

Literature Review

As I review the literature focused on high-quality instructional technology professional development (ITPD), I will begin by first identifying the importance and benefits of using technology in the classroom. Then I will explore the goals of high-quality technology integration and the obstacles that stand in the way of high-level technology use. Next, I will discuss what the research has to say about current professional development practices and their ineffectiveness in changing teacher practice. Finally, I will synthesize the top ten characteristics of effective ITPD and explain how instructional technology coaches are best situated to provide these components to teachers in such a way that classroom technology use is positively affected and impacted.

To begin any investigation into effective professional development practices for instructional technology use, we have to first acknowledge the importance of technology in the classroom. Classroom technology allows students to actively research, collaborate, innovate and share; as well as enabling them to find original solutions to problems (Holland & Holland, 2014). Technology also creates an environment for creative thinking, promotes an increase in engagement, and is believed by teachers to produce academic gains in traditional, at-risk, and high-achieving student experiences (Holland & Holland, 2014; Keengwe, Schnellert, & Mills, 2012). When looked at through the lens of teaching writing, there are gains in motivation, writing ability and critical thinking in laptop pilot programs, and student data can be gathered quickly for teachers to make instructional adjustments (Holland & Holland, 2014; Keengwe et al., 2012).

However, studies repeatedly show that classroom technology is currently contributing to education in a marginal, not central, way (Brown, 2006). Additionally, the benefits listed above

are typically found only in classrooms where technology teacher training programs are implemented and completed with high fidelity (Sabzian, Gilakjani, & Sodouri, 2013). Simply inserting technology into a classroom setting will not achieve the desired results: technology in the classroom will only be as effective as its users allow it to be (Pascal, Sass, & Gregory, 2015).

So the goals of technology integration need to be more than simply using technology for the sake of using technology: teachers should be integrating for the educational benefits that can come from technology use (Matherson, Wilson, & Wright, 2014). The technology should be blended to enhance the learning experience and develop thinking skills, and technology should be integrated to advance learning goals so students focus on the subject, not the tool (Wachira, Keengwe, & Onchwari, 2008). According to Mitchem, Wells, & Wells (2003), teachers should be trying to move students from the passive reception of knowledge to active engagement. Teaching styles must change as teachers work to engage learners in authentic, project-based learning environments (Palak, Walls, & Wells, 2006). Professional development must focus on developing teacher capacity with technology tools so they can transfer this knowledge to their students (Keengwe & Onchwari, 2009). This kind of change does not come quickly. In studies of teacher technology training programs, it took the first year for teachers to start become comfortable with technology, and it was three full years before they used technology naturally, with it becoming an integral part of developing their learning environment (Fisher, Dwyer, & Yocam, 1996).

Developing teacher capacity can be an uphill battle. Teachers are being asked to integrate what used to be reserved only for technology teachers. As Plair (2008) points out, this is as foreign to some teachers as asking that “pliers, hammers, and screwdrivers from woodshop be

included in the English Classroom” (p. 71). In studies where teachers were asked to picture a perfect learning environment, no participants included technology without prompting (Shiue, 2007). Teacher technology self-efficacy hinders effective integration, as increased levels of technological anxiety make teachers reluctant to integrate tech if they don’t, in the words of Shiue (2007), feel “artful in its use” (Sang, Valcke, van Braak, & Tondeur, 2010; p. 446).

Teachers need to be taught how and why to use technology meaningfully for learning, and since 14% of teachers have advanced technology skills and less than 20% of teachers consider themselves well prepared to integrate technology, quality professional development has to be taking place on a regular basis (Gorder, 2008; Brown, 2006; Martin et al., 2010; Shiue, 2007). Those of us who train teachers have to effectively increase their knowledge and skills and help them develop positive attitudes about technology use if technology is going to be integrated in a meaningful way (Acikalin, 2014).

It seems obvious that professional development is an important factor in the academic success of our teachers, but schools struggle to establish high-quality plans for instructional technology integration (Gaytan & McEwen, 2010; Mitchem et al., 2003). Many school districts look at what students need, but overlook what teachers need, even though they are expecting them to use technology for instruction (Alexander & Henderson-Rosser, 2010). School districts often get preoccupied when adding technology and do not set aside funds for professional development, such as was the case in the Newton-Conover City School (NCCS) system (Mouza, 2002). When the NCCS district focused on only purchasing new technology, there was no position in the district to assist with integrating technology into planning and instruction. As a result, the technology was underused or avoided (Linton & Geddes, 2013). Adding technology in

this way can backfire and widen the digital divide between students with teachers who effectively integrate technology and those who do not (Ketterer, 2008).

Even when professional development is planned for, it is often in the model of traditional workshop training, which does not help teachers integrate technology or adopt new knowledge and skills (Wells, 2007). Too often, technology trainings tend to be “just in case” instead of “just in time,” with programs that are too broad and that try to include too much information into short trainings (An & Reigeluth, 2012). As listed by Wells (2007), traditional professional development faces multiple design errors: the learners are viewed as homogeneous, instructional objectives are loosely defined, there is insufficient time for application after the event, there is no continued support, and the evaluation plan is not tied to instructional objectives or used as feedback. This is why to effect a change in instruction, we have to change our model of professional development (Matherson, Wilson, & Wright, 2014).

There is a movement in instructional technology professional development (ITPD) away from in-and-out workshops, which indicates that the best professional development is spread out and has opportunities for follow-up and feedback (Lawless & Pellegrino, 2007). ITPD needs a new phase after the workshops have ended (Plair, 2008). In the words of Matherson et al. (2014), professional development needs to become “a process and not microcosm events presented in the ‘sit and get’ format and irrelevant to the realities of the classroom” (p. 49). If the central goal of ITPD is to “persuade the learner to learn about, try, then *continue* [emphasis mine] to use an innovation,” we must take a much closer look at how we go about doing that (Harris, 2008, p. 24). We know that it takes anywhere from fourteen to thirty hours of professional development for a new skill to be integrated into classroom instruction (Martin et al., 2010; Schrum, 1999).

With this in mind, we should work towards creating training and support that possesses the characteristics of high-quality ITPD as found in the literature.

The top ten research-based characteristics of effective ITPD are as follows, moving from the least-cited characteristics to those that are the most frequently referenced in the literature. It is vital to know these high-quality characteristics, because if teachers are appropriately trained before they enter the real situation, their effectiveness rises and they are more likely to use technology in the classroom (Sabzian et al., 2013). Starting with number ten, teachers have to feel that the benefits of ITPD outweigh the time they are investing (Kanaya, Light, & Culp, 2005; Sabzian et al., 2013; Shelly, 2000). This is followed by having procedures in place for evaluation of the teachers' learning in the ITPD session (Gaytan & McEwen, 2010; Martin et al., 2010; Rodriguez & Knuth, 2000; Wells, 2007). Institutional support is necessary for teachers to implement the knowledge they gain in their professional development. This is essential at both the campus and the district level (Gaytan & McEwen, 2010; Harris, 2008; Rodriguez & Knuth, 2000; Sabzian et al., 2013; Shelly, 2000). Modeling by colleagues during professional development is another key component to teachers acquiring and implementing new knowledge and skills (An & Reigeluth, 2012; Cannistraci, 2011; Martin et al., 2010; Mouza, 2002; Sabzian et al., 2013). When being trained to use technology, teachers need to use that same technology while they are being trained (Lawless & Pellegrino, 2007; Martin et al., 2010; Mitchem et al., 2003; National Foundation for the Improvement of Education, 1996; Rodriguez & Knuth, 2000; Scott & Mouza, 2007). Professional development must also be both engaging and active (An & Reigeluth, 2012; Kanaya et al., 2005; Klein & Riordan, 2011; Martin et al., 2010; National Foundation for the Improvement of Education, 1996; Rodriguez & Knuth, 2000; Wells, 2007).

For teachers to use what they learn in the classroom and grow in their understanding, there must be non-threatening support and follow up (Matherson et al., 2014; Martin et al., 2010; Mouza, 2002; National Foundation for the Improvement of Education, 1996; Rodriguez & Knuth, 2000; Sang, Valcke, van Braak, & Tondeur, 2010; Schrum, 1999; Shiue, 2007; Wells, 2007). High-quality and effective ITPD has extended duration, comprised of both an extended span of time to implement along with a high number of contact hours outside of the initial session (Gaytan & McEwen, 2010; Kanaya et al., 2005; Keengwe et al., 2012; Lawless & Pellegrino, 2007; Martin et al., 2010; Matherson et al., 2014; Mitchem et al., 2003; National Foundation for the Improvement of Education, 1996; Rodriguez & Knuth, 2000; Wells, 2007). The professional development must provide time for collaboration and reflection (Gaytan & McEwen, 2010; Gorder, 2008; Kanaya et al., 2005; Lawless & Pellegrino, 2007; Martin et al., 2010; Matherson et al., 2014; Mouza, 2002; National Foundation for the Improvement of Education, 1996; Rodriguez & Knuth, 2000; Scott & Mouza, 2007; Shelly, 2000; Wells, 2007). As Klein and Riordan (2011) point out, without reflection, there is a danger that the experience could be misunderstood and not applied accurately to classroom practice. Finally and most importantly, effective ITPD has to be learner-centered. In other words, it must be content-specific and have a clear connection to classroom practice (An & Reigeluth, 2012; Cannistraci, 2011; Harris, 2008; Hora & Holden, 2013; Kanaya et al., 2005; Klein & Riordan, 2011; Lawless & Pellegrino, 2007; Martin et al., 2010; Mitchem et al., 2003; Mouza, 2002; Rodriguez & Knuth, 2000; Scott & Mouza, 2007; Shelly, 2000; Wells, 2007). With these ten components in mind, all ITPD must allow teachers to begin from their own base of knowledge, and needs to be

descriptive rather than prescriptive of a specific and inflexible classroom approach (Kanaya et al., 2005).

Since high-quality professional development requires such an obvious commitment of time and planning, what individual is best situated to make sure that teachers have access to all the characteristics listed above? The growing answer in many districts is the instructional technology coach. Having access to a coach positively impacts teachers' use of new resources, and teachers need time with a coach to embrace instructional technology (Cannistraci, 2011). Since it is clear from the research that traditional workshops are ineffective and that high-quality professional development requires extended duration, non-threatening support and follow up, as well as several other one-on-one characteristics, only a coach can provide these components which are tailored to the needs of individual teachers (Lawless & Pellegrino, 2007).

An instructional technology coach has to have a broad skill set, ranging from technical skills to a broad resource base to the ability to develop curricular materials for and with teachers (Sugra, 2005). Coaches facilitate high-quality, extended-duration professional development by observing lessons, providing feedback, guiding participants through reflective practice, modeling instruction, providing technical support, assisting with lesson planning, tailoring visits to classroom needs, and blending their skills dependent on teacher choice (Sugra, 2005; Martin et al., 2010). Instructional technology coaches work to turn technology tools into “curriculum-based learning technologies,” helping teachers to harness the educational benefits of technology in the classroom (Palak et al., 2006, p. 356). Additionally, in the words of Plair (2008), dedicated coaches function as “knowledge brokers” (p. 72), sorting through a wealth of

information, acting as a catalyst for innovation, demonstrating strategies and techniques, working as a teaching artist, and providing on the spot professional development.

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