts, newsletters) Instructional videos (DVD or VHS) Audiotapes	E-mail discussion groups Listservs Electronic message boards and bulletin boards Text-based or static Web sites	Interactive Web-based programs (e-learning platforms) Live, online chat/discussion groups Interactive digital media (CD-ROMs, streaming video) Handheld technologies (PDAs, Pocket PCs) Teleconferencing/two-way digital video

Blended TMPD programs include both a face-to-face (or workshop) component and a digital (or online) component. The digital component of the blended TMPD program may be employed at the front end (e.g., in order to disseminate workshop materials before the face-to-face meeting) or used after the workshop as a means of extending or continuing the meeting’s activities. Blended models may also use technology during the meeting itself (e.g., using open chat/discussion forums or electronic feedback mechanisms during the workshop) as an adjunct to the front- or back-end support.

Digital TMPD programs differ from both workshop and blended models in that they have no “physical” component. They may instead provide electronic interaction via Internet video or teleconferencing and usually employ a Web-based interface for all program activities. Table 2 outlines the general types of TMPD program formats.

TMPD PROGRAMS FOR TEACHERS

In recent years there have been numerous calls for the reform of teacher professional development (Darling-Hammond, 1997; Darling-Hammond & McLaughlin, 1995; Hawley & Valli, 1999; Lewis, 2002; National Commission on Teaching and America’s Future, 2003; Wilson & Berne, 2001). Teachers need ongoing, high-quality professional development that offers relevant, evidence-based materials for improving teaching, learning, and student outcomes. Unfortunately, research shows that most professional development programs are still rooted in the isolated-workshop model, ill-suited to the reality of classroom practice (Gross, Truesdale, & Bielec, 2001).

The research also shows that in most cases, professional development programs still rely on what Hawkes (2000b) calls a “deficit model of knowledge” (p. 268). Outside experts are brought in to lecture and “instruct teachers in new modes of working with students” (p. 268). In these top-down, lecture-based contexts, teachers have little, if any, opportunity to collaborate, share experiences, and build new knowledge bases. As Soloway, Krajcik, Blumenfeld, and Marx (1996) point out, it is difficult to foster real teacher change using only “traditional top-down models of dissemination and enhancement that rely on one-shot workshops, distribution of curriculum materials to be used exactly as prepared, and lists of prescribed practices to be implemented” (p. 273). Instead, professional development programs must be understood as “social collaborations” (Marx et al., 1998) that provide teachers with access to robust peer-support networks.

Table 2. General Types of TMPD Program Formats

Workshop programs	Blended programs	Digital programs
Face-to-face meetings facilitated using various hardware and software technologies	Face-to-face meetings combined with digital/ online learner support <ul style="list-style-type: none">· front-end model· infusion/combination model· back-end/follow-up model	Interactive, Web-based programs (e-learning platforms) Two-way digital video platforms Teleconferencing platforms

With these issues in mind, new models of professional development have attempted to harness the power of computers and Web-based technologies to foster the following:

- Teacher change and improvement (Ellett et al., 2002; Marx et al., 1998; Soloway et al., 1996)
- Collaboration and community-building (Hawkes, 2000a; Moore & Barab, 2002; Schlager, Fusco, & Schank, 2002)
- Professional development reform efforts (Gross et al., 2001; National Staff Development Council & National Institute for Community Innovations, 2001; Wang & Hartley, 2003)

A growing body of evidence points to benefits of TMPD programs:

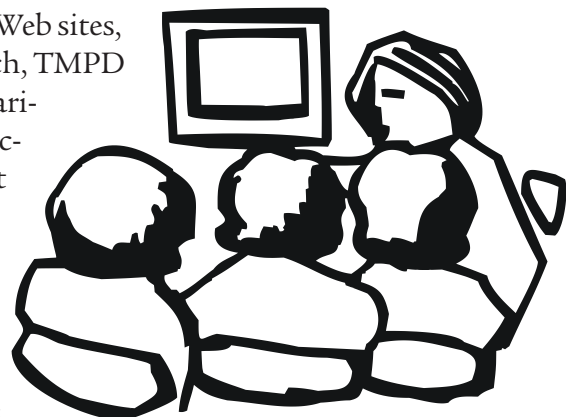
- Reduced teacher isolation
- Access to a broad range of resources for improving teaching and learning
- Opportunities for collaboration and professional growth

Reduced Teacher Isolation

In several studies (Dimock & Rood, 1996; Hawkes 2000a; Jinks & Lord, 1990; Ruopp, Gal, Drayton, & Pfister, 1993), researchers found that access to an electronic communication network was instrumental in reducing feelings of isolation for teachers who otherwise might not have access to a larger peer network. In another set of studies (Merseth, 1991; Roddy, 1999), researchers found that electronic communication networks were particularly valuable for providing teachers, especially beginning teachers, with emotional, moral, and professional support.

Teaching and Learning Resources

In addition to exposing participants to content-area Web sites, electronic databases, and online educational research, TMPD programs can also expose participants to a wide variety of practical resources for improving teaching practice and student learning (Goldman, 2001). Lampert and Ball's (1998) research on Web-based case libraries and classroom video shows how digital technologies can facilitate reflection on teaching practice and serve as models for improving mathematics instruction. In another study, Newton et al. (2002) describe how a Web-based course



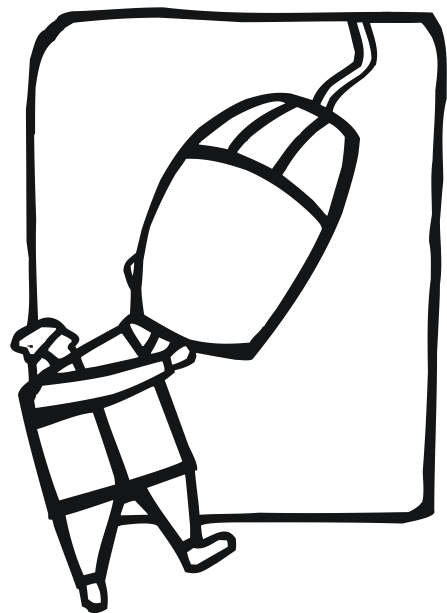
provides language arts teachers in Ohio with access to a database of standards-based model teaching practices. Teachers in Miami-Dade County, Florida, use a Web-based program (PACES—The Professional Assessment and Comprehensive Evaluation System) that offers a “contextually based, learner-centered, classroom observation and assessment system” (Ellett et al., 2002, p. 65) to help conduct annual evaluations and develop plans for professional growth. In these cases and others, digital technologies provide more than just access to resources. They give teachers useful tools for viewing, analyzing, and improving actual classroom practice.

Opportunities for Collaboration

A number of TMPD programs, including TAPPED IN (Fusco, Gelbach, & Schlager, 2000; Schlager & Schank, 1997; Schlager et al., 2002) and the Inquiry Learning Forum (Moore & Barab, 2002), have successfully developed teacher-driven and teacher-supported collaborative networks. Recognizing that professional development, and learning itself, is a social practice, researchers and TMPD designers sought to apply the latest advances in technology to design, build, promote, and foster online communities where teachers share ideas, experiences, and best practices (Goldman, 2001).

TMPD PROGRAMS FOR SCHOOL LEADERS

School leaders’ preparation and professional development programs are now experiencing many of the same demands—and changes—as teachers’ programs. An estimated 60% of all principals will need to be replaced in the next 5 years (Peterson, 2001). The organizations that design and



deliver professional development for school leaders (including schools of education, state education agencies, district offices, and professional associations) are faced with the task of increasing the pool of new leadership candidates while still maintaining the highest standards in their preparation programs. These organizations are under considerable pressure to provide training for current and future school leaders that is sustained, collaborative, standards based, and focused on improving student achievement (National Staff Development Council, 2000, 2001).

A number of organizations have sought to meet this challenge by using technology as a primary design, delivery, and support component (Van Patten & Holt, 2002). Although the research on TMPD programs for school leaders lags behind that on teachers’ TMPD programs (Chance, 2000; Claudet, 2002b), the preliminary findings show that technologies such as Web-based courses and modules (Browne-Ferrigno, Muth, & Choi, 2000; Chance, 2000), vid-

eos (Lepard, 2002), and multimedia case-simulations (Claudet, 1997, 2002a; White, Crooks, & Melton, 2002) can be employed to support and enhance the preparation and professional growth of school leaders in three critical areas:

- Fostering collaboration
- Providing opportunities for reflection on professional practice
- Providing opportunities for the development of technology leadership skills

Collaboration

A rich body of literature attests to the importance of collaboration in the professional development of school leaders (National Commission on Teaching and America's Future, 2003; National Staff Development Council, 2000; Sergiovanni, 1995). To grow professionally, school leaders need access to mentor and peer networks for sharing ideas, concerns, best practices, and support. However, the demanding schedules of school leaders offer little time for attending traditional seminars and engaging peers. A number of organizations (e.g., EdTech Leaders Online; Teaching Matters, Inc.; the University of Colorado at Denver's Administrative Leadership and Policy Studies program) have sought to overcome this difficulty by offering programs that incorporate online or distance-learning components.



In an analysis of the University of Colorado at Denver's Administrative Leadership and Policy Studies program, Browne-Ferrigno et al. (2000) found that participants in a blended (i.e., a combination of face-to-face and online) course used Web-based discussion and file-sharing programs to conduct "rich, dialogue-like exchanges" (p. 48) about professional practice and school leadership. Browne-Ferrigno et al. also found that a blended TMPD program was far more active, robust, and effective than a similar program that was conducted solely online. This finding suggests the need for more comparative research on blended versus fully "digital" models of professional development (King, 2002; Sandham, 2001).

Reflection on Professional Practice

In addition to fostering collaboration, meaningful professional development provides opportunities for reflecting on real-life cases of administrative practice (Ashbaugh & Kasten, 1993; Gupton, 2003; Sergiovanni, 1995). In an analysis of the Professional Enhancement Program (PEP), Lepard (2002) found that video technologies and computerized assessment systems can be powerful tools for fostering reflection. The PEP is a multistate leadership development program designed around the standards of the Interstate School Leaders Licensure Consortium and the National Policy Board for Educational Administration. A central part of the program involves videotaping each participant as he or she performs a series of administrative tasks such as engaging in group problem-solving discussions or presenting an oral report to a school board. Each videotaped segment is assessed by a peer or partner who is charged with documenting performance outcomes using a series of computerized forms and rubrics.

One of the more technologically rich programs for fostering reflective decision making is the Administrator Case Simulation (ACS) Multimedia Library (Claudet, 1997, 2002a). Using the latest Web and digital video technologies, the ACS Multimedia Library aims to offer school leaders "a dynamic and interactive digital platform for self-assessment and professional learning" (Claudet, 2002a, p. 31). Each case in the library highlights "real-world organizational dilemmas" (p. 31) that might confront a school leader, such as issues of equal access and student rights; the need to develop inclusive, equitable learning environments for all students; and dealing with teachers' resistance to change. Using a Web-based interface that incorporates a range of textual, graphic, and video databases, the program offers participants a variety of tools for reflecting on practice, assessing performance, and identifying areas for professional growth.

Developing Technology Leadership Skills

School leaders play a crucial role in the integration of technology into the curriculum (Paben, 2002; Slowinski, 2000; Technology Standards for School Administrators Collaborative, 2001). School leaders make strategic decisions about the purchase of technology. They are also expected to have a vision for teaching, learning, and administering with technology (Creighton, 2003). Until recently, however, most educational technology training opportunities—and funding opportunities—were designed for teachers (Holland & Moore-Steward, 2000). Moreover, in those cases targeting school leaders, the context of the technology training (e.g., the workshop or seminar) was often qualitatively different from the context of application (e.g., the district or building level). This hindered the school leaders' ability to transfer and apply the technical skills to administrative practice.

To address this problem, a number of organizations have sought to develop technology leadership skills in technology-rich environments. One promising initiative is the Technology for Principals Leading Utah Schools (T-PLUS) program (Eastmond & Garlett, 2002). Western Governors University (WGU), through grant funding from the Bill & Melinda Gates Foundation and the state of Utah, designed the T-PLUS program to help school leaders learn how to effectively integrate technology into the curriculum. The program offers both face-to-face workshops and self-paced, online course modules in two topic areas: technology implementation and leadership with technology. Each module is designed to help participants learn how to identify the essential elements of effective technology-integration programs and develop skills for implementing robust technology plans at the district or building level. Participants in the program are also required to complete the Gates Foundation's TAGLIT (Taking a Good Look at Instructional Technology) Survey. The survey is designed to help school leaders “gather, analyze, and report information about how technology is used for teaching and learning in their schools” (Cory, 2001). Upon program completion, participants receive an “Advanced Certificate in Technology Leadership” from WGU as well as 20 relicensure points from Utah's Educator Licensing Division.



The Information Environment for School Leader Preparation (IESLP) is another program that aims to help school leaders develop skills in technology-rich environments. The IESLP is a Web-based instructional program designed to help rural school leaders learn how to manage, analyze, and use data for making decisions about school reform and improvement. After reviewing the program, Chance (2000) found that it not only helped participants gain new skills for engaging in data-driven decision-making, but also facilitated an increase in participants' overall comfort level with technology, particularly with spreadsheet, database, and online-research applications.

GUIDELINES FOR ASSESSING TMPD PROGRAMS

In a recent study of the professional development literature, Guskey (2003) concluded that “there is little agreement among professional development researchers or practitioners regarding the criteria for effectiveness in professional development” (p. 17). This is not surprising, given the “multiple and highly complex” (p. 19) social, political, and economic factors that influence professional development programs.

The evaluation of TMPD programs presents two additional difficulties. First, one must consider the technological factors that influence the design and delivery of TMPD programs and the extent to which these factors help or hinder the teaching-learning process. Second, most TMPD programs have been implemented only recently, and substantial formative and summative data on their impact are lacking. Given these difficulties, defining the “essential characteristics” of effective TMPD may not be a reasonable goal; instead this paper offers a set of guidelines and questions for conducting a general assessment of TMPD programs (see Table 3):

- *Program Design*—To what extent does the program incorporate the latest professional development research and standards?
- *Impact*—What evidence is there to show the program’s impact on teaching, administrative practice, and student achievement?
- *Buy-In*—What evidence is there to show that the program was well received by teachers and/or school leaders? How many people participated in the program? How many completed the program?
- *Sustainability*—How long has the program been in place? What are the program’s prospects for future expansion?

Program Design

A successful TMPD program is designed on the latest research on professional development, employing the best available knowledge in its implementation. As Guskey (2003) noted, there is a considerable body of research in the area of teacher and school leader professional development. Numerous national organizations as well as independent researchers (e.g., Hawley & Valli, 1999) have developed detailed sets of guidelines and strategies for designing professional development program models.

A successful TMPD program also incorporates the latest local or national professional standards and technology standards. These standards should not only inform the general design of the program but also help structure the program’s delivery, content, and expected outcomes.

Impact

In addition to alignment with standards and research, a successful TMPD program has mechanisms and instruments for evaluating its impact on teaching, administrative practice, and student achievement. A program’s impact on practice may be assessed in terms of both qualitative and quantitative measures for program participants. The TMPD program should also be evaluated on the extent to which the program can be tied to subsequent gains in students’ learning, involvement, and test scores.

Buy-In

The target audience must “buy in” to and participate in the program if it is to be successful. Buy-in may be measured by comparing the number of people who registered for the program with the number of program completers



Table 3. General Guidelines for Assessing TMPD Programs

Category	Considerations	Examples/evidence
Program design	<p>To what extent does the program incorporate the latest professional development research?</p> <p>To what extent does the program incorporate national, state, and local standards?</p>	<p>Alignment with professional development standards such as those of the National Partnership for Excellence and Accountability in Teaching</p> <p>Alignment with professional standards such as those of the National Staff Development Council and the Interstate School Leaders Licensure Consortium</p> <p>Alignment with technology standards such as the National Educational Technology Standards, Technology Standards for School Administrators, and National Staff Development Council/National Institute for Community Innovations E-Learning Standards</p>
Impact	What evidence shows the program's impact on teaching, administrative practice, and student learning?	<p>Qualitative evidence such as teacher and/or school leader self-reports</p> <p>Quantitative evidence such as increased student test scores</p>
Buy-in	<p>Was the program well received by teachers and/or school leaders?</p> <p>How many people completed the program?</p>	<p>Qualitative evidence such as teacher and/or school leader self-reports, exit interviews, and course/workshop evaluations</p> <p>Quantitative evidence such as the number of program participants and number of program completers</p>
Sustainability	How long has the program been in place?	Sources and types of funding: one-time grants vs. ongoing professional development funds; public vs. private funds

or by reviewing the program's qualitative or reflective assessments, such as exit interviews or workshop evaluations.

Sustainability

A TMPD program's sustainability hinges on two factors: its type and source of funding and its prospects for future expansion. Like many programs, TMPD programs for teachers and school leaders typically start out on a small scale (i.e., at the school or district level) and are funded through public or private grants.

SUMMARY AND CONCLUSIONS

The advent of technology-mediated professional development has created many additional educational opportunities for teachers and school leaders. While there is some research to support the use of particular varieties of TMPD, additional work is needed to determine how best to design, deliver, and support professional development with technology. This paper represents an initial survey of this emerging and promising field as well as a first step toward describing the criteria for assessing current and future TMPD programs.

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