

Assessment for learning in the classroom: Barriers to implementation and possibilities for teacher professional learning

**Christopher DeLuca, King Luu, Youyi Sun
and Don A. Klinger**

Abstract

Assessment for learning (AfL) has been touted as one of the most promising pedagogical approaches for enhancing student learning. Research suggests that engaging students in AfL helps to improve their achievement, develop metacognition and support motivated learning and positive self-perceptions. However, despite these promises, there have been notable barriers impeding teachers' use of AfL in their classrooms. Time and class sizes; conceptual confusions related to AfL; perceived misalignment between system priorities and classroom assessment practices; and a lack of effective models for professional development on assessment have all been cited as critical challenges in promoting the implementation of AfL in classrooms. Given these challenges, in this paper we ask: What would it take to make AfL integration possible and practical within the current context of education? In response to this question, we assert the benefits of using contemporary approaches to teacher professional learning that explicitly address gaps and challenges in AfL implementation. Further, we provide grounding for a programme of research in developing teachers' assessment capacity by first summarising challenges to the integration of AfL and then exploring potential directions for professional learning in this area.

Assessment for learning (AfL) is currently being touted as one of the most promising pedagogical approaches for enhancing student learning. Since Black and Wiliam's (1998) literature review on AfL demonstrated potential achievement gains with mean effect sizes of 0.4–0.7 standard deviations, there has been a growing body of literature based on studies

from countries in North America, Western Europe and Australasia to support AfL as a potentially highly effective pedagogical practice (e.g., Hume & Coll, 2009; MacPhail & Halbert, 2010; Marshall & Drummond, 2006). While the practice and theory of AfL continue to evolve, in this paper we use the Assessment Reform Group's (2002) articulation that asserts AfL as a process of actively engaging students in assessment processes (including self-, peer and instructor-based assessment) throughout learning with the goal of improving achievement, developing metacognition and supporting motivated learning and positive student self-perceptions. In addition, AfL processes may support the development of students' self-regulation, a key component of promoting independent learning (Assessment Reform Group, 2002).

While there is growing evidence that these goals can be achieved, there have also been notable critiques and identified barriers to AfL, impeding teachers' use of AfL within classrooms. For example, Perrenoud (1998) argued that the promises and goals of AfL are the result of multiple interrelated factors, not solely the use of AfL practices. Perrenoud noted the importance of other classroom activities and structures such as management approach on student metacognitive and self-regulation development. Bennett (2011), in a review of AfL, has identified a number of issues that limit its effectiveness, including how it is defined, how its demands can be supported and the varying contexts in which it operates. Practical barriers, including time and class sizes (Mabry, Poole, Redmond, & Schultz, 2003; Torrance & Pryor, 2001); teacher misconceptions of AfL philosophy, theory and practice (Brown, Kennedy, Fok, Chan, & Yu, 2009; Hargreaves, 2005); perceived misalignment between system accountability priorities and teachers' assessment practices (Gardner, 2006; MacLellan, 2001); and the lack of effective models for professional development on assessment (Lee & Wiliam, 2005) have also been cited as critical challenges in promoting AfL. Given these identified barriers, we ask: What would it take to make AfL integration possible within the current context of education?

We believe that the response to this question lies in developing teachers' capacity for integrating various forms of assessment into their classrooms. As such, we follow James and Pedder (2006) in asserting that

a potential way forward in realising the promises of AfL is to research structures for educating teachers, both in-service and preservice, about the complexities, challenges and possibilities for assessment integration within the educational context in which they work. In particular, there is an established need to examine how contemporary professional development models and current approaches to adult learning can support teachers' negotiation of the challenges facing AfL implementation and use (James & Pedder, 2006). Accordingly, the aim of this paper is to first identify the dominant challenges facing AfL integration and then to identify effective contemporary models for professional learning rooted in adult learning theory in order to provide a baseline for future research and assessment education initiatives. Through this work, we hope to invigorate inquiry into the ways that teachers can learn to effectively engage an assessment programme that promotes student learning within the current climate of education.

Barriers to assessment for learning integration

The current accountability and standards-based contexts of most educational systems have resulted in greater reliance on classroom and large-scale assessments (Adams & Kirst, 1999; Klinger, DeLuca, & Miller, 2008; Levin, 1998). More importantly, teachers and principals are increasingly expected to use assessment information to guide school improvement efforts and differentiate instructional practice. Within this context of education, traditional summative assessments or assessments of learning (AoL) continue to dominate in classrooms (Shute, 2008). Moreover, such educational contexts present several barriers to the integration of AfL within classroom teaching and learning. Based on current research, we synthesise barriers to AfL implementation to provide a foundation for exploring possibilities for greater AfL integration. Specifically, these barriers are: (a) misalignment in educational and assessment priorities; (b) conceptual confusions; (c) differences in letter and spirit of AfL; (d) teachers' and students' perceptions of AfL; and (e) practical barriers to integration. It is important to note that, while these barriers are described individually, in practice, they are interrelated.

Misalignment in educational and assessment priorities

Lingard, Mills and Hayes (2006) argued that assessment is not a neutral process or simply an educational measurement tool; rather, it reflects the purposes and priorities of schooling. As with other classroom assessment processes, the use of AfL can only be understood “by taking account of the social, cultural, economic, and political contexts in which it operates” (Gipps, 1999, p. 355). In the current context of accountability and standards-based education, summative forms of assessment tend to drive curriculum reform and instruction (Madaus & Kellaghan, 1992; Shute, 2008). For example, Ball (2004) identified that the national assessments for accountability and monitoring purposes in England limited the use of diverse assessment approaches by teachers in their classrooms. Similarly, in a US-based study, Popham (2008) found that teachers abandoned AfL practices in their classrooms because they felt constrained by state assessments under No Child Left Behind legislation. Darling-Hammond and McCloskey (2008) further acknowledge that the assessment system in the US overemphasises externally developed tests while deemphasising AfL processes. In a cross-cultural survey, Brown et al. (2009) found significant differences in assessment practices and beliefs held by Hong Kong teachers, as compared to teachers in New Zealand and Australia, noting that broader cultural norms that focus on examinations are part of school culture in Hong Kong and impede assessment reforms that emphasise AfL. As such, the current emphasis on summative forms of assessment and large-scale assessments worldwide suggests a perceived misalignment between systemic assessment priorities and AfL integration. This misalignment is paradoxical as engaging AfL in classroom teaching and learning likely serves to enhance student achievement on summative assessments (Gardner, 2006). Despite this finding, AfL continues to be less emphasised in relation to summative forms of assessment within schools and districts, creating a central barrier to AfL implementation and use. This barrier is in part due to continued misconceptions about AfL theory and practices.

Conceptual confusions

Despite researchers' attempts to clarify the link between AfL and AoL, one of the central barriers in AfL integration is the misconception that AfL and AoL are disconnected processes (Bennett, 2011; Gardner, 2006). Teachers often perceive AfL as separate from other forms of assessment, teaching and learning, and may consider AfL practices to be notably different from summative forms of assessment (e.g., quizzes instead of unit tests). These misconceptions result in lower adoption of AfL and do not address the underlying pedagogical differences and uses of AfL. Moreover, this conceptual confusion may be perpetuated because AoL is prioritised in state, provincial and national assessment systems. In addition, teachers are inclined to focus on AoL as results from these assessments are used to communicate student achievement, form part of the students' academic record and are used as a measure of school progress and teacher effectiveness within the accountability context of education mentioned above.

Taras (2007) further argues that although AoL is perceived to be different from AfL, these differences have not been clearly or unanimously articulated. Teachers may perceive AoL as separate from AfL, thus requiring repeated assessments in the classroom, by conducting assessments for learning and then again for grading. Teachers may be disinclined to use AfL because of the extra time commitments it requires. If AfL is essentially AoL, with feedback to direct teaching and learning, then teachers need to be aware that the two forms of assessment are more closely related than they appear. The educational community needs clarification on this conceptual confusion, with an emphasis on the similarities between AfL and AoL, if teacher buy-in to the philosophy of AfL is to be attained.

Hargreaves (2005) examined how teachers and principals conceptualised AfL to derive how assessment supported diverse conceptions of learning. The analyses revealed a duality in how AfL was conceptualised: on one end, teachers conceived AfL as teacher-centred and objective-based, harkening back to early forms of formative assessment in which assessments were done to students to provide the teacher with feedback

to improve his or her instruction. In this view of traditional formative assessment, students would not participate in assessing their own learning or in using assessment results to guide their future learning (McMillan, Hellsten, & Klinger, 2010). This conception of AfL was linked to a view of learning as an external process that was reliant upon teacher transmission of knowledge. Teachers who espouse this belief of learning view themselves as responsible for shaping students' learning and monitoring their progress. In contrast, some teachers conceived AfL to be student-centred with peer, self- and instructor feedback contributing to the scaffolding and progress of learning. This more contemporary view of AfL was supported by a social constructivist view of learning in which student achievement was situated in and dependent upon the social context of learning and based on students' experiences (Black & Wiliam, 2009; Shepard, 2000). To wit, students take control of their own learning through assessment while the teacher's role is to offer structures and support for engaging in AfL.

Differences in letter and spirit of assessment for learning

Even if teachers are committed to the principles of AfL, what they do in their classrooms is largely dependent upon their broader educational beliefs. Evidence suggests that some teachers integrate AfL in a literal and procedural way, while others adopt a philosophy towards education that integrates assessment into their conception of teaching and learning (Marshall & Drummond, 2006). Marshall and Drummond examined ways in which teachers enacted AfL in their classrooms. Teachers whose beliefs followed the spirit of AfL valued student involvement in learning and assessment, thus making learning explicit and promoting learner autonomy. In these contexts, opportunities were given for students to improve their performance through activities such as establishing criteria, evaluating their performance using criteria and integrating peer feedback. Further, teachers saw their role in this process as a motivator and facilitator to students' learning. Similarly, Willis (2010) examined the implementation of AfL principles within the context of three Australian classrooms, finding that when AfL was adopted with a spirit of promoting participation, it served to enhance the learning environment and contribute to student achievement. Specifically, Willis noted that shifting teachers' perceptions of AfL as an

approach to teaching rather than a series of prescribed assessment steps enabled students and teachers to develop a shared understanding of teaching and learning, leading to the development of a participatory community of practice within the classroom.

In contrast, teachers who followed the letter of AfL tended to ask closed questions, thus preventing students from forming connections between ideas and limiting the quality of student responses. While these teachers may wish to adopt a different approach to teaching, their attitudes restricted their ability to make progress. Further, they also expressed a “sense of ownership and responsibility” to assist and assess students (Marshall & Drummond, 2006, p. 146), which meant that the benefits of AfL for student autonomy were largely absent. These teachers continued to view their role as the assessor of student learning. Marshall and Drummond (2006) asserted that teachers adhering to the letter of AfL may be familiar with the assessment techniques, but may not fully understand the rationale for using and integrating these techniques into teaching and learning. Consequently, AfL was implemented in a step-by-step fashion with few opportunities to integrate feedback into learning.

Perceptions of assessment for learning

The integration of AfL is hindered by perceptions regarding the value of AfL to support teaching and learning. Both students and teachers may hold negative perceptions based on their previous experiences with AfL integration or earlier notions of formative assessment. Further, the misconception that AfL and AoL are disconnected processes may also reduce the perceived value of AfL. In particular, in a learning environment that centers on accountability, students may choose to adopt an approach known as *learned dependence*. Yorke (2003) defines learned dependence as a status acquired by students to rely on the teacher “to say what has to be done and does not seek to go beyond the boundaries that he or she believes to be circumscribing the task” (p. 489). Learner dependence encourages teachers to use a transmission model of education. As articulated by Hargreaves (2005), such an approach to education reduces the perceived value of AfL. Hence teachers are less likely to adopt this practice within the context of learner dependence.

In addition, teachers' negative perceptions of AfL may be shaped by their own experiences of assessment as students (Harrison, 2005). As AfL has yet to become seamlessly integrated into teaching and learning processes, many teachers have not had positive personal experiences with this practice. As such, teachers continue to treat assessment practices either formatively or as summative, isolated tasks. Undoubtedly, while teachers are constantly exposed to new ideas, "considerable effort, perseverance, and trust" is required to make AfL a complete part of their practice (Harrison, 2005, p.255). Thus teachers need to experience positive instances of AfL integration in order for it to influence their practice; currently, teachers widely base their use of AfL on their perceptions of AfL rather than on positive experiences of AfL.

MacLellan (2001) surveyed teacher candidates and faculty members at one higher education establishment in the UK to identify perceptions from each regarding the purpose of assessment. Faculty member responses suggested that a full range of assessment practices were used, with the purpose of motivating students and evaluating teaching quality; in contrast, teacher candidate responses suggested that formative assessment was not used as often as staff perceived, and, in instances where it was used, were not beneficial to their learning and were based on implicit assessment criteria. The disconnect suggests that faculty members' use of AfL was incomplete even though they had positive impressions of these practices, and prevented students from participating in the feedback process that is valued in learning. MacLellan's finding reinforces the notion that preservice teacher candidates may have limited experiences of effective AfL integration within their own learning and thus they may be less likely to adopt this approach as beginning teachers.

Practical barriers to integration

Studies on AfL integration have considered practical constraints such as time, class size and resources on teachers' adoption of AfL practices. The shortage of time is frequently mentioned in research on changing assessment practices (Torrance & Pryor, 2001). Specifically, teachers believe that traditional forms of assessment are more time efficient and have more value because they serve summative requirements and

accountability demands (Hargreaves, Earl, & Schmidt, 2002; Mabry et al., 2003). Even among those teachers who appreciate the potential of AfL to positively influence student achievement, there are concerns that AfL demands too much class time to integrate and that AfL implementation limits the amount of curriculum teachers can cover within their programme (Morgan & Watson, 2002). Carless (2005) noted that teachers believed AfL was good in theory, but that it was not practical to implement, especially within a context of competing curriculum demands. This notion contributed to low adoption rates of AfL in the classroom.

Duncan and Noonan (2007) argued for the importance of knowing how teachers' assessment strategies are influenced by types of classroom learning conditions (i.e., class size and resources). However, their actual research did not provide clear evidence to support the position that teachers with smaller class sizes tended to use AfL practices more than teachers of larger classes. This finding may have been limited due to small effect sizes within this research, suggesting that further research is needed in this area for more conclusive evidence. A second aspect of classroom learning conditions that often impacts the integration of new educational policies and practices is resources (i.e., funding, personnel and technology). It is consistently claimed in the literature that AfL integration requires notably few additional resources (Black, Harrison, Lee, Marshall, & Wiliam, 2003). The majority of classroom strategies associated with AfL focus on student and teacher interaction rather than on the use of sophisticated resources or technologies. As such, like class size, resources do not appear to limit the integration of AfL in teaching and learning. Regardless, additional research has been suggested into the practical barriers to AfL integration so that these barriers can be sufficiently considered when constructing initiatives to better support teachers in AfL implementation.

Possibilities for assessment for learning integration

While the challenges delineated above limit the perceived viability of AfL integration within the current standards-based context of schooling, we assert that possibilities exist by leveraging teacher professional learning to enhance AfL integration. We make this assertion because these barriers

tend to fall within teachers' capacity to effect change within their classroom assessment programmes, with the exception being the misalignment between educational and assessment policies and priorities. However, this barrier can be addressed through a reconceptualisation of the distinction between AfL and AoL. As Taras (2007) contends, the separation between AfL and AoL largely exists only in theory and is artificial in practice as teachers use both AfL and AoL to inform teaching and students' learning as well as to evaluate student achievement. Emphasising the differences between AfL and AoL only serves to promote the misperception that these are different processes that demand additional time and effort on the part of teachers. This conceptual confusion results in teachers being less likely to adopt AfL as a strategy in their classrooms (Taras, 2007). Paradoxically, the separation of AfL and AoL also negates the central message of AfL, that "overall standards and individual performance may be improved by actually emphasizing formative [AfL] assessment" (Gardner, 2006, p. 198).

Given that teachers are in a position to effect change in their use of assessments, we believe that developing teachers' capacities for integrating various forms of assessment into their programming remains the most viable way to enhance the use of AfL in classrooms. In response, we consider those empirically supported approaches to teacher professional learning in order to identify potential models for educating teachers about assessment integration. We begin by broadly exploring the structures and challenges associated with traditional approaches to professional development. We then build on traditional models to examine contemporary adult learning theory and the essential elements of current approaches for educating teachers. In reviewing contemporary professional learning approaches, we integrate research on assessment education initiatives in order to begin to connect assessment education research with professional learning literature. Our aim in looking at this connection is to construct a foundation for research in teacher assessment development that is based on effective professional learning models.

Traditional teacher professional development

Professional development (PD) for teachers originated in the early 1940s, designed to address the needs of unqualified or uncertified teachers, but

is now widely recognised as a means of improving the performance of all school personnel (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). While PD is integral to the teaching profession of today, there remains a great deal of variation in the structure, format and uses with current practice that do not necessarily align with good professional development models. This misalignment results from the perpetuation of traditional, less effective approaches to PD.

Since the 1990s, a great deal of research has cautioned against the use of some of the more popular, traditional forms of PD, which include workshops, conferences and the use of guest speakers to guide the application of new concepts (e.g., Darling-Hammond et al., 2009; Fullan, 1993). Critiques have focused on the problematic underlying assumptions that guide these forms of PD (e.g., Bennett, 2011; Joyce & Showers, 2002). Specifically, these assumptions about teacher development include: (a) expert-based transmission of knowledge; (b) decontextualised knowledge acquisition; and (c) product-focused and short-term results.

Assumption 1: Expert-based transmission of knowledge

The use of expert-based, “how-to” workshops as a method of impacting teacher behaviour was a common PD structure based on the assumption that teacher improvement could be achieved through vertical transmission of ideas from experts to teachers (Park, Oliver, Johnson, Graham, & Oppong, 2007; Sparks & Hirsh, 1997). This format appears to be largely ineffective, because it is driven by a deficit view of teachers and a belief that changes in practice can occur through a passive manner of knowledge transmission (Baron, 2008). In this form of PD, the focus is on what is being taught by the experts rather than on what is being learned by the teachers. Based on their extensive review of teacher PD in the US, Darling-Hammond et al. (2009) reported that PD of 14 hours or less showed no effect on student learning, since the intensity and duration of programmes were too limited for a deep and thorough discussion of concepts. Moreover, these programmes tended to take a “top-down” approach that often resulted in low coherence between the topics being discussed and teachers’ own goals for learning (Penuel, Fishman, Yamaguchi, & Gallagher, 2007).

Assumption 2: Decontextualised knowledge acquisition

Traditional PD models have tended to operate on a decontextualised model of knowledge acquisition (Darling-Hammond et al., 2009; Hargreaves, 2007), generally requiring teachers to attend sessions outside of their classroom, where they passively receive advice that they can implement on their own. This off-site, decontextualised model of PD has been perceived as disconnected from teachers' practices (Hargreaves, 2007) and "external to the ongoing work of teaching, something that one 'does' or that is 'provided' in the form of activities or events" (Little, 1999, p. 246). This approach assumes that PD and teachers' practices are directly related, and further assumes that teacher performance can be improved when individuals learn how to do their jobs better. However, this model fails to recognise the organisational constraints and conditions specific to classroom contexts, which make it difficult for teachers to apply learning from decontextualised professional development activities within their own contexts of practice.

Occasionally, traditional forms of PD focus on the transfer of content, leaving the implementation of knowledge and skills to the individual teachers, often with little (if any) follow-up or support (e.g., Hargreaves, 2007; Wylie & Lyon, 2009). Teachers are left to negotiate how learning from their PD sessions might work within their own context of practice, and problems might occur even when teachers are excited and motivated to implement what they have learned upon return to their classrooms. Ideas and skills from PD compete with more urgent professional duties (Lieberman, 1995); in addition, the lack of follow-up support at school may mean there is little change in teachers' practices (Speck & Knipe, 2005).

Assumption 3: Short-term results and product-focused learning

A final criticism of traditional approaches to professional learning centres on the product-focused and short-term nature of the results (Hargreaves, 2007). This criticism is linked to the previous two assumptions, as a short-term focus is in part a result of a content-based, decontextualised model of professional learning. Since the desired end result is typically the acquisition of content, traditional approaches to PD fail to acknowledge that adults actually learn through sustained engagement in deep learning

(e.g., Knowles, 1980, 1984; Schön, 1983, 1987). Further, attention is typically placed on topics most relevant to system priorities rather than on dilemmas identified by the learners themselves.

Traditional professional development approaches have been criticised for lacking the time and support that is needed for teachers to develop strong pedagogical skills. The failure to address the context of individual schools, the specific learning needs of teachers and the sustained nature of adult learning widely contribute to the ineffectiveness of these approaches. The majority of current research on teacher PD recommends a shift away from top-down models that are disconnected from teacher practice, towards a more collaborative, community-oriented approach.

Contemporary professional development

In place of traditional PD is a call for models of PD that focus on teachers as learners while promoting collaborative, contextualised and skills-based learning (e.g., Cochran-Smith, 2006; Darling-Hammond et al., 2009). In a systematic review of contemporary professional development approaches, Luke and McArdle (2009) suggested that teacher learning must work through six phases that align teacher-learning needs with system priorities. Specifically, their six phases were: (a) identifying policy priorities; (b) reframing and specifying educational issues and goals; (c) identifying teacher cohorts for focused PD based on need; (d) categorising teacher learning needs, previous knowledge and experiences; (e) selecting a PD approach that works within teachers' roles and responsibilities; and (f) conducting an evaluation of the PD experience. Underpinning these phases are several tenets of effective professional learning. These tenets recognise the importance of considering the teachers as learners within a system of competing priorities. A number of contemporary PD approaches can work within a contemporary model of PD. Examples include action research (e.g., Marczely, 1996), coaching (e.g., Costa & Garmston, 1994), mentoring (e.g., Feeney-Jonson, 2008), peer observation (e.g., Allen & LeBlanc, 2005) and communities of practice (e.g., McLaughlin & Talbert, 2006).

Many researchers have proposed models outlining the critical components of effective professional learning within these activities (e.g., Darling-Hammond et al., 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001).

Accordingly, in this section, we synthesise these components and discuss three core elements commonly considered as essential for effective professional learning. We consider these elements of adult professional learning alongside current assessment education research and initiatives to provide a theoretical foundation for enhancing teachers' capacity for AfL integration and use.

Essential element 1: Teacher as active learner

In his seminal work on adult learning, Knowles (1980, 1984) challenged the pedagogical model of learning that viewed adult learners as passive recipients primarily motivated by external pressures. He based his theory of andragogy, which considered adults as active learners, on five key assumptions: (a) adults are viewed as self-directed learners; (b) adults bring with them a wealth of experience and knowledge and adults themselves are often the richest resource for one another; (c) adults become ready to learn “when they experience a need to know or do something in order to perform more effectively in some aspect of their lives” (Knowles, 1980, p. 11); (d) an adult's orientation to learning is life-centred, task-centred or problem-centred and “for the most part, adults do not learn for the sake of learning; they learn in order to be able to perform a task, solve a problem, or live in a more satisfying way” (p. 12); and (e) internal forces, such as increase in self-esteem or greater self-confidence are more potent motivators for learning than external forces.

Coinciding with Knowles' (1980, 1984) research, studies have been conducted into the depth and degree of learning that emerges when adults actively engage in learning. Based on their work with Swedish university students, Marton and Säljö (1976) moved beyond the study of how much was learned and focused on what was learned. They identified two levels of processing: surface-level and deep-level processing. In surface-level processing, the learner tends to focus on the content itself and learning is conceptualised as rote memorisation. Deep-level processing, on the other hand, focuses the connections between new knowledge and previous experiences. In deep-level processing, theoretical ideas are related to everyday experiences, with learning driven often by internal factors (Atherton, 2009).

The pairing of Knowles' theory of andragogy and understandings of deep and surface learning holds important implications for teacher PD. As identified by Atherton (2009), adults are more likely to be motivated to engage in deep learning through collaborative and context-based inquiry. This finding supports the main criticisms of traditional forms of PD, namely the failure to address issues of concern to teachers and the decontextualised nature of the activities. When the content of professional learning is presented with little regard to the context of the classroom, the cognitive structures that arise from the activity may be unstable or have little longevity. As a result, teachers may struggle to apply or implement their learning once they return to the classroom. Therefore, contemporary approaches to PD suggest that teachers need to actively engage in learning, which involves: (a) recognising that teachers may be able to learn more from each other with guidance from external resources and supports (i.e., expert input but not expert led); (b) acknowledging the value of learning that can occur in schools when teachers address authentic problems related to their daily experience; and (c) fostering a collaborative atmosphere based on mutual trust, respect and support as teachers work together to solve practice-based problems.

The Learning How to Learn (LHTL) project provides one example of how this principle was endorsed within the context of assessment education for in-service teachers (MacBeath, Pedder, & Swaffield, 2007). The LHTL project was a professional learning initiative across 40 schools in the UK, aiming to develop and extend teachers' use of AfL to improve students' understandings of how they learned. In particular, the programme involved an initial session held by researchers, with additional optional workshops for teachers and school administrators. A consultant was designated to each school, and cross-school meetings were established for school administrators to help support the implementation of AfL practices and encourage professional dialogue. Further, a website was created to enable communication and exchange between teachers about ideas and experiences of implementing principles of AfL. Research on this PD programme by MacBeath et al. (2007) concluded that several factors contributed towards teachers' learning about assessment including: (a) inquiry, where teachers used different sources of evidence to make decisions about teaching; (b) building social capital, where teachers

collaborated with each other; and (c) critical and responsive learning, reflection, experimenting with new ideas and using feedback. These findings suggest that viewing teachers as active learners has a positive impact on their assessment learning and may be a useful principle in designing future professional learning activities.

Essential element 2: Ongoing, contextualised learning

According to Lieberman (1995), professional development activities have often “ignored the critical importance of the context within which teachers work” (p. 596). Job-embedded learning “is based on the assumption that the most powerful learning is that which occurs in response to challenges currently being faced by the learner and that allows for immediate application, experimentation and adaptation on the job” (Sparks & Hirsh, 1997, p. 52). Job-embedded PD links teacher learning to immediate and real-life problems faced in the classroom. Rather than being an isolated event, usually taking place outside of school, PD becomes integrated into teachers’ daily work (Speck & Knipe, 2005).

In addition to being situated in the school, a second essential element of job-embedded PD is teacher collaboration (Park et al., 2007). This model of PD calls for regular opportunities for participants to share perspectives and seek solutions to authentic problems (Hawley & Valli, 1999). Collaborative learning can take on multiple forms, from focused reading groups to in-class peer observation. Job-embedded PD acknowledges that adults learn well in groups and that teachers within the same or similar contexts can advance their inquiry further than through disconnected or individual PD (Hawley & Valli, 1999, p. 140). In this way, job-embedded PD aligns well with the first essential element of viewing the teacher as an active learner.

One instance of contextualised learning about assessment was evident in the King’s-Medway-Oxfordshire Formative Assessment Project (KMOFAP) in England, which sought to help teachers turn AfL ideas into practice (Black & Wiliam, 2006; Harrison, 2005). This project focused on practical assessment procedures to encourage teachers to engage with the pedagogical principles of AfL. Specifically, the project emphasised four main areas of AfL, including questioning, feedback, sharing criteria with

the learner and peer and self-assessment (Marshall & Drummond, 2006). A number of KMOFAP factors that align with contemporary aspects of effective professional learning contributed to teachers' adoption of AfL within their classroom. First, while the professional learning project was led by expert researchers, teacher learning occurred in the context of their own classrooms (Harrison, 2005). Based on in-class observations, direct and specific feedback was given to teachers about their use of AfL. In addition, teachers were invited to reflect on their practice through discussions with researchers and teachers from across the PD project. In this way, teachers contributed to the development of a supportive community focused on AfL. Moreover, teachers in this project were actively involved in planning their learning to scaffold toward greater AfL integration as related to context-specific problems. Based on this PD programme and on differences observed between AfL integration across school contexts, James and Pedder (2006) assert the importance of job-embedded learning and of considering teachers as active learners in PD processes. They further contend that ongoing professional learning that uses principles of AfL with teachers may present a promising way forward in promoting teacher assessment capacity.

Essential element 3: Process-based learning and reflective practice

While traditional forms of PD have focused on the transmission of a product, such as a particular teaching strategy, contemporary PD approaches emphasise process-based learning. Process-based learning maintains a much broader focus and encourages fundamental skills development applicable across areas of teaching. This form of learning connects teaching practices to teachers' pedagogical beliefs and to contemporary theory in order to provide a comprehensive approach to teacher development. In order for this to occur, we assert that teachers need space, time and guidance in both professional learning expertise and content expertise. Hence, central to this element is an emphasis on continuous and guided reflection that focuses on philosophy, theory and practice (Argyris & Schön, 1974).

Many traditional models of PD assume learning and changes in practice occur through exposure to new information (Lieberman, 1995). The

model of PD referred to as reflective practice encourages a more complex approach to PD and recognises that learning is the result of changes in deeply held beliefs (Osterman & Kottkamp, 2004). Under a reflective practice model, the learning goal is not merely the acquisition of new knowledge, but also improvements in professional practice through behavioural and belief changes. In their seminal work *Theory in Practice: Increasing Professional Effectiveness*, Argyris and Schön (1974) argued for the importance of integrating action with thought. They suggested that professional practice rests on two theories: (a) espoused theory and (b) theories-in-use. Espoused theory is developed through intentional thought and refers to what teachers believe they do in their practice (Osterman & Kottkamp, 2004). In contrast, theories-in-use are the subconscious theories that guide and influence teachers' practices (Argyris & Schön, 1974). Theories-in-use result in the spontaneous, tacit, routine responses exhibited by teachers in their daily practice. However, a teacher's espoused theories and theories-in-use may be notably different. By reflecting on their practice, teachers have the opportunity to examine the congruity of these theories and work towards greater alignment between their espoused theories and their theories-in-use. In this way, teachers develop their teaching process through reflective practice.

Recognising the importance of preservice teacher education programmes as primary sites for developing teachers' initial beliefs about assessment, DeLuca, Klinger, Searle and Shulha (2010) documented their efforts toward assessment education at a faculty of education at a Canadian university, drawing specifically on the principle of process-based learning and reflective practice. Their study described their process for developing a mandatory assessment module for teacher candidates enrolled in an 8-month preservice programme. Acknowledging the relatively short duration of this and other preservice programmes, DeLuca et al. asserted that initial teacher learning in assessment should aim to develop the skills needed for beginning teachers to engage in continued professional learning upon programme completion. Central to this approach was encouraging beginning teachers to consider "assessment as pedagogy" as a process for teaching and learning. Specifically, they state that assessment as pedagogy "implies a fully integrated understanding of assessment with other aspects of the teaching and learning process. Assessment as pedagogy

suggests that how teachers assess should be closely tied to how they teach and how students learn” (DeLuca et al., 2010, p. 36). In addition, the assessment module provided continued support for teacher candidates to reflect on their in-school teaching experiences through practice-based assignments, an assessment workshop series and an assessment resource lab. Ultimately, the programme aimed to provide teacher candidates with the skills needed for continued learning in assessment including a view toward process-based learning and critical reflection.

Developing a foundation for professional learning in assessment

In conclusion, teacher professional learning can take on a variety of forms. Although no single approach has proven best, research on adult professional learning has suggested sustained and ongoing PD connected to teachers’ daily practices that focuses on process-based learning and critical reflection. Moreover, we assert that PD approaches must enable teachers to identify and work within the systemic conditions that constrain their teaching, a challenge identified by both Bennett (2011) and Luke and McArdle (2009). As such, professional learning in assessment must take account of the specific barriers impeding AfL integration within the current context of standards-based education. Specifically, contemporary approaches to PD have the potential to enable teachers’ negotiation of the barriers and challenges of AfL integration through contextualised, sustained and supported learning. By working with teachers in the contexts and conditions that constrain their use of AfL, we believe PD development initiatives can promote greater adoption of the spirit of AfL within teaching and learning. To date, few studies have examined the pairing of contemporary professional learning models with current barriers to assessment integration. Through a literature synthesis of these fields, this analysis provides a theoretical basis for further research in AfL PD with the aim of realising the promises and goals of AfL. Specifically, we call for research that explicitly examines the ways teachers learn to integrate AfL within their current context of practice and that engages the critical question of how teachers negotiate various forms and purposes of assessment within their professional learning.

Based on our review, we suggest a collaborative approach between instructional leaders, assessment experts and teachers in co-planning PD programmes in assessment. Through such an approach, professional learning can confront the often difficult terrain of learning to implement assessment in schools in the context of competing social, political, economic and practical approaches. Further, we suggest a focus on skills development, in which teachers acquire the skills to critically reflect and think through the challenges inherent in assessment integration and their role in facilitating meaningful assessment programmes in their classrooms.

What we need as a research community is to establish and articulate frameworks for professional learning in assessment to inform assessment education programmes. In particular, a close examination of PD case studies across educational contexts will be useful in this regard. Guiding case study work should be questions such as: What educational structures and pedagogical approaches facilitate learning about assessment integration? How do collaborative and job-embedded models promote teacher learning in this area? What supports and resources are required to help teachers move toward greater assessment capacity? Finally, there is a need to explore how these emerging approaches to professional learning vary for teachers at different career stages. For example, how might assessment education change for preservice and in-service teachers or beginning teachers and more experienced teachers?

Through such a programme of research, we hope to make gains in teachers' adoption of the spirit of AfL rather than solely the procedural practices. Our own work in the context of preservice teacher education is beginning to give credence to this aim (DeLuca et al., 2010). We will continue to explore initial teacher education experiences that provide the grounding for teachers' continued professional learning throughout their careers. Most importantly, we are interested in finding ways to support the development of learning cultures involving students, teachers and administrators that value assessment as a central component of the teaching and learning process.

References

- Adams, J. E., & Kirst, M. W. (1999). New demands and concepts for educational accountability: Striving for results in an era of excellence. In J. Murphy & K. S. Louis (Eds.), *Handbook of research on education administration* (2nd ed., pp. 463–489). San Francisco: Jossey-Bass.
- Allen, D. W., & LeBlanc, A. C. (2005). *Collaborative peer coaching that improves instruction: The 2 + 2 performance appraisal model*. Thousand Oaks, CA: Corwin Press.
- Argyris, C., & Schön, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco: Jossey-Bass.
- Assessment Reform Group. (2002). *Assessment for learning: 10 principles*. Cambridge: Author.
- Atherton, J. S. (2009). *Learning and teaching: Reflection and reflective practice*. Retrieved 10 April 2010, from <http://www.learningandteaching.info/learning/reflecti.htm>
- Ball, S. (2004). Performativities and fabrications in the education economy: Towards the performative society. In S. J. Ball (Ed.), *The RoutledgeFalmer reader in the sociology of education* (pp. 143–155). London: RoutledgeFalmer.
- Baron, D. (2008). Imagine: Professional development that changes practice. *Principal Leadership: High School Edition*, 8, 56–58.
- Bennett, R. E. (2011). Formative assessment: A critical review. *Assessment in Education: Principles, Policy & Practice*, 18(1), 5–25.
- Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003). *Assessment for learning: Putting it into practice*. Berkshire, UK: Open University Press.
- Black, P., & Wiliam, D. (1998). *Inside the black box*. London: King's College.
- Black, P., & Wiliam, D. (2006). Developing a theory of formative assessment. In J. Gardner (Ed.), *Assessment and learning* (pp. 81–100). London: Sage.
- Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, 21(1), 5–31.
- Brown, G. T. L., Kennedy, K. J., Fok, P. K., Chan, J. K. S., & Yu, W. M. (2009). Assessment for student improvement: Understanding Hong Kong teachers' conceptions and practices of assessment. *Assessment in Education: Principles, Policy & Practice*, 16, 347–363.
- Carless, D. (2005). Prospects for the implementation of assessment for learning. *Assessment in Education*, 12(1), 39–54.
- Cochran-Smith, M. (2006). Foreword. In L. R. Van Zoest (Ed.), *Teachers engaged in research: Inquiry into mathematics classrooms, grades 9–12* (p. ix). Greenwich, CT: Information Age.
- Costa, A. L., & Garmston, R. J. (1994). *Cognitive coaching: A foundation for renaissance schools*. Norwood, MA: Christopher-Gordon.

- Darling-Hammond, L., & McCloskey, L. (2008). Assessment for learning around the world: What would it mean to be internationally competitive? *Phi Delta Kappan*, 90, 263–272.
- Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Stanford, CA: National Staff Development Council and the School Redesign Network at Stanford University.
- DeLuca, C., Klinger, D., Searle, M., & Shulha, L. M. (2010). Developing a curriculum for assessment education. *Assessment Matters*, 2, 20–42.
- Duncan, C. R., & Noonan, B. (2007). Factors affecting teachers' grading and assessment practices. *Alberta Journal of Educational Research*, 53, 1–21.
- Feeney-Jonson, K. (2008). *Being an effective mentor: How to help beginning teachers succeed* (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Fullan, M. G. (1993). *Change forces: Probing the depths of educational reform*. Levittown, PA: Falmer Press.
- Gardner, J. (2006). Assessment for learning: A compelling conceptualization. In J. Gardner (Ed.), *Assessment and learning* (pp. 197–204). London: Sage.
- Garet, M. S., Porter, A., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38, 915–945.
- Gipps, C. (1999). Socio-cultural aspects of assessment. *Review of Research in Education*, 24, 355–392.
- Hargreaves, A. (2007). Five flaws of staff development and the future beyond. *Journal of Staff Development*, 28, 37–38.
- Hargreaves, A., Earl, L., & Schmidt, M. (2002). Perspectives on alternative assessment reform. *American Educational Research Journal*, 39(1), 69–95.
- Hargreaves, E. (2005). Assessment for learning? Thinking outside the (black) box. *Cambridge Journal of Education*, 35, 213–224.
- Harrison, C. (2005). Teachers developing assessment for learning: Mapping teacher change. *Teacher Development*, 9, 255–263.
- Hawley, W. D., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127–150). San Francisco: Jossey-Bass.
- Hume, A., & Coll, R. K. (2009). Assessment of learning, for learning, and as learning: New Zealand case studies. *Assessment in Education: Principles, Policy & Practice*, 16(3), 269–290.
- James, M., & Pedder, D. (2006). Professional learning as a condition for assessment for learning. In J. Gardner (Ed.), *Assessment and learning* (pp. 27–44). London: Sage.

- Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
- Klinger, D., DeLuca, C., & Miller, T. (2008). The evolving culture of large-scale assessments in Canadian education. *Canadian Journal of Educational Administration and Policy*, 76, 1–34.
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. New York: Cambridge.
- Knowles, M. S. (1984). *Andragogy in action: Applying modern principles of adult learning*. San Francisco: Jossey-Bass.
- Lee, C., & Wiliam, D. (2005). Studying changes in the practice of two teachers developing assessment for learning. *Teacher Development*, 9, 265–283.
- Levin, B. (1998). An epidemic of education policy: (What) can we learn from each other? *Comparative Education*, 34(4), 131–141.
- Lieberman, A. (1995). Practices that support teacher development. *Phi Delta Kappan*, 76, 591–596.
- Lingard, B., Mills, M., & Hayes, D. (2006). Enabling and aligning assessment for learning: Some research and policy lessons from Queensland. *International Studies in Sociology of Education*, 16(2), 83–103.
- Little, J. W. (1999). Organizing schools for teacher learning. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 233–262). San Francisco: Jossey-Bass.
- Luke, A., & McArdle, F. (2009). A model for research-based State professional development policy. *Asia-Pacific Journal of Teacher Education*, 37(3), 231–251.
- Mabry, L., Poole, J., Redmond, L., & Schultz, A. (2003). Local impact of state testing in southwest Washington. *Education Policy Analysis Archives*, 11(22). Retrieved 10 April 2010, from <http://epaa.asu.edu/epaa/v11n22/>
- MacBeath, J., Pedder, D., & Swaffield, S. (2007). Schools learning how to learn. In M. James, R. McCormick, P. Black, P. Carmichael, M. Drummond, A. Fox, J. MacBeath, B. Marshall, D. Pedder, R. Procter, S. Swaffield, J. Swann, & D. Wiliam (Eds.), *Improving learning how to learn: Classrooms, schools and networks* (pp. 64–88). Abingdon, UK: Routledge.
- MacLellan, E. (2001). Assessment for learning: The differing perceptions of tutors and students. *Assessment & Evaluation in Higher Education*, 26, 307–318. doi: 10.1080/02602930120063466
- MacPhail, A., & Halbert, J. (2010). ‘We had to do intelligent thinking during recent PE’: Students’ and teachers’ experiences of assessment for learning in post-primary physical education. *Assessment in Education: Principles, Policy and Practice*, 17(1), 23–39.
- Madaus, G. F., & Kellaghan, T. (1992). Curriculum evaluation and assessment. In P. W. Jackson (Ed.), *Handbook of research on curriculum* (pp. 119–154). New York: Maxwell Macmillan International.

- Marczely, B. (1996). *Personalizing professional growth: Staff development that works*. Thousand Oaks, CA: Corwin Press.
- Marshall, B., & Drummond, M. J. (2006). How teachers engage with assessment for learning: Lessons from the classroom. *Research Papers in Education*, 21(2), 113–149. doi: 10.1080/02671520600615638
- Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I. Outcome and process. *British Journal of Educational Psychology*, 46, 115–127.
- McLaughlin, M. W., & Talbert, J. E. (2006). *Building school-based teacher learning communities: Professional strategies to improve student achievement*. New York: Teachers College Press.
- McMillan, J. H., Hellsten, L., & Klinger, D. (2010). *Classroom assessment: Principles and practices for effective standards-based instruction*. New York: Allyn & Bacon.
- Morgan, C., & Watson, A. (2002). The interpretive nature of teachers' assessment of students' mathematics: Issues for equity. *Journal for Research in Mathematics Education*, 33(2), 78–90.
- Osterman, K. F., & Kottkamp, R. B. (2004). *Reflective practice for educators* (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Park, S., Oliver, J. S., Johnson, T. S., Graham, P., & Oponng, N. K. (2007). Colleagues' role in the professional development of teachers: Results from a research study of National Board certification. *Teaching and Teacher Education*, 23, 368–389.
- Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective?: Strategies that foster curriculum implementation. *American Educational Research Journal*, 44, 921–958.
- Perrenoud, P. (1998). From formative evaluation to a controlled regulation of learning processes: Towards a wider conceptual field. *Assessment in Education: Principles, Policy & Practice*, 5(1), 85–102.
- Popham, W. J. (2008). Classroom assessment: Staying instructionally afloat in an ocean of accountability. In C. A. Dwyer (Ed.), *The future of assessment: Shaping teaching and learning* (pp. 263–278). New York: Lawrence Erlbaum.
- Schön, D. A. (1983). *The reflective practitioner*. New York: Basic Books.
- Schön, D. A. (1987). *Educating the reflective practitioner: Towards a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.
- Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researchers*, 29(7), 4–14.
- Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, 78(1), 153–189.
- Sparks, D., & Hirsh, S. (1997). *A new vision for staff development*. Oxford, OH: National Staff Development Council.
- Speck, M., & Knipe, C. (2005). *Why can't we get it right?: Designing high-quality professional development for standards-based schools* (2nd ed.). Thousand Oaks, CA: Corwin Press.

- Taras, M. (2007). Assessment for learning: Understanding theory to improve practice. *Journal of Further and Higher Education, 31*, 363–371.
- Torrance, H., & Pryor, J. (2001). Developing formative assessment in the classroom: Using action research to explore and modify theory. *British Educational Research Journal, 27*, 615–631.
- Willis, J. (2010). Assessment for learning as a participative pedagogy. *Assessment Matters, 2*, 65–84.
- Wylie, E. C., & Lyon, C. J. (2009, April). *How much is enough: What is needed for a district to take on the formative assessment challenge?* Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.
- Yorke, M. (2003). Formative assessment in higher education: Moves towards theory and the enhancement of pedagogic practice. *Higher Education, 45*, 477–501.

The authors

Dr Christopher DeLuca is an assistant professor at Queen's University in Kingston, Canada. His primary area of research focuses on assessment education for preservice and in-service teachers. He is especially interested in the use of assessment to support and promote student learning.

Email: cdeluca@queensu.ca

King Luu is completing his PhD at Queen's University in Kingston, Canada. His research focuses on large-scale assessment and computer-based testing.

Email: king.luu@queensu.ca

Youyi Sun is completing his PhD at Queen's University in Kingston, Canada. His research examines the validity of large-scale language testing with an emphasis on consequential aspects of test use.

Email: youyi.sun@queensu.ca

Dr Don Klinger is a professor at Queen's University in Kingston, Canada. His primary research centres on the methods used to measure educational outcomes and the resulting decisions based on assessment results. He is particularly interested in classroom and large-scale assessment from a practical and policy perspective.

Email: don.klinger@queensu.ca