

Introduction to Professional Development Strategies in Educational Technology

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Purpose, rationale, value

In an effort to assist those who are (or will be) responsible for planning, implementing and/or assessing professional development in educational technology, this text provides an overview of professional development (PD) programs that have demonstrated long-term success through assessment of outcomes to provide recommendations for future effective professional development efforts. In the past, PD programs in educational technology have often focused on developing teacher competency in using specific hardware and software applications. By contrast, the models described in this text focus on approaches that expand teachers' knowledge, skill and confidence in using technology tools in teaching and learning environments, with the focus on improving teaching and learning rather than on the technology use. Some teachers may be hesitant or even resistant to trying new instructional methods, yet the introduction of new technology tools in the classroom, accompanied by the appropriate professional development, may enable these teachers to implement student-centred constructivist approaches (Matzen & Edmunds, 2007). Although there is no one "right" approach to working with teachers, professional developers will increase their chances for success in developing a PD program for their local context when they base their work on a solid theoretical background of adult learning theory and organisation development, along with an understanding of lessons learned from the practice of others through the years. This text aims to assist professional developers in just this way – through the guidance of fellow practising professionals involved in innovative programs being implemented both nationally and internationally.

Content of the book

The book is divided into three sections: (1) a set of introductory chapters that provide a history of professional development in educational technology as well as a grounding in the literature on adult learning and organisational climate for effective professional development; (2) chapters on successful and cutting-edge professional development models that describe program planning, implementation and assessment; and (3) a closing chapter that highlights lessons to be learned by professional developers through reading this book. The professional development models included in the text represent long-term projects from which the authors could discuss observed outcomes (e.g. changes in learning environments) and recommendations for successful future implementation. The models involve a variety of information and communication technologies and the work of colleagues across the United States, Australia and New Zealand.

Diffusion of innovations

From Everett Rogers (2003), professional developers have learned that the adoption of innovations is dependent on several interrelated models of change. Individual teachers themselves, as adopters of new technology innovations, fall into predictable categories that describe their comfort with and level of adventurousness towards the uncertainty of newness. *Innovators* are at the cutting edge, latching onto new instructional technologies first. The majority of teachers will fall into one of three middle categories: *Early Adopters*, *Early Majority* and *Late Majority*. Bringing up the rear are the *Laggards*, who tend to resist new innovations and frequently pose the largest challenge to professional developers. The decision process that an individual teacher goes through to adopt an innovation also follows a developmental pattern through the stages of *Knowledge*, *Persuasion*, *Decision*, *Implementation* and *Confirmation*. And each innovation itself possesses attributes that make it more or less desirable to an adopter: *Relative Advantage*, *Compatibility*, *Complexity*, *Trialability* and *Observability*. Those who are conducting professional development sessions are often placed in the role of “Change Agent,” a role described by Rogers as one that changes or shifts during the diffusion process, a role that eventually leads to working oneself out of a job as others become more proficient.

Four-stage professional renewal cycle

Kansas State University faculty members Gerald Bailey and Dan Lumley (Bailey & Lumley, 1997) revisited this model, initially developed by Joyce and Showers (1988), which is designed to describe how educators interact with new educational materials and strategies. At the beginning of the cycle, participants interact and share ideas about the new material (*Information*). The next stage gives an opportunity for the group to see the new teaching approach in action via an actual lesson or possibly a video recording (*Demonstration*). Time is then devoted to practising this new approach so that each participant gets a chance to experience it firsthand (*Practice*). After the practice, it is important for the participants to come back together to share their experiences. The final stage is to pair each participant with a coach who is well trained in the new teaching approach. It is at this stage that the participant works out specific details that apply to his or her teaching environment (*Feedback*).

Knowledge, attitude, skill, aspiration and behaviour (KASAB)

A common model of planning for professional development is *Knowledge, Attitude, Skill, Aspiration and Behaviour*, or KASAB (Killion & NSDC, 2002). The KASAB model helps professional developers understand how teachers move beyond merely creating a path to achieving a specified goal. In this model, professional developers focus on having teachers learn more about a topic (*Knowledge*). Once the teachers experience the possibilities, they are motivated (*Attitude*) to learn more about the topic. After taking time to build their skills (*Skills*), the teachers are further motivated to develop lessons themselves using their newly acquired skills (*Aspiration*). The resulting behaviour is that teachers will change how they teach (*Behaviour*).

New consensus model: Individual and collaborative inquiry

In 2002, one Minnesota school established a project that required long-term participation from its teachers. Small groups of teachers collaboratively investigated pedagogical and content issues to bring about a change in teaching practice (Hughes, Kerr & Ooms, 2005). This project was based on the new consensus model of Hawley and Valli (1999) in which teachers were asked to choose their own topic of study and collaborate in small groups. Teachers then took part in a careful self-reflection, taking stock of their own beliefs and specific approaches to teaching. Detailed discussions as a group included considering alternatives to current practices and possible effects of each change. Finally, the new practice was integrated into a lesson plan and taught in a classroom. Final discussions with the group about the effect of this new lesson helped to fine-tune the lesson for use in subsequent classes.

Strategies for increasing teacher adoption of technology

On a basic level, the field of education has reached a consensus about what is considered best practice regarding educational technology professional development. In short, professional development will result in the adoption of the desired skill or practice when active participants are the focus of standards-based, integrated content that is continually assessed for effectiveness on many measures.

Focus on participants

Professional developer Angela Peery (2004) compiled a list of the qualities used by teacher-participants to describe an effective professional development experience. The descriptors predominantly focused on treating teachers as professionals who are fully able to make effective decisions about their classroom lessons. Words such as *congenial, no pressure, validation, trust, informative, flexible* and *clear purpose* all describe workshops that respect teachers in their roles of decision-maker and caretaker.

Workshops held by RAND/CTI (Glennon & Melmed, 2000) contributed three additional insights that increased effectiveness of professional development. These include providing: (1) adequate time for teachers to acquire skills and plan the school's programs and activities, (2) assistance that is keyed to the needs of the teachers and administrators at times they need it, and (3) a clear vision concerning the purposes and the educational goals that guide the program of the school and classroom.

As studies have shown, a high level of anxiety about computers detracts from the ability to learn skills, and even creates a resistance to learning. In addition, those who are confident of their own ability with computers have been shown to persist at computer-related tasks longer than those who are not (Sam, Othman & Nordin, 2005). Making participants comfortable – such as by offering food and drink, interacting with the participants, and acknowledging the different needs and skills of each attendee – is an effective initial strategy.

Teachers rarely have the opportunity to come together and converse about their teaching (Vanatta, Banister, Fischer, Messenheimer & Ross, 2005). When teachers are allowed to come together and share ideas, participants often find so much in common with one another that they readily find answers to problems with which they have struggled. Collaboration can happen on a large scale, such as by having an entire group of teachers travel to a conference together (Rhine & Bailey, 2005), which can introduce an immediate level of bonding that strengthens a group's ability to exchange ideas and critique new approaches, as well as serves as the foundation for future change. However, smaller-scale collaborative techniques can be just as powerful. Reading and discussing a common book (Joyce & Showers, 2002), participating in a teacher support network or community of practice (Killion, 2007; Niesz, 2007) or frequenting social networking sites for educators (e.g. eduwikius.wikispaces.com or www.infinitethinking.org) can allow teachers the time for shared experiences and development. The ability of a group to bond and length of the program were also found to be critical to the long-term success of any training program (McPherson, Wizer & Pierrel, 2006). In order to help preserve bonding between participants over time, online discussion boards and email discussion lists can be established.

Broad participation

To be fully effective, the exchange of ideas should take place not only among teachers, but also with administrators and other specialists (Fullan, 1982). Technology coordinators and computer-lab teachers play an important role in sharing ideas with general-education teachers about enhancing the curriculum with technology. When professional development is being planned and carried out, or even when a subject-area curriculum is being mapped out, having a technology specialist on hand to answer questions is invaluable. Without this integration of school personnel, curriculum designers often do not take the crucial step of adding specific technology-enhanced activities. The use of technology may be intended, but there are no specific software or activity needs identified to help achieve the desired learning outcomes.

Administrators can also participate by evaluating teachers specifically on how well they integrate technology into lessons. Too often, when a principal or other teacher evaluator sees a computer on and students busy using it, they assume legitimate curricular goals are being met. Of course this is not always the case. With the proper training and awareness of teacher technology use standards (e.g. NETS•T, International Society for Technology in Education [ISTE], 2008), teacher evaluators can more easily spot appropriate and effective uses of technology. By devoting a section of the evaluation process to technology as a teaching tool, evaluators can motivate teachers to integrate new skills they have learned in workshops. As a follow-up activity with the teacher, the well-trained evaluator can then make suggestions about how to improve the lesson.

Table 2.1 | Contrasting processes and practices

Processes and Practices That Seem to Ignore What We Know About Adult Learning	Emerging Processes and Practices for Reflective Consideration
The adult learner is objectified; planners make assumptions about what learners know and are able to do; planners make assumptions about learners' degree of motivation, level of interest, previous experience, personal and professional goals.	Learning, by all adults and children within and across the school community, is the focus of our collective work.
Knowledge rests with leaders, trainers, those who have status or those who have been "trained" to train others.	Knowledge and expertise rests within each member of the school community and our goal as a learning community is to use this knowledge and expertise as our shared resource. Each adult envisions themselves as a leader for learning in some area.
There is not enough time for learners to prepare for, engage, learn, practise and reflect on new knowledge or skills.	Processes around learning, continuous development and collaboration are honoured and adequate time for this work characterises the school culture.
There is little bridging or continuity between adult learning for individuals and larger organisational learning processes.	Each member of the organisation understands how their own learning is connected to the learning of students, teachers, leaders and others within the school community.
The school is a learning organisation in name only; learning efforts are scattered and unfocused.	The school is future-focused and has established processes that allow for learning to occur across the community; all learners model an enthusiasm for individual and organisational growth.

A different scenario

It is a Friday in late autumn, the third late-start day purposely scheduled for teachers in the Happy Valley School District to support their work towards their professional development goals. Today, the focus is on each teacher's technology goal, linked closely to the school's literacy improvement goal. Activity abounds! As we walk through the primary school, we see small groups of teachers meeting in year-level teams to discuss sample lessons they posted last week to a new school website aimed at sharing best practices. Volunteer teacher leaders and literacy coaches facilitate the groups. In the computer lab, the six members of the intermediate science team meet with Dr Mary Maude, who, at the team's request, has agreed to spend this year facilitating hands-on sessions and making follow-up classroom visits to support the use of new technology tools for assessing learning. At the high school, cross-disciplinary teams consider a draft of new technology standards for high-school graduates. A task force of students, teachers, administrators and community members has responded with enthusiasm to the charge to define technology literacy. By ten o'clock, notes from each of the team meetings and electronic feedback surveys are available electronically to the school's Professional Development Committee. The notes indicate the progress made in today's sessions and identify what is needed to move closer to achieving personal and school goals during the next late-start day.

If this chapter has succeeded in helping the reader understand and reflect on principles of adult development, then it is possible to envision and actualise such a radically different scenario within each school setting. Here, teachers' learning is the essential focus if student learning is to be enhanced. By engaging each adult in his or her own learning and by supporting an every-learner-a-leader culture, meaningful, job-embedded focus becomes the cornerstone of professional development.

LITERATURE ESSENTIALS

Activity theory

Activity theory is a conceptual framework, built on Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD), that is useful in studying how subjects move towards reaching outcomes with the help of certain psychosocial contexts and technologies. The outcome of an activity system is a product of all the interdependent components of the system: the subject, community, division of labour, tools and rules (Table 6.1). These components act together to move the entire system towards an outcome or goal.

A. N. Leont'ev analysed activity at three levels: operations, actions and activities. This hierarchy classified *operations* as the basic level of activity, while *actions* are directed at achieving goals. Systems that function at an action level merely accomplish a set goal (Kuutti & Arvonen, 1992), while an activity system meets the needs of the community with longer-lasting and more meaningful effects. Actions by individuals can be considered more linear and one-way, while activities of groups are iterative and expansive (Engeström, 1999). The table below (Warriner, 2005) outlines some possibilities for different relationships of a teacher as participant – the “subject” in an activity system – from operations to actions to activities.

Table 6.1 | An example of an activity system with a teacher as subject

	Goal of Operation	Goal of Action	Goal of Activity
Teacher as Subject	Teaches same as always	Looks for new ways to teach	Seeks to understand students' learning
Tool	Proven lesson plan materials	Uses technology to teach same lesson	Uses all resources to negotiate with students how and what to teach
Community	Classroom as community	Shares with colleagues to improve	Develops and expands new relationships that influence practice
Rules	Teacher as knowledge dispenser	Includes standards as guidelines for teaching	Collaborates with teachers and students to determine operating and learning principles
Division of Labour	Teacher as worker, student as learner	Team teaching, cooperative learning	Teacher as co-learner with students
Object	Completed lesson	Meet standards	Co-create learning expectations with students