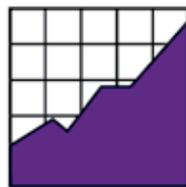


**Professional Development to Improve  
Accommodations Decisions—A Review of  
the Literature**



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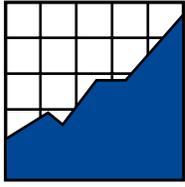
# **Professional Development to Improve Accommodations Decisions—A Review of the Literature**

Jennifer R. Hodgson • Sheryl S. Lazarus • Martha L. Thurlow

**August 2011**

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## **Executive Summary**

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Teachers play an important role in making decisions about students' accommodations for instruction and assessment. Although teachers are a significant part of the decision-making process, 'gaps' in teachers' accommodations knowledge are well documented. Some of these gaps may be due to challenges in providing teacher professional development, including teachers' limited time.

A possible solution is to provide online professional development for teachers. Online training has the potential to avoid some of the pitfalls of traditional professional development, which require participants to meet at the same place and time. Because teachers are likely to have Internet access at work and at home, there is greater flexibility in how the training is provided when it is online.

The National Center on Educational Outcomes (NCEO) is developing online training for the state of Alabama. In preparation for this development, we conducted a review of the literature to learn more about the characteristics of high-quality online accommodations training. This report summarizes the research literature for both professional development on accommodations decision making, and traditional and high-quality online teacher professional development.



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## Overview

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Many teachers have gaps in their knowledge about how to appropriately make decisions about the use of accommodations for instruction and assessment. The quality of professional development on the use of accommodations varies widely from school to school and from district to district. Also, a gap often exists between state accommodations policies and local implementation (Ketterlin-Geller, Alonzo, Braun-Monegan, & Tindal, 2007; Lazarus, Thompson, & Thurlow, 2006).

Currently both general and special education teachers often receive a hodgepodge of information about the use of accommodations from a variety of sources—and it often is “hit or miss” whether any given teacher knows how to use accommodations to improve instructional and assessment practices at his or her school (Altman et al., 2008; Langley & Olsen, 2003). Teachers face many competing demands upon their time and there is limited time available for professional development (Dede, Ketelhut, Whitehouse, Breit, & McClosey, 2009).

For teachers with limited time, online professional development is a potential solution. More teachers than ever before are connected to the Internet at home, work, and everywhere in between. In a recent survey by the National Center for Education Statistics (NCES), approximately 84 percent of school districts nationwide are connected to a network, of which 100 percent have Internet connectivity (Gray, Lewis, & Tice, 2009). At home, teachers may be part of an online social network, including some popular self-selected teacher communities (Hur & Brush, 2009). Often teachers may prefer online professional development because it offers convenience and flexibility not available in service training (Clary & Wandersee, 2009).

The question, then, becomes: How can the enormous reach and power of the Internet contribute to teachers’ professional development, including some of their knowledge gaps on accommodations for instruction and assessment? While this question remains unanswered, researchers have cautioned that we must not “place the cart before the horse” in developing online training for teachers (Schlager & Fusco, 2003). Consideration should be given to teachers’ needs, competencies, and expectations, as well as the characteristics of teachers’ work settings. In other words, online training should be rooted in teachers’ local contexts and address skills or practices appropriate for teachers’ varied stages of professional development (Schlager & Fusco, 2003).

The National Center on Educational Outcomes (NCEO) is developing online training for the state of Alabama. In preparation for this development, we conducted a review of the literature to learn more about the characteristics of high-quality online accommodations training. This report summarizes the research literature on traditional and high-quality online teacher professional development. The purpose of this report is to review the relevant literature on both the characteristics of high quality accommodations training and of high quality online professional

development for special and general education teachers. We acknowledge that other IEP team members, including principals and other school administrators, also need training on accommodations decision making, but that is beyond the scope of this review.

In this report we identify some considerations for developing online training on accommodations selection, implementation, and evaluation. The report contains five sections. The first explores why teachers need training on accommodations for students with disabilities. The second identifies the training teachers may need to improve accommodations decision-making. In the third and fourth sections, research-based models of traditional and online teacher professional development are presented. Finally, we briefly discuss the implications, based on the literature presented, for developing online training for teachers to improve accommodations decision making.

## **Need for Teacher Training**

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Both the Individuals with Disabilities Education Act (IDEA) of 2004 and Title I of the Elementary and Secondary Education Act (ESEA) of 2001 require the participation of students with disabilities in statewide assessments used for accountability purposes. Some students need accommodations to participate in the assessment. Most students with disabilities participate in the regular assessment or, in states that offer it, the alternate assessment based on grade-level achievement standards (AA-GLAS) with or without accommodations. A few students with the most significant disabilities participate in the alternate assessment based on alternate achievement standards. Some states also offer an alternate assessment based on modified achievement standards (AA-MAS) for students with disabilities who are unlikely to achieve proficiency in the time period covered by their individualized education plan (IEP).

According to Thurlow, Lazarus, and Christensen (2008), accommodations are “changes in the testing environment or procedures that are designed to remove irrelevant variance, thereby producing a more valid measure of students’ knowledge and skills” (p. 18). In other words, accommodations “level the playing field” by measuring the student’s ability rather than his or her disability (Fuchs, Fuchs, Eaton, & Karns, 2000) and can eliminate barriers that are immaterial to the construct being measured.

Teachers and other IEP team members are responsible for selecting and documenting students’ accommodations. However, teachers may not have the knowledge and skills needed to make good decisions about selecting and implementing accommodations. For example, teachers may make inaccurate recommendations (Fuchs & Fuchs, 2001; Helwig & Tindal, 2003; Ketterlin-Geller et al., 2007), and they frequently recommend accommodations that the student does not

need (DeStefano, Shriner, & Lloyd, 2001; Helwig & Tindal, 2003). Teachers' recommendations may also lack consistency over time (Tindal et al., 2008).

There are several factors that explain teachers' difficulty in making appropriate accommodations decisions. First, teachers may use either too few or inappropriate sources of information for accommodations decision making (Fuchs & Fuchs, 2001; Ketterlin-Geller et al., 2007). Some teachers use informal observation of the student, to the exclusion of other sources of information, for making recommendations (Ketterlin-Geller et al., 2007). Other teachers may consider the feasibility of providing the accommodation, rather than individual student needs (DeStefano et al., 2001; Lazarus et al., 2006). Some teachers may be inclined to select accommodations that can be administered to a group of students in a resource or special education classroom setting. And, some teachers may also use student placement (e.g., reading instructional level) or demographic characteristics (e.g., ethnicity, socioeconomic status) to make accommodations decisions (Fuchs & Fuchs, 2001).

Another explanation for teacher's difficulty may be their limited knowledge of the legal basis for accommodations decision making (Crawford, Almond, Almond, & Hollenbeck, 2002; Lazarus et al., 2006). Some teachers, for example, may be unaware that accommodations decisions must be made by the IEP team, rather than by individual teachers (Ketterlin-Geller et al., 2007). It has also been found that often teachers are unable to identify the difference between accommodations and modifications (i.e., changes in materials or procedures that interfere with the construct being measured), as well as the consequences of using modifications on large-scale tests (Lazarus et al., 2006).

## **II. Professional Development for Accommodations Decision Making**

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Given that some teachers make inappropriate recommendations, and many receive little support from school or district administrators (Crawford et al., 2002), professional development should be directed at improving teachers' ability to select and implement accommodations. This section outlines knowledge and skills that, according to the literature, should be addressed in teacher professional development on accommodations. Students with disabilities are taught by special and general education teachers, and both groups of teachers need to be knowledgeable about accommodations—though there may be some differences in what each group needs to know. Moreover, according to DeStefano et al. (2001) it is important that training emphasize collaborative decision making. Interactive and collaborative approaches can facilitate sharing of expertise and information—and lead to improved outcomes as well as sustained change.

To make appropriate decisions, teachers must possess a set of knowledge and skills related to inclusion and large-scale assessment. It is important that teachers have a basic understanding of state and federal laws, including the IDEA and ESEA, which provide legal guidelines for how students with disabilities should be included in state accountability systems (Crawford et al., 2002). Both ESEA and IDEA promote high expectations for students with disabilities. Likewise, teachers should expect all students to achieve grade-level academic content standards (Thompson, Morse, Sharpe, & Hall, 2005).

Teachers should also understand the relationship between accommodations for instruction and assessment. Accommodations for instruction are changes in materials or procedures that provide students access to the grade-level content (Ysseldyke et al., 2001), and should be the starting point in making accommodations decisions. Instructional accommodations may be administered or monitored by the teacher in the regular education classroom. A student's IEP should guide the selection of accommodation for instruction as well as assessment (Ketterlin-Geller et al., 2007).

It is important to consider whether specific instructional assessments are also appropriate to use during an assessment. Depending on the purpose of the assessment and the constructs of interest, assessment accommodations may differ from instructional accommodations. Invalid measurement may result from either introducing an accommodation, or in appropriately denying use of an instructional accommodation, on test day (Ysseldyke et al., 2001). Although there should be consistency among accommodations use for instruction and assessment, they each have a different purpose. Accommodations for assessment prevent test characteristics from interfering with the student's ability to demonstrate what he or she knows (Bolt & Thurlow, 2004). In contrast, accommodations for instruction help provide access to the grade-level curriculum (Thurlow et al., 2008).

Assessment accommodations are changes in test procedures that reduce the effect of a student's disability on his or her test score (Elliott, Braden, & White, 2001). In selecting accommodations for assessment, teachers must consider whether the student has used the accommodation during instruction. If the student has not had prior experience with the accommodation, it is unlikely to benefit the student during assessment (Ysseldyke et al., 2001). In addition, teachers should be knowledgeable of, and have access, to state and district testing guidelines (Elliott, McKeivitt, & Kettler, 2002; Ketterlin-Geller et al., 2007).

Moreover, teachers need a basic understanding of educational measurement (Ketterlin-Geller et al., 2007). Teachers should be familiar with test and item characteristics for the statewide assessment. Teachers need to understand these characteristics to determine which accommodations the student needs to meaningfully access the test. If used appropriately, accommodations produce a valid estimate of the student's ability, which does not interfere with the construct being measured (Thurlow, Elliott, & Ysseldyke, 2003). Unfortunately, few teacher preparation

programs provide adequate instruction in assessment, measurement, or accommodations decision making (Stiggins, 1999; Thompson, Lazarus, Clapper, & Thurlow, 2006).

According to the recommendations in the Council of Chief State School Officers (CCSSO) accommodations manual, teachers also need to have a deeper understanding of the final step in accommodations decision making—evaluation (Thompson et al., 2005). For example, members of the IEP team, including teachers must be able to determine whether assigned accommodations are effective for an individual student. The CCSSO manual recommends that teachers collect student performance data on classroom assignments or formative assessments to evaluate accommodations use. Teachers then need to analyze the data to determine whether the accommodation is effective (i.e., helps the student demonstrate his or her knowledge and skills) (Thompson et al., 2005). Accommodations used on statewide tests for accountability should also be examined. Members of the IEP team may conduct direct observations of students, interview test administrators, and interview students about their testing experience (see Minnesota Department of Education, 2008-2009). Compiling evidence from a variety of sources is important for making good accommodations decisions. In addition, evaluating accommodations at the individual and systems level will help identify topics for future teacher professional development (Thompson et al., 2005).

Although teachers have knowledge gaps on accommodations for instruction and assessment, teachers may already possess some of the knowledge or skills needed to select accommodations. For example, general and special educators are likely to know an individual student’s learning style (Helwig & Tindal, 2003). Special educators, in particular, have extensive knowledge and experience working with diverse learners (Bolt & Quenemoen, 2006). Thus, special educators are likely to have a good understanding of a student’s learning needs.

Teachers of students at different grade levels may also have unique areas of expertise, or needs for professional development, related to accommodations. For example, middle and high school teachers are more likely to consider a student’s program or placement when making accommodations decisions (Lazarus et al., 2006). However, accommodations should be selected on a “case-by-case basis” (p. 82; Elliott et al., 2001), rather than at the group or systems level (Shriner & Ganguly, 2007). Professional development for middle and high school teachers needs to focus on this knowledge gap. Middle and high school teachers should also encourage students to become more involved in the decision-making process (Thurlow et al., 2003).

Finally, practical and logistical factors should be considered. Training needs to be provided in a timely manner (i.e., well before test day), and should not overwhelm educators with too much information (Crawford et al., 2002; Lazarus et al., 2006). In addition, teachers may require training on how to implement accommodations and prepare for challenges that may surface on test day (Bolt & Thurlow, 2004; Shriner & DeStefano, 2003).

### **III. Research-based Models of Teacher Professional Development**

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To outline a model for accommodations training, it is helpful to first examine research-based models of professional development. Each of the following models has implications for teacher professional development. Although several models will be presented, they can be divided into three major categories: project-based learning, case-based instruction, and Communities of Practice.

#### **Project-based Learning**

Several models have established that effective teacher professional development must occur in an applied setting. That is, it must be connected to the teacher's context and practice. Guskey (1986) conceptualized a model of professional development wherein newly learned concepts would be applied in the teacher's own classroom. Specifically, Guskey maintained that teachers must observe the relative success of the practice, especially with regard to student learning, before they accept it as part of their professional repertoire.

Clarke and Hollingsworth (2002) reconceptualized Guskey's (1986) model. They proposed that teacher learning can be separated into four domains: external, personal, practice, and consequence. The external domain refers to the concepts presented during in-service sessions with trainers and staff. The personal domain consists of teacher attitudes or beliefs. Finally, the practice and consequence domains indicate how concepts may be applied and subsequently assessed in the classroom.

According to Clark and Hollingsworth (2002), each of the domains is mediated by reciprocal processes that eventually lead to changes in the teacher's knowledge or beliefs. First, teachers apply what they have learned in the classroom. Second, teachers assess the outcomes and evaluate the relative success of the new practice. Of the four domains, the consequence domain seems to be particularly important for understanding changes in teachers' attitudes, beliefs, or practices.

Both Guskey (1986) and Clarke and Hollingsworth (2002) provide the theoretical foundation for project-based learning (Frey, 2009). Blumenfeld (1991) described project-based learning as an instructional strategy in which participants, whether students or teachers, learn by engaging in the problem-solving process. Participants must produce artifacts that illustrate this process, from the earliest stages to the end product. More importantly, the problem must address real-life issues in applied settings. Project-based learning may be an effective component of some

teacher training initiatives. For example, Howard (2002) found that project-based learning was effective for helping teachers use technology in the classroom.

## Case-based Instruction

Like project-based learning, case-based instruction (CBI) provides teachers an opportunity to apply what they have learned. The difference is that CBI provides more support and scaffolding (Andersen & Baker, 1999), which may help teachers engage in the problem-solving process. As defined in Kagan (1993), classroom cases typically are narratives that depict a particular problem. The problem may parallel a real-life teaching situation (Elksnin, 1998). Cases also reflect the generic and situation-specific nature of a teacher's practice (Kagan, 1993). Through case-based instruction, teachers are better able to apply general principles or theories to their practice. For example, cases have been used to help teachers integrate grade-level content standards into their teaching practices (Shulman, 2000).

Cases generally are discussed within small groups. Groups may include teachers from a variety of school contexts (Cutter, Palincsar, & Magnusson, 2002). Through discussion, teachers are exposed to alternate viewpoints (McNaughton, Hall, & Maccini, 2001). Group work and discussion typically are considered more important than arriving at a solution (Kagan, 1993). Teachers receive practice for solving "real world" problems (McNaughton, Hall, & Maccini, 2001), which may also help them develop generalizable skills (Elksnin, 1998). Cases often are combined with other instructional strategies for optimal learning (Anderson & Baker, 1999).

Historically, CBI was used in business education. It was later integrated into teacher education, but initially was met with limited success (Merseth, 1991). More recent research demonstrates some of the benefits of cases in preservice teacher education. For example, Elksnin (1998) surveyed special education teacher educators who used cases as part of their teaching. Although teacher educators cited the student's ability to apply classroom learning as a major benefit of case-based instruction, the ability to engage in higher-level thinking and demonstrate problem-solving skills were secondary benefits. The cases also resulted in increased participant collaboration and engagement. Cases, written as rich narratives of real-life teaching practice (Kagan, 1993), may also be more appealing for teachers than content instruction.

In other research, it has been shown that cases help educators become more reflective in their practice (i.e., they "look back, review the basis for decisions, and consider the impact of their actions," McNaughton et al., 2001, p. 90). Cases also provide an opportunity for collaboration (Cutter et al., 2002). This is an important benefit because teachers work in different contexts, with a variety of other teachers and staff. Further, case-based instruction may have an indirect

benefit for students. Students of teachers enrolled in a case-based training course demonstrated significant learning gains, and this finding was replicated for both low-achieving and special education students (Palinscar, Magnusson, Collins, & Cutter, 2001).

Although CBI offers important benefits, several challenges remain. Teacher educators cite the amount of time and resources devoted to developing cases as a major challenge (McNaughton et al., 2001). CBI also may consume more instructional time than traditional methods, and may lead to challenges in evaluating teacher learning (Elksnin, 1998). To address challenges associated with case development, Merseth (1991) recommended a centralized depository for high-quality classroom cases.

## Communities of Practice

CBI may be supplemented with teacher discussion and participatory learning (Cutter et al., 2002). This approach is referred to as a Communities of Practice (CoPs) model and originated from professions outside of education, including medicine and law (Mott, 2000). When combined with CoPs, the effectiveness of CBI may be enhanced, thereby providing support for integrating case-based instruction within CoPs.

Wenger (1998) identified key components of CoPs, including: (a) shared agenda and goals; (b) pre-defined roles for all members; and (c) shared products or artifacts generated by the community. CoPs are formed by individuals with shared interests and knowledge base. Members are likely to be, but not necessarily, part of a formal organizational structure (i.e., teaching department). They may conform to formal leadership roles within the organization, or they may form their own roles. Artifacts include publications or other written products, as well as routines, sensibilities, vocabulary, or styles (Wenger, 1998).

Benefits of teacher CoPs have been well documented. Within CoPs, teachers generate and maintain knowledge that applies to the local (e.g., classrooms, schools) as well as the larger socio-political context (Cochran-Smith & Lytle, 1999). Thus, the knowledge and skills that teachers gain are inextricably tied to the settings in which they teach. As explained by Cochran-Smith and Lytle, CoPs are composed of novice and expert teachers who share experiences and work toward building a common discourse. CoPs also promote teacher exploration (Supovitz, 2002). Teachers may discover new styles or practices to which they otherwise would not have been exposed.

Another benefit of CoPs is increased accountability. As explained in Wineberg and Grossman (1998), CoPs “make teaching public” (p. 352) by exposing teachers to the practices of their colleagues. This is not only beneficial for maintaining teacher quality, but it is also enjoyable

for teachers. Teachers in existing CoPs have reported that they like the increased interactions with their colleagues (Supovitz, 2002). CoPs may have an indirect benefit for students. Teachers in CoPs model life-long learning skills that students may begin to imitate (Wineberg & Grossman, 1998).

For a CoP to work well, it must be well designed. For example, if membership roles within the community are not well-defined, it may lead to internal power struggles (Cochran-Smith & Lytle, 1999). School or district administrators may assist in determining some of these roles to prevent internal challenges. Administrators also may assist in providing teachers with time, resources, or connections necessary to promote CoP development (Parr & Ward, 2006).

## **IV. Online Teacher Professional Development**

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Teacher professional development can be provided with technology. According to Clary and Wandersee (2009) teachers prefer online learning because it can be accessed from various locations at times that are convenient. Although conclusive evidence for the components of effective online training has yet to be determined, there are indications that some elements of traditional professional development may be translated to an online platform (Whitehouse, Breit, McCloskey, Ketelhut, & Dede, 2006). Specifically, CBI and CoP models have been successfully incorporated into online teacher training (Whitehouse et al., 2006), and more recently, several online teacher training efforts also have included project based learning (e.g., Frey, 2009). This section describes how traditional models can inform online approaches, and may foreshadow what high-quality teacher professional development will look like in the near future.

### **Project-based Learning in an Online Environment**

Originating from the seminal work of Guskey (1986) and Clarke and Hollingsworth (2002), some models of online teacher professional development have included project-based learning. For example, Frey (2009) reported how special education teachers participated in an online course that included real-life application to their classroom settings. That online course provided instruction on how to address the academic needs of at-risk students. Teachers had the opportunity to practice some of these skills (e.g., developing individualized interventions, progress-monitoring) with actual students. Teachers also observed the effect of the interventions, which may have increased their willingness to learn about new instructional strategies (Frey, 2009).

Project-based learning may be supplemented with reflective activities, including journaling. When teachers think more deeply about their experiences, they become more aware of their

own competencies (Doering, Veletsianos, Scharber, & Miller, 2009). Online courses that provide teachers with applied experiences, and an opportunity to journal about those experiences, may lead to better teacher and student outcomes (Frey, 2009; Duran, Runvand, & Fossum, 2009).

While it is important to demonstrate course effectiveness, it may be equally important to survey teachers' preferences about online learning. Teachers may prefer applied experiences to experiences using sophisticated technology, which they may perceive as less practical (Clary & Wandersee, 2009). When evaluations were conducted of online courses with less emphasis on application, it was found that teachers requested experiential learning to be included in future iterations (Gu, Zhang, Lin, & Song, 2009). Thus, it appears that although teachers value the practical advantages of online learning, they also prefer courses with real-life, classroom application.

### Online Case-based Instruction

As an alternative to project-based learning, some have suggested using CBI for pre or in-service teacher training (Anderson & Baker, 1999). Despite the fact that CBI has yet to be fully explored within an online environment, it shows considerable promise. Online CBI has been shown to increase knowledge of instructional strategies for teachers of all experiences and backgrounds (Fitzgerald et al., 2009). It also has been found to influence teacher behavior. For example, Landry, Anthony, Swank, and Monseque-Bailey (2009) found that teachers used research-based practices with more frequency after completing online case studies.

There may be several explanations for the demonstrated effectiveness of online CBI. Koc, Peker, and Osmanglu (2009) proposed that cases, especially those with embedded video content, help teachers to make “theory-practice connections.” In this way, teachers relate course concepts to elements of the classroom case. Teachers indicated that it was useful to “see” how some of the concepts might be realized in the classroom (Koc et al., 2009). Cases may also help teachers reflect upon their own teaching practices. Using “VideoPaper” technology, Hauge and Norenes (2009) recorded teachers in real-life classroom scenarios. Short video clips were presented in small groups. It was found that teachers analyzed and reflected on their teaching practices during group discussions.

CBI may be supplemented with role-playing exercises. For example, McLinden, McCall, Hinton, and Weston (2010) described how teachers of students with visual impairments role-played problem case scenarios within an online environment. The problem cases simulated authentic work experience. After teachers were given a scenario, they were asked to collect information, identify a solution, and report to a fictitious supervisor. Most teachers indicated that they liked

the role-playing component, but little evidence was provided to suggest that cases helped participants to learn effective teaching strategies.

Modeling, when combined with CBI, may also be an effective component of online learning. For example, Landry et al. (2009) provided video-taped modeling for teachers enrolled in an online training course. The videos “allowed teachers to see examples in realistic contexts that were relevant to their classroom experiences” (p. 452; Landry et al., 2009). Teachers enrolled in the online course demonstrated higher quality teaching practices than teachers without online instruction. In addition, students of teachers enrolled in the online course made significant learning gains in key pre-reading areas (i.e., phonological awareness; Landry et al., 2009).

Finally, online cases may include a variety of supplemental resources. Although many contain embedded video content (e.g., Hauge & Norenes, 2009; Koc et al., 2009; Landry et al., 2009), they may also contain expert commentary, information databases, case records, reflective prompts, and interviews with students or educators (Fitzgerald et al., 2009). Other cases, including hypermedia cases, provide textual resources, research citations, links to related cases, and links to published information specifically for teachers (Powell, Diamond, & Koehler, 2010).

Care should be taken not to overwhelm teachers with embedded content. Teachers demonstrate a preference for key summaries or bulleted points, rather than an excess of video or textual resources (Powell et al., 2010). Other research has identified a need for knowledge management (i.e., online searching or related functions) to assist teachers in navigating the online environment (Hatch & Grossman, 2009; Gu et al., 2009).

## Virtual Communities of Practice

As discussed previously, Communities of Practice (CoP) may be used to enhance case-based instruction. The online equivalent of CoP has been termed Virtual Communities of Practice (VCoP) (Keown, 2009). Similar to in-person CoP, the virtual version may include teachers of varying levels of experience who hold different roles within the community (Gutierrez & Bryan, 2010; Keown, 2009). VCoPs may lead to better learning outcomes when teachers of different educational or experiential backgrounds are included (Duran et al., 2009; Fitzgerald et al., 2008), and when membership is neither too small nor unwieldy (Keown, 2009). Moreover, VCoPs with expert teachers in mentorship roles are successful in helping novice teachers improve the quality of their teaching practices (Gutierrez & Bryan, 2010).

The ability to communicate quickly and with ease is an important component of VCoP. Online communication is either synchronous (in real time) or asynchronous (delayed). In an online environment, synchronous communication permits instructors to provide immediate, relevant

feedback, which is generally preferred by teachers (Gu et al., 2009; Marrero, Woodruff, Schuster, & Riccio, 2010). Another training model is to provide “virtual office hours” with live instructor support (Trautmann & MaKinster, 2010). Live communication may also spur development of VCoPs because it provides a vehicle for sustained interaction (Marrero et al., 2010).

Synchronous communication may be difficult from a logistical perspective because all participants must be available at the same time (Russell, Kleiman, Carey, & Douglas, 2009). Asynchronous communication can work well and may be preferable, especially when practical or logistical challenges prevent live communication. In an online setting, teachers have demonstrated an ability to maintain topical, in-depth discussions asynchronously (Koc et al., 2009). The quality of asynchronous discussion is mediated by the course instructor. Several strategies have been shown to be effective. For example, instructors should encourage participants to ask questions, reflect on their own experiences, or highlight important (but unrecognized) issues (Kale, Brush, & Saye, 2009).

Rather than communicating exclusively in a synchronous or asynchronous environment, it may be possible to combine both forms of communication. McLinden et al. (2010) found that online training that invited participants to post messages on a bulletin board or to chat synchronously received favorable reviews from teachers. Online training with more options may also lead to better outcomes. For example, Trautman and MaKinster (2010) offered live and delayed communication with positive learning outcomes for teachers enrolled in the course.

As a final consideration, online forums or VCoPs may benefit from a facilitator who is independent from the course instructor. Teachers may find the added support helpful in maintaining online discussions (McLinden et al., 2010), but it is not without challenges. Facilitators who provide too much support, or who provide answers rather than encourage participants to develop their own responses, may actually limit the quality of teacher discussions (Kale et al., 2009; Mitchem et al., 2008).

Teachers with various backgrounds, including general and special educators, teachers of different grade levels (e.g., preschool, elementary, secondary), and different content areas (e.g., English language arts, mathematics, science, geography) have participated in high-quality online professional development, resulting in generally positive outcomes for teachers and students. Online modules, including those mentioned in earlier sections of this report, have been used to educate teachers on many topics, including mathematics teaching strategies (e.g., Koc et al., 2009), and early literacy interventions for at-risk students (e.g., Landry et al., 2009). Because high-quality online training has demonstrated its effectiveness with teachers of various backgrounds and stages of professional development, it may also be applied toward helping teachers make better decisions about accommodations.

## Discussion

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Teachers play an important role in making decisions about students' accommodations for instruction and assessment. The literature suggests that both special and general education teachers would benefit from professional development on collaboration and accommodations decision making. The literature also indicates that although teachers play a major role in the decision-making process, there are gaps in their knowledge. Some of these gaps may be due to challenges in providing traditional professional development, including cost and teacher's limited time. A potential solution is to provide online professional development for teachers.

In an online environment, professional development can be accessed in new and different ways. Case-based instruction, for example, may incorporate multimedia formats including text, audio, and visual. Participants may also access project-based learning and Communities of Practice (CoPs) in new ways. For example, teachers participating in project-based training may record their experiences online. And, teachers can share these experiences in synchronous or asynchronous environments.

Although online learning should reflect the characteristics of high-quality teacher professional development, they are not one size fits all. Some users may prefer online environments with multimedia cases and others may prefer opportunities for online discussion or journaling. User preferences should be weighed in the development of online training.

Online training can help teachers develop accommodations decision-making skills. This report reviewed the literature on teacher professional development on accommodations and online training. A limitation of this review is that much of the literature on this topic does not come from research studies, but rather from a variety of sources including policy papers and state manuals.

According to Schlager and Fusco (2003), often the "cart is put before the horse" and online training is developed without careful consideration of what the literature says about effective teacher professional development. Hopefully, this review of the literature will bring us closer to answering the question: How can the reach and power of the Internet contribute to teacher's professional development on accommodations decision making? Then developers of online training on accommodations decision making will put the "horse before the cart" to develop high-quality training.

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