Pioneers Becoming a Community: The Role of Administration in Technology Adoption

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# Abstract

Technology Adoption: Pioneers Becoming a Community

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Technology, an integral part of our students’ lives, is often viewed by many teachers as a foreign intruder into classroom instruction. Implementation of technology to help students engage in higher order, rigorous learning fills many teachers with fear and uncertainty. Those feelings are not eased by top-down approaches that have dominated public school reforms throughout the history. To create lasting change, schools need to abandon top-down, “drive-by” reform models to school reform and take a different approach to creating sustainable classroom changes. The most profound changes in classroom instruction will take place when schools become learning organizations (professional learning communities), involving every stakeholder in student learning, setting in motion “the internal processes by which people progressively learn how to do what they need to do in order to achieve what is worthwhile” (Elmore, 2008, p. 73). Thus, collaboration and personalized professional development can more effectively facilitate sustainable technology adoption processes at schools and become a part of instructional practices in every classroom rather than being concentrated in small pockets of excellence.

**Introduction**

For decades, the American public school system has been subjected to changing societal demands and subsequent reform efforts directed at improving the education of American children. Perceived as not delivering rigorous and robust education, schools are required to engage in wide ranging reform efforts to address broader needs, ranging from supplementing family networks to helping the country remain competitive in an emerging global economy. Additionally, exponential advances in technology are making the world flat while driving schools to change their teaching and learning practices to meet the needs of students who have grown up in a world of simulated virtual experiences and instant communication.

# Problem Statement

As digital immigrants, teachers use technology to make their lives less stressful and more meaningful. For students, the digital natives, technology is much more complex and multifaceted, having become a natural extension of their lives. Students spend substantial portions of their days listening to music on iPods, playing video games, text messaging, tweeting, or watching TV, engaging in a world full of excitement, meaningful learning, social networking, and cooperation. Schools, however, are not living up to the same excitement level in the classrooms. Technology is often limited in its uses to enhancing existing instructional practices rather than facilitating new approaches to teaching and learning that meet the needs of today’s students. This paper explores possible reasons for the lack of teacher technology adoption and provides some recommendations and guidelines for administrators to use in enhancing and sustaining technology integration in the classroom.

# Guiding Questions

Specific questions used to guide this study included:

* What is the current state of teacher use of technology in the classrooms?
* What does the research on change tell us about creating sustainable change in teacher instructional practices?
* What are the implications for building and district administrators in enhancing and sustaining technology implementation in their schools and districts?
* How can accountability practices facilitate or hinder meaningful technology adoption in the classroom?
* How can Professional Learning Communities (PLCs) support meaningful instructional changes in regard to technology implementation in the classroom?
* What professional development practices can help support meaningful technology implementation in the classroom?

# Literature Review

 This paper outlines the current reality of technology adoption, focuses on the overview of technology adoption within the framework of sustainable change, and the role of accountability and educator perceptions in technology implementation. The conclusion concentrates on answers to the guiding questions based on the performed research. Implications for administrative practice conclude the paper.

## Technology Adoption: Current Reality

With the development of technology and the increasing public demands for schools to produce workforce ready citizens, there appears to be relative stagnancy of meaningful technology adoption in classrooms. Millions of dollars have been invested in creating, sustaining, and upgrading the technology infrastructure in the nation’s schools. However, technology use in the classroom has had little or no impact on student learning (Christensen, 2011). Technology is still primarily used for simple tasks such as Word processing leaving instructional practices relatively unchanged. Christensen notes that teachers still resort to such traditional approaches as lecturing, whole group instruction, small group projects with little clarity of expectations, and PowerPoint presentations for lectures to add variety to the lesson pacing. Thus, even though the technology has been physically placed in classrooms, most teachers implement it “to sustain their existing practices and pedagogies rather than to displace them” (Christensen, 2011, p. 84).

## Process of Change and Technology Adoption

Just as with any innovative instructional practices, technology use levels vary across the classrooms. Dede (1998) calls educators who tend to implement alternative types of instructional practices “pioneers.” These teachers embrace change as a part of their professional growth and accept going against the conventional approaches to sustain innovation in their classrooms. Their practices are formidable but usually are limited to their individual classrooms. Mohammad (2009) calls these teachers “believers”. “Believers” feel that all students can learn and that they can directly affect student learning. These teachers are effective in their classrooms but usually do not offer their expertise to others. As long as this group’s belief system is not directly challenged, they are not vocal.

 Dede’s (1998) “settlers”, people who enjoy stability in their professional lives and do not see extraordinary effort as a part of everyday life, must be convinced to take a leap of faith and try new approaches as they believe that they will be able to sustain their daily practices without extraordinary amounts of effort. Muhammad’s (2009) view of this group reflects three factions: “fundamentalists”, “tweeners”, and “survivors”. Each group has to be convinced to try new approaches to using technology by seeing the benefits to their instruction. Changes in instructional practices have to be supported by the use of theory to help teachers understand the reasons for change as well as by opportunities to peer observe and practice the skill of proficiently using technology in the classroom.

Research on the process and sustainability of change emphasizes the need to develop a system of internal support in order to create sustainable change in instructional practices (Fullan, 2005; Elmore, 2008). Professional Learning Communities (PLCs) provide one model through which the internal support system can be developed and sustained. The practices of the PLCs need to be focused on the purposeful implementation of technology to create learning and literacy rich school environments. These internal support structures have the potential to help teachers become knowledgeable of technology uses designed to meet the learning needs of the millenials rather than adhering to teaching methods from decades past (Christensen, 2011).

Bringing about sustainable change in classroom practices demands a collective approach to innovation, support for professional development, and sustainable vision for student and teacher success. In this context, we must rethink the concept of leadership in public schools, as leading these complex organizations requires new knowledge and skills (Elmore, 2008). As official leaders of their schools, principals should possess basic technology skills to be able to support their teachers in implementing new technologies and promote new technological advances (Dede, 1998). Student learning, however, may benefit tremendously through collaborative work with teacher leaders rather than principals embarking on this venture by themselves.

Technology leadership demands that school principals act as facilitators of change, creating an environment of collaboration, collegiality, and continuous learning (Ross and Bailey, 1996). Effective technology leadership embraces team teaching and development of collaborative teams to facilitate the exchange of ideas regarding uses of information technology (Robinson, 1994). To meaningfully implement instructional technology, teachers need to be supported in the job-embedded professional development environment to ease their fears about technology integration and meeting the needs of 21st century learners (Ross and Bailey, 1996).

## Educator Perceptions of Technology

Continuous demand for school reform keeps public schools in a state of constant change. However, as we evaluate the history of reform movements in America, it becomes evident that the resultant changes have never fundamentally affected student and teacher work in the classroom (Elmore, 2008). Fullan (2005) argues that schools have learned to deal with the overwhelming influx of reform movements by engaging in superficial changes to their structures but remaining virtually unchanged in the area of instruction and assessment. Fullan (2005) notes that public schools do not suffer from a low level of innovations and suggests the relatively few changes in the classroom instruction are a result of too many unrelated, superficial innovations. The unconnected, unfocused nature of innovations disenchants educators who have seen too many fads come and go without sustainable changes in their instructional practices and, consequently, student achievement (Fullan, 2005).

 The physical placement of the computers in the classroom has often been regarded as sufficient for technology implementation in schools. Reflecting that attitude, Dede (1998) sarcastically compares classroom technology to fire suggesting that students can consume beneficial knoweldge and skills just by sitting next to the electronic devices. Not feeling adequately prepared to implement instructional technology to enhance student experiences or engage in problem-based learning, teachers choose to engage in superficial applications of technology or promulgate the idea that the strategies used for years are adequate to reach the current generation. The constant state of change and subsequent lack of progress has created a “this, too, shall pass” attitude in many classrooms across the nation (Fullan, 2005).

# Accountability and Its Impact on Technology Implementation

In this era of accountability and laser focus on student achievement, schools and their leadership are expected to produce results quickly. The focus on standardized testing and one-shot assessment practices at the end of the school year exacerbates educator resentment toward the implementation of new instructional practices (Elmore, 2008). Concentration on teaching basic skills facilitates educator use of technology on the same basic level rather than trying new instructional problem based learning approaches to hone student critical thinking skills (Dede, 1998). Demands of standardized testing lead to standardized responses in technology use; a far cry from creative, multifaceted approaches to meeting diverse student needs where technology exhibits such tremendous potential. In this regard, without sustained, systemic change to the instructional core involving collective accountability and continuous learning to meet the needs of the 21st century learners, schools will not be able to significantly affect student achievement (Fullan, 2005).

DuFour and Marzano (2001) point out that improvement in student achievement is a collective act rather than a compilation of isolated, unconnected events. Fullan (2005) also reinforces this notion by saying that only within the context of systemic reform can schools internally contribute to their own continuing transformation. Implementing systemic changes in regard to technology also means simultaneously incorporating innovations in curriculum, assessment, and school processes. Unless a systemic approach is used by school leaders, teachers will retain their cynicism about ad hoc innovations and continue superficial use of technology that has so much more to offer to enhance student learning (Dede, 1998; Fullan, 2005).

## Role of PLCs in Technology Implementation

The research on distributed school leadership validates the importance of shared decision making concerning instruction, assessment, and student learning (Elmore, 2008; Fullan, 2005). The PLC process is attributed to increases in student achievement and highly successful schools (DuFour et al., 2010). Dufour, DuFour, Eaker, and Many (2010) define the PLC as an ongoing process in which educators collaboratively engage in the process of collective inquiry and action research to achieve better student results. If implemented with fidelity, the process is effective in building collective capacity and engaging all stakeholders in achieving shared goals.

The creation of school leadership teams facilitates the implementation of this complex concept. Elmore (2008) supports the leadership team concept by stressing that it is vital to distribute the responsibility for leadership among different roles in a knowledge-driven organization. Elmore believes the complex tasks that contribute to the creation of common culture, a set of values, symbols, and rituals cannot take place without distributed leadership. Dufour and Marzano (2011) echo this statement in saying that effective principals should contribute to the development of shared leadership by identifying and developing educators to lead their collaborative teams. The collaborative process is not likely to be sustained without effective leadership at the team level (Dufour and Marzano, 2011).

Creating collaborative content teams within a PLC and hoping for success is not enough. Principals have to support the work of these teams by working with teacher leaders and leading the school’s quest for improvement through system-wide learning. Principals and teachers must invest in developing institutions that are ’learning systems’, organizations that can internally contribute to their continuing transformation. Without distributed school leadership, continuous transformation is not possible (Fullan, 2005). In creating structures for a successful PLC process, Elmore (2008) suggests, “Organizations that improve do so because they create and nurture agreement on what is worth achieving, and they set in motion the internal processes by which people progressively learn how to do what they need to do in order to achieve what is worthwhile” (Elmore, 2008, p. 73).

## Professional Development within Sustainable Change Reforms

 Teachers will not be able to maximize the technology tools without continuous, high-quality professional development in the innovative models of teaching and learning made affordable and sustainable by instructional technology (Dede, 1998). Professional development as an effective learning vehicle for teachers can be viewed within the context of a differentiated learning model.

Dede (1998) reflects on studies of innovations as three levels of successful change: bottom-up, middle-out, and top-down. Dede suggests this change takes place through professional development that helps educators feel empowered by observing their pioneer colleagues use technology and seeing the impact of use on student achievement. Teachers can then see a clear path to incorporating technology into their daily routines without making continuous personal sacrifices to master technology use in the classroom. Bowgren and Sever (2010) echo this position by asking districts to systematically move from the one-shot, externally developed training, to job-embedded, teacher-led collaboration differentiated to meet everyone’s learning style. Professional development used to ensure sustainable change must provide meaningful, just-in-time learning opportunities for teachers (Bowgren and Sever, 2010).

The model of professional development outlined by Joyce and Showers (2002) includes four professional development components that will ensure the transfer of teacher learning into classroom practices. In their model, teachers must first be familiarized with the theory supporting the change. Teachers also need to be provided with opportunities to observe strategies being modeled and the time to practice the strategy with peer support. Another vital part of effective professional development is teacher engagement in follow-up opportunities focused on sharing their practices with the support of peer coaches (Joyce and Showers, 2002). Providing this critical peer coaching support is often neglected by school systems as they rush to implement new initiatives without creating the support systems for meaningful implementation of the new practices. The PLC model of coaching and peer support creates a system of support for personalized professional development (Joyce and Showers, 2002).

# Conclusions

 The literature reviewed in this paper was sufficient to support the following conclusions for each of the guiding questions:

What is the current state of teacher use of technology in the classrooms?

As the world continues to evolve and experience exponential industrial and social connectedness growth due to technology, schools face mounting pressure to meet the needs of evolving society. Throughout the years, however, relatively little has changed in regards to the instructional practices in schools. Superficial changes took effect in scheduling, graduation requirements, and coursework descriptions but these changes rarely affected the heart of teaching and learning: the classroom environment. Teachers face a multitude of initiatives on a yearly basis, with little follow-up and support from the administrative and professional development staff. The ad-hoc innovations and lack of coherent support result in teacher reluctance to embrace change and insecurity in adopting innovative approaches due to the perceived weakness or lack of knowledge.

Technology adoption in the classroom is riddled with complexity and teacher concerns. Teachers claim that they use technology tools, but the implementation of technology in the classroom serves the same purpose as the use of chalkboards or worksheets. Many teachers do not feel comfortable using new technology tools for interactive, independent activities that help students research, investigate, or present their learning using the mediums that are a part of their lives outside the classroom. However, there are always “pioneer” teachers who are not afraid to explore the new approaches to teaching and learning and change the learning environments into problem-based, collaborative spaces where technology is seamlessly integrated into instruction. These teachers can become the leaders in sustained, job-embedded professional development acting as resources for both their peers and administrators. The use of these internal resources is more likely to result in the sustainable changes at the classroom level than the use of external professional development with a lack of follow-up for a deeper, more meaningful technology adoption.

What does the research tell us about creating sustainable change in teacher instructional practices?

Schools continue to engage in superficial structural changes, such as the changes in schedule, graduation requirements, or tracking systems while classroom instruction and student learning remain relatievly untouched. Michael Fullan (2005) notes that public schools do not suffer from too few innovations. Rather, too many unconnected, shallow innovations serve as obstacles for successful school reform. Schools have learned to deal with the overwhelming influx of reform movements by engaging in superficial changes to their structures but virtually remaining unchanged in the area of instruction and assessment (Fullan, 2005). Sustainable change requires a “reorientation of priorities and values so that the comfort and convenience of the individual is no longer the measure by which the legitimacy of change is considered” (Reeves, 2009, p. 5). Lasting change is not a function of a lone authority figure but a depiction of a valued “value system”(Reeves, 2009, p. 52). Schools need to reevaluate their value systems in regard to collaboration and instructional practices to have sustainable change.

How can accountability practices facilitate or hinder meaningful technology adoption in the classroom?

 In the current era of accountability, top-down approaches result in superficial changes in schedules, graduation requirements, or attendance mandates. Meaningful, sustainable changes, originating in changes at the classroom level, stem from the creation of a shared value system where all stakeholders are engaged in a meaningful change process. PLCs create learning communities that hold teachers accountable to each other for student success, maximize the potential of all stakeholders, and provide meaningful support for those who struggle.

How can Professional Learning Communities (PLCs) support meaningful instructional changes in regard to technology implementation?

Dufour and Marzano (2011) state that effective principals should foster shared leadership by identifying and developing educators to lead their collaborative teams. This team level model of shared leadership ensures educator adherence to the collaborative process with a focus on the issues most vital to student learning. The authors suggest factors for the principals to consider when selecting members for their leadership team. These factors include influence with their colleagues (“opinion leaders”), willingness to lead the PLC process, the ability to think systematically, and a sense of efficacy and willingness to persist (Dufour and Marzano, 2011, p. 57). Team leaders are critical to the improvement processes in schools and must be committed to engage in continuous learning. The deepest learning occurs when they learn by doing- by engaging “in real work in the context of their schools” (Dufour & Marzano, 2011, p. 58).

Principals must support the work of these teams by working with teacher leaders and leading the quest for improvement through system-wide learning. Principals must invest in the development of institutions as learning systems, capable of guiding their own transformation (Fullan, 2005). Without distributed leadership in schools, continuous transformation is not possible. The PLC model creates structures that promote learning from within, ensuring that the implementation of new instructional approaches takes place in a collaborative and safe environment, and is differentiated to fit the needs of the teachers and students. The use of teachers as experts initiates changes at the instructional level, the level where meaningful, authentic change occurs.

What professional development practices can help support meaningful technology implementation in the classroom?

Organizations do not change without changing individual behavior. However, individual behaviors cannot be changed without affirming the people behind the behavior (Reeves, 2009, p. 10). Teachers need to be provided with time for collaboration and professional learning to truly effect student achievement. Job-embedded professional opportunities provide for differentiated approaches to learning, maximizing the potential of both groups: teacher experts and the professionals needing support with the instructional implementation of technology. Teacher collaboration during the team meetings and peer observation practices contribute to the differentiated professional development and the subsequent meaningful technology implementation.

# Discussion and Practical Implications

Dede (1998) notes that effective implementation of instructional technology cannot happen unless the concept of distributed learning is incorporated into the learning systems. This concept involves skillful incorporation of educational activities across variety of environments, such as classrooms, workplaces, homes, and community settings. The schools, charged with such tremendous responsibilities, cannot effectively educate today’s youth by themselves. School systems must reach out to the community and extend learning opportunities to homes and community centers.

Engaging teachers as active participants in leading schools to success is a key in promoting collaboration, data-driven decision-making, and focus. Different states use various frameworks to facilitate collaborative practices. The West Virginia State Department of Education uses six continuous improvement process levers to build a culture of high expectations, increase student engagement, and establish collaborative leadership as the cornerstones for working with school leadership teams and their impact on technology adoption in schools (WVDE, n.d). These levers, described below, contribute to the development of continuous school improvement processes while building structures for successful PLCs.

## Creating Community

Teaching is still viewed as independent contractor work, with many teachers continuing to operate on the assumption that asking for help is a sign of weakness. Even though building a collegial community is challenging and requires visionary leadership, team leadership is instrumental in creating a community of learning. Building a culture where every teacher believes that every child can learn and the teacher is responsible for each student’s learning is a tremendous task that cannot be done by a lone hero, a principal who is usually charged by the public to lead the change. Involving teacher leaders and distributing leadership among the “pioneers” who implement exemplary practices leads to a comprehensive system of support in building a school learning community.

## Establishing Focus and Coherence

As a part of creating collaborative school culture, teachers must be involved in decisions concerning the school’s mission, vision, and goals. Teachers need to operate in their content area teams and meet regularly to discuss student achievement and effective instructional strategies. This practice helps turn some “settlers” into “pioneers” and alleviates the daily struggles of teachers who have become disillusioned with the constant onslaught of reforms and new applications of technology. Forming teacher teams and inviting teachers to participate in the school decision-making process helps teachers feel in charge of their own learning and empowered to guide student learning based on data-informed decisions for student success. Involving teachers facilitates teacher efforts to try new strategies and collaborate with their colleagues in using new technology applications with students. This approach allows educators to create learning environments within the classroom walls that video games, social networking, or collaboration with peers provide outside the school environment.

## Supporting Change

In order to welcome change and engage in targeted instructional decision-making, all stakeholders have to engage in professional development that explains the theory behind the new initiatives and provides teachers with opportunities to practice new approaches within a peer-support and peer-modeling environment. The goal for every professional development is to influence student learning. Professional development focused on technology implementation needs to follow the same framework and concentrate on instructional practices that enhance student learning rather than go through a kaleidoscope of technology applications that are considered without deep, meaningful exploration of their impact.

## Building a Collaborative Culture

Building familial relationships helps all stakeholders feel connected. However, schools are dynamic agents of change, and being part of a community is not enough to ensure student success in the 21st century world. Teachers and administrators have to value and model collaboration to create a culture of high expectations and continuous learning. Leadership team meetings should become models for collaborative structures, and the teacher leaders should be able to emulate these models within their departmental team meetings. Appropriate professional development practices need to be embedded to provide for improving teaching practices.

## Maximizing Capacity

The goal of establishing a school culture of learning contributes to sustainable capacity for teacher instructional practices. Differentiated, job-embedded professional development builds teacher collegiality and helps school administrators develop experts within the school. These experts can share their practices and support their peers without resorting to drive-by sessions conducted by outside sources.

## Growing Professionally

 We continue to learn through models of practice. Teachers have opportunities to discuss various school improvement initiatives with leadership team members in other schools and tailor the initiatives to fit the needs of their school. Teacher leaders collaborate informally and during meetings. Professional development is tailored to the needs of students, and, in this case, adapted to challenge the technology infrastructure to support teacher professional development. Teachers model research-based instructional practices during instructional support days and create opportunities for all staff members to share best practices. Thus, teachers grow not only as individual professionals but also as members of a system.

# Recommended Administrative Actions

 System-wide change needs to be implemented systematically, with a targeted administrative focus encompassing all the levers of school improvement described above. Effective technology integration needs to be comprehensively supported by addressing the learning needs and establishing opportunities for ongoing, job-embedded professional development for all stakeholders. Exhibit 1 represents an overview of the proposed model for technology integration where all the pieces of administrative support for collaboration, establishment of sustained focus, and differentiated professional development equally contribute to the heart of sustained technology integration: the change in instructional practices. No piece is more important than the others. However, all the components of this comprehensive system require administrative vision of the school as a learning community where collaboration, peer support, and mutual transparency in high expectations for all stakeholders are visible in everyday functioning of the school. Exhibit 2 provides concrete suggestions for policy and administrative actions in regard to each lever of school improvement, thus providing public school administrators with tangible action steps for meaningful technology integration within the framework of sustained change.

# Summary

Creating collaborative content teams within a PLC and hope for success is not sufficient. Principals must support the work of leadership teams by working with teacher leaders and leading the school’s quest for improvement through system-wide learning. We must invest in developing institutions that are ’learning systems’, organizations that can internally contribute to their own continuing transformation (Fullan, 2005). Without distributed leadership at school, continuous transformation is not possible. In creating structures for a successful PLC process, it is vital to remember Elmore’s (2008) words, “Organizations that improve do so because they create and nurture agreement on what is worth achieving, and they set in motion the internal processes by which people progressively learn how to do what they need to do in order to achieve what is worthwhile” (Fullan, 2008, p. 73).

The process of technology implementation has been slow and superficial at many of the nation’s schools. Even though many teachers embrace meaningful technology use in the classroom with the goal of fostering higher order student thinking, many still use technology tools as glorified presentation tools. Facing budget cuts, school districts struggle to promote a more skillful use of technology and provide meaningful professional development for the faculty.

Thus, other approaches need to be considered in order to build sustainable practices for adopting technology in the classrooms. One of the models discussed in this paper emphasizes the need to develop professional learning communities of sustained instructional practices and draw from the “pioneer” expertise to become a community-wide, sustained practice. Using a differentiated professional development model to deliver just in time sessions geared toward meeting the needs of students should lead to an increased intrinsic motivation to use new practices, as the increased teacher comfort levels and positive perception of innovation drive continuous changes in the classroom. The end result will be increased student achievement.

# Exhibit 1

**Proposed Model for Technology Integration**

# Exhibit 2

**Recommended Policy and Administrative Actions**

|  |  |
| --- | --- |
| Focus Area | Strategies/Guidelines |
| Creating Community | * Encourage teamwork, sharing, and collaboration through scheduling process;
* Involve teacher leaders in providing systems of support via peer observations and collaborative team meetings;
* Distribute leadership among the “pioneers” who implement exemplary practices;
 |
| Establishing Focus and Coherence | * Involve teachers in school decision-making process;
* Ensure that teacher meetings follow the school’s mission and vision;
* Facilitate regular meetings for discussions about student achievement and instructional strategies that work;
* Facilitate teacher learning and discussions based on data-informed decisions for student success;
 |
| Supporting Change | * Engage teachers in theory-based professional development;
* Make teaming time sacred;
* Model technology integration and collaborative strategies continuously;
* Provide teachers with multiple opportunities to practice new strategies and technology-supported practices with peer support;
 |
| Building a Collaborative Culture | * Value and model collaboration;
* Sustain culture of high expectations in teacher leadership meetings;
* Follow protocols for collaborative meetings with a focus on peer support in technology integration;
* Embed professional development practices school wide;
 |
| Maximizing Capacity | * Provide differentiated, job-embedded professional development to build teacher collegiality;
* Provide support for experts in the field to share their practices with peers within the job-embedded environment.
 |
| Professional Development | * Provide job-embedded professional development through the use of collaborative team practices;
* Allow teachers to model research-based practices during instructional support days;
* Create opportunities for all teachers to share their best practices.
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# References

Bowgren, L., & Sever, K. (2010). *Differentiated professional development in a professional learning community.* Bloomington, IN: Solution Tree Press.

Christensen, C. (2011). *Disrupting class: How disruptive innovation will change the way the world learns.* New York, NY: McGraw Hill.

Dede, C., Ed. (1998). *Learning with technology* (1998 ASCD Yearbook). Alexandria, VA: Association for Supervision and Curriculum Development.

DuFour, R., Dufour, R., Eaker, R., & Many, T. (2010). *Learning by doing: A handbook for professional learning communities at work.* Bloomington: Solution Tree Press.

Dufour, R., & Marzano, R. J. (2011). *Leaders of learning: How district, school, and classroom leaders improve student achievement.* Bloomington: Solution Tree Press.

Elmore, R. F. (2008). *School reform from the inside out: Policy, practice, and performance.* Cambridge: Harvard Education Press.

Fullan, M. (2005). *Leadership and sustainability: System thinkers in action.* Thousand Oaks: Corwin Press.

Fullan, M., & Hargreaves, A. (1996). *What's worth fighting for in our school?* New York: Teachers College Press.

Joyce, B., & Showers, B. (2002). *Student achievement through staff development.* Alexandria, VA: Association for Supervision and Curriculum Development.

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results.* Alexandria: ASCD.

Mohammad, A. (2009). *Tranforming School Culture.* Bloomington: Solution Tree Press.

Reeves, D. B. (2006). *The learning leader: How to focus school improvement for better results.* Alexandria: Association for Supervision and Curriculum Development.

Reeves, D. B. (2009). *Leading change in your school: How to conquer myths, build commitment, and get results.* Alexandria: ASCD.

Robinson, B. (1994). Technology leadership in the English educational system: From computer systems to systematic management of computers. In Kearsley, G. & Lynch, W. (Eds.), *Educational technology: Leadership perspectives,* New Jersey: Educational Technology.

WVDE. (n.d.). *Coaching for Learning: The Six Levers for Continuous School Improvement*. Retrieved, from West Virginia Department of Education: <http://wvde.state.wv.us/coachingforlearning/six-levers.html>