

## Cultural Perspectives on Classroom Assessment: A Path Toward the “Japanese Assessment for Learning Network”

Masahiro ARIMOTO

(Professor, Graduate School of Education, Tohoku University)

Ian CLARK

(Professor, Nagoya University of Commerce and Business)

Saye YAMAMOTO

(Graduate Student, Graduate School of Education, Tohoku University)

Masamitsu SHINKAWA

(Graduate Student, Graduate School of Education, Tohoku University)

### Abstract

There is no doubt that education in the 21<sup>st</sup>-century is a dynamic and stimulating area. Students and teachers are now engaging in dialogues of unprecedented complexity in response to changing times, needs, and social groupings, and no nation is exempt from this process. The 21<sup>st</sup> century global economy is knowledge-based, as it is driven by information and skills that contribute to an accelerated pace of technical and scientific advancements, as well as rapid obsolescence. Educational practice itself is therefore in a state of great transition as many nations are modifying their teaching and learning activities in an effort to promote performance. One such measure, termed formative assessment, is a classroom assessment practice that is becoming the heart of the educational framework. This practice promotes continuous learning and assessment dialogue between students and their teachers, along with their peers in a learning community. article explores how classroom assessments are embedded into the instructional process around the world and details Japanese perspectives on classroom learning and assessment in an international context. In doing so, the impact of the development of the Japanese Assessment for Learning Network (JAfLN) is discussed. The JAfLN would become a non-profit organization that connects Japanese people who are interested in the use of assessment for learning and the development of related policies and research in education.

In preparation for writing this article, the first author, Masahiro Arimoto, participated in the International Symposium on Classroom Assessment and Assessment for Learning (AfL) held on April 8–12, 2014, in Fredericton, New Brunswick in Canada. This international symposium

inspired the writing of this article as a development of the existing literature, and in an effort to explore perspectives on classroom teaching and learning in Japan as well as in other nations (Arimoto, 1995; Arimoto & Ishimori, 2013). Characterized as a powerful series of conversations and dialogues, the symposium was an open forum where academics and practitioners gathered to share their work, ideas, projects, and best practices on formative classroom assessment described by Brookhart (2007) as a process that “gives teachers information for instructional decisions and gives pupils information for improvement” (p. 43).

Discussion took place under three broad umbrellas—policy, professional learning, and research. The participants were teams of experts from six areas across the globe: Canada, the United States, the United Kingdom, New Zealand, Australia, and continental Europe. This year independent delegates were invited from Singapore. One of the conclusions drawn was that assessment is a matter of culture, as indicated by the following remark: “I would have liked to learn more about Japanese cultural aspects that, as I sense, could be conducive for successful implementation of AfL”. Another noteworthy comment about the relationship between culture and formative assessment is as follows: “I think you are right that certain aspects of Japanese culture, such as a belief in *kaizen* would be especially supportive of the development of formative assessments. Indeed, many aspects of formative assessment are already incorporated into Japanese lesson study, although they are often not well developed”. *Kaizen* refers to the Japanese concept of continuous improvement through profound introspection, and it is one of many values deeply rooted in Japanese culture—and therefore affects teaching and learning in Japan.

In July of 2008, experts from the Organisation of Economic Co-operation and Development (OECD) met to discuss key competencies of formative assessment. According to Janet Looney, now Director of the European Institute of Education and Social Policy (EIESP), the seminar was the first of its kind to be held in Asia. Issues relating to the implementation of formative assessment were further developed at the OECD’s 2012 seminar in Japan. It was there that Canadian researcher and former advisor to the Canadian prime minister on educational matters, Michael Fullan, advised Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT) “not to rely on increasing accountability by relying on check and improve cycles unless they are embedded in the day-to-day work.” At a follow-up seminar held by the OECD in Sendai, Japan, Andreas Schleicher, the Director for Education and Skills and Special Advisor on Education Policy to the Secretary-General of the OECD, highlighted the importance of 21<sup>st</sup> century learning skills required for the acquisition of lifelong learning competencies.

This article emphasizes cultural context and examines the theory and practice of classroom assessments designed to support the acquisition of lifelong learning skills in Japanese and

Western cultures. Understanding the importance of culture in Japanese schools requires the reader to understand that Japan is a process-oriented society. As a nation, Japan is a reflective society, self-aware but within the means of their cultural identity, as “they are alert to the end to maintain their own cultural values and practices at the core of any new system adopted. They regard culture as an integral, dynamic part of their society and economy” (Fereshteh, 1992, p. 23).

### **Cultural Perspectives on Classroom Assessment**

Many of the instructional practices that have advanced as intrinsically motivating and, therefore, facilitate higher-order thinking and learning are inherent in socio-constructivist learning environments (Walker, 2010). One such practice is known as formative assessment, which is an assessment process that serves teachers and students so that sound instructional decisions are made and next steps for effective learning may be planned and implemented collectively. It also provides scaffolded assistance in taking the next steps toward improving students' work. The notion of scaffolding, first presented in the foundational socio-constructivist work of Wood, Bruner, and Ross (1976) is an assisted type of learning “best understood as involving mutual adjustment and appropriation of ideas” (Goos, Galbraith, & Renshaw, 2002, p. 195). The practice of scaffolding supports a socially interactive and cognitively flexible approach to thinking, learning, and problem-solving that resides at the center of 21<sup>st</sup> century education (Black & William, 2006; Clark, 2012). It is, therefore, important to understand how school staff interacts with learners and parents, in order to gather and use evidence of learning to deliver consistent and effective classroom assessments that support lifelong learning capacities (Clark, 2012; 2014). In Japan, the Central Council for Education (1996) also emphasizes the role of parents, stressing that if “competences for positive living” are to be cultivated, it is important for schools, parents, and the community to work together as partners (as cited in Shinkawa & Arimoto, 2012, p. 62).

In their book *Preparing Teachers for a Changing World*, American researchers Bransford, Derry, Berliner, Hammerness, and Beckett (2005) explain the qualities of effective classroom assessors, with the goal of teachers becoming adaptive experts. Adaptive experts access written information sources, solve problems collaboratively, experiment with their environments, and create new ideas to see if improvements in their own professional practice further learning. For students to become effective learners, they need to observe and interact with school staff who compose relationships characterized by flexible and innovative applications of knowledge (Eisner, 2005). Working alongside adults in this type of learning environment prepares students to be confident learners who are capable of making good decisions inside, outside, and beyond school (Black & William, 2009; Bransford et al., 2005; Scottish Government, 2011; Vogt & Rogalla, 2009). The connection between curricula that drives formative assessment practices and the acquisition

of lifelong learning capacities has been established by the OECD (OECD, 2005; the Japanese translation of this book was supervised by the lead author of this paper in 2008) among others (e.g., Black & William, 2009; Clark, 2012; Stiggins, 2007). In the formative assessment classroom, students are building their understanding of new concepts, not only with their teachers but with each other, in order to assess the quality of their own and their peers' work against well-defined criteria. When students are actively engaged in such activities, they are developing invaluable skills for lifelong learning (OECD, 2005). The purpose of this interactive assessment is to create visible evidence of learning and provide immediate yet reliable feedback to school staff, learners, and parents about the standards that have been achieved and the next steps for improvement. The methods employed to reveal student understanding, making it visible as assessment evidence, reside in the theories of learning collectively known as the sociocultural theory arising from the foundational work of Russian developmental psychologist L. S. Vygotsky (1896–1934). However, in Japan, the prescriptive rules of social interaction render the development of spontaneous and creative neo-Vygotskian programs, based on mutuality and informality, culturally undesirable (Mantero & Iwai 2005; Wray 1999).

### **Sociocultural Basis for Effective Classroom Learning**

Culture and cultural practices are considered, from a sociocultural or socio-constructivist perspective, to play a critical role in shaping classroom practices. Cultural practices are valued highly in Japan and are associated with a sense of community cohesion. Cohesion is particularly important in a post-modern Japanese society characterized by dramatic change and uncertainty. Shinkawa and Arimoto (2012), in their reflection on the great earthquake and tsunami (*Higashi-nihon-daishinsai*) in 2011, refer to the Central Council for Education's statement in 1996 that Japan faced "a difficult period of rapid change, in which the way ahead would be difficult to discern" (p. 62). The lead author of this paper works closely with the OECD on projects designed to restore the community and prepare for the challenges ahead (OECD-Tohoku 2.0 project), a task viewed positively, as it is an opportunity to improve area schooling. Hence, cultural practices are particularly important in the aftermath of crises like the Fukushima earthquake, tsunamis, and nuclear accidents. Indeed, in contrast to the very serious violence and looting witnessed after Hurricane Katrina struck New Orleans in 2005, the Japanese demonstrated a deep sense of social solidarity, which is the envy of other cultures (see comments by Lewis in the concluding section). As Shinkawa and Arimoto (2012) observe, the Japanese "display altruism even in adversity" (p. 67). The reason "is rooted in thousands of years of Japanese tradition and luckily has withstood outside influences" (p. 67). After the 2011 cataclysm at Fukushima, Shinkawa and Arimoto (2012) surveyed secondary students using the Education for Sustainable Development (ESD) competency

questionnaire. It was found that the influence of traditional culture reinforced the resilience of current Japanese secondary students by supporting “cooperative working” or “stress-managing” competencies (p. 67).

In general, being a part of a cultural community that is associated with belonging and identity determines the kinds of discourses found in that particular community (Pryor & Crossouard, 2008). Across cultures, belonging, trust, and respect are not regarded as peripheral aspects of learning. They relate to the innate psychological needs of the learner and the essential sociocultural foundation for classroom interactions that teachers need to maintain so that students engage in the risky process of negotiating more appropriate and confident learning identities (Willis, 2010). Putney and Broughton (2011) view the teacher as a community organizer, responsible for developing collective classroom efficacy by structuring active participation in appropriate social learning experiences. In the role of community organizer, the teacher is concerned with “developing self-improvement capabilities, constructing a self-directing collective, while continuing to promote unity and motivate interdependence” (Putney & Broughton, p. 101).

In the formative classroom, knowledge is created collectively, producing a learning culture through the social construction and sharing of culturally-specific meanings. When learners are participating in a collective cultural setting, they are learning all the time about how to be a more effective member of that particular society. For Western socio-constructivists, feedback, dialogue, and peer assessment are viewed as an opportunity for students to learn the cultural expectations about being an autonomous learner or central participant within the classroom society: “This process of becoming more expert and belonging within the community of practice involved students negotiating identities of participation that included knowing both academic skills and social expectations within the classroom” (Willis, 2010, p. 1).

### **Interaction, Dialogue, and the Regulation of Learning**

The issue of formative assessment became prominent in 1998 when British researchers Paul Black and Dylan William from King’s College, London, published their seminal article presenting evidence on the beneficial effects of an “interactive style” of teaching. Although the scientific reliability of their evidence has been contested by American statisticians (Dunn & Mulvenon, 2009; Bennett, 2011; for a full discussion, see Clark, 2011). Nevertheless, by 2002, formative classroom interactions had become a key OECD theme, and quickly took on a global momentum. Black and William (2009) then developed the theoretical basis supporting “formative interaction” (p. 2) by integrating ideas from both cognitive (cf. Bandura, 1997) and social theories (cf. Wenger, 1998) of learning. It was in this article that they introduced the notion of the “moment of contingency” (p. 10). These moments are opportunities to further learning through spontaneous

real-time adjustments in learning discourse. These moments arise continuously as opportunities for teachers to probe into students' responses and reply appropriately, in a way that regulates learning. Additionally, these moments also arise when teachers circulate around the classroom, looking at individuals' work, observing the extent to which they are on track—a strategy often used in Japanese classrooms. In most Japanese mathematics classrooms, the regulation of learning is relatively tight, so the teacher attempts to “bring into line” all learners who are not heading toward the particular goal sought; as in these courses, the goal of learning is generally both highly specific and common to all of the students in a class. In contrast, when the class is doing an analysis or exploratory work, the regulation is much looser. Rather than a single goal, there is likely to be a broad horizon of appropriate goals (Marshall, 2004), all of which are accessible, and the teacher will intervene to bring the learners into line only when the trajectory of the learner is radically different from the goal of the lesson. In this context, it is worth noting that there are significant cultural differences in how to use this information. In the United States, the teacher will typically intervene with individual students when they appear not to be on track, whereas in Japan, the teacher is far more likely to observe all the students carefully, while walking around the class, and then will select some major issues for discussion with the whole class.

Wolfe and Alexander (2008) summarized a significant body of longitudinal research indicating that exploratory talk, argumentation, and dialogue “promote high-level thinking and intellectual development through their capacity to involve teachers *and* [emphasis added] learners in joint acts of meaning-making and knowledge construction” (p. 1). In a New Zealand study, Willis (2010) observed the negotiation of meaning between teacher and students, and among peers. Willis quoted the work of Wenger (1998) who described this type of dialogue as possessing “a flavour of continuous interaction, of gradual achievement and of give and take” (p. 53). The ongoing dialogue within the class, the powerful learning between peers, and the way the teacher shared the ownership of the tools gave freedom of movement within the class and invited students to develop identities as agentive (i.e. self-regulatory) participants (Willis, 2010). In Western contexts, a formative interaction is therefore one that emphasizes agency (individual leadership in collective settings). A formative interaction is also one in which an interactive situation influences cognition and places cognitive demands on teachers and students to “think on their feet” or what Schön (1987) called a process of “reflection-in-action” (as cited in Pollard, 2002, p. 7).

### **Social Assistance and the Regulation of Learning**

The connection between formative classroom practices, mentioned in the preceding section of this article, and self-regulatory learning (SRL) strategies has been established by a number of

studies (see Clark, 2012 for a review). Student mastery of SRL strategies are seen to be essential in post-modern Japan. The Central Council for Education (1996) emphasizes that the children who live in 21<sup>st</sup> century Japan need to utilize the following strategies: identifying and solving problems independently; studying on their own initiative, and the willingness and ability to cooperate with others. If the strategies are to be used effectively, learners need to have developed learning identities, which support this high-level of self-regulation (as cited in Shinkawa & Arimoto, 2012, p. 62). American researchers, Zimmerman and Pons (1986), specified what these potentially formative strategies look like in the Western classroom and found they focus on self-evaluation, organization and transformation, goal-setting and planning, information-seeking, record-keeping and self-monitoring, environmental structuring, giving self-consequences, rehearsing and memorizing, seeking social assistance (from peers, teachers, or other adults), and reviewing (notes, books, or tests). Zimmerman and Pons (1986) found that the use of the strategies predicted academic success in all but a very few cases; thus, students who use the strategies routinely can be expected to reach their personal and learning goals successfully.

Stanley et al. (2009) emphasizes that the practice of assessing more complex thinking skills expected of 21<sup>st</sup> century learners has moved away from summative evaluation and toward gathering a wider sample of behaviors. It is worth noting that the word behavior is not often found in the Western vocabulary regarding formative assessment because it arises from the behaviorist perspective, as seen in the work of Skinner (1954), in which the learner merely reacts to environmental stimuli. In neo-Vygotskian contexts, the learner is seen as proactive and employs a variety of conscious personal and social strategies that regulate and transform their learning environment, so they can achieve their learning goals (Pintrich & Zusho, 2002). More specifically, learners are engaged in “an active, constructive process whereby they set goals for their learning and then attempt to monitor, regulate, and control their cognition” (p. 250). Socio-constructivists elaborate on the cognitive perspectives provided by SRL theorists (e.g. Pintrich & Zusho 2002; Zimmerman & Pons, 1986) and give analytical and theoretical primacy to the social world over the individual world (Walker, 2010). This has led to the recognition that while observations play a vital role in assessment, teachers should harness the understanding that observational data are greatly enhanced by an interactive style of teaching and learning.

Studies related to classroom interaction in Europe (e.g. Allal, 2011) indicate that when students actively participate in a dialogue with the teacher and with their peers about the subject matter, it is possible to identify processes of co-regulation conducive to good learning. For example, in Switzerland, 5<sup>th</sup> grade elementary school students were engaged in whole-class discussion on the learning goals of a writing task. This, as seen in the work of Purdie and colleagues (1996) in Australia, stands as something of a contrast to the strategies used by

Japanese students, who seek social assistance less actively than their Western counterparts. From a European perspective, discussing student understanding of the learning goals and criteria is the essential ingredient for any formative assessment activity (Black & William, 2009). As a result, Allal (2011) found that the final products reflected the collective understanding of the goals of the work and also the students' individual, self-regulated interpretation of the goals. This means that the outcome is in part determined by students' dialogic contributions to the goal-setting and learning process. A Norwegian study (Gamlem & Smith, 2013) found that the dialogic feedback practice, while rarely used, was perceived as useful by students because "it generates learning, provides information about achievement, gives targeted individual information to proceed and develop understanding, and is used as an interactive dialogue between the teacher and the student(s) or among the students" (p. 164). Japanese teachers favor whole-class interaction, in order to draw out implications for the learning of the whole class, rather than for each individual student. Evidence does indicate that Japanese methods are highly effective. For example, Bromme and Steinbring (1994) discovered in their expert-novice analysis of two mathematics teachers that the novice teacher tended to treat students' questions as being from individual learners, whereas the expert teacher's responses tended to be directed more to a "collective student". This teaching strategy also finds support in the influential theoretical work of British formative assessment researchers Black & William (2009).

### **Social and Peer Interaction**

Although rarely practiced, the research on formative assessment indicates that peer-assessment and the moderation of each other's work enhances student learning. In Willis' (2010) New Zealand case study, she explored classrooms where students were expected to work with their peers, either in "highly structured ways," "informally structured groups," or in "fluid and unstructured" ways. It was found that students expressed a strong preference for learning from peers: "It just helps to talk to them because sometimes they understand or you understand so you can discuss and see what you have learned" (Student, Year 8, 12 years old), and "Other students like know how we learn cos we are with them every day. So I guess we get feedback about how they do it and how we do it and how we can improve and stuff" (Student, Year 8, 12 years old).

The preference for peer learning was also found by Hallam, Kirton, Pfeffers, Robertson, and Stobart (2004) in their report on the wide-spread implementation of formative assessment practices across Scotland. In England, Harrison (2009) suggests that students should be trained in social and relational skills required for effective peer-assessment to take place. In England and Wales, teachers often train their students to assess the work of others by giving them anonymous

work so that students' confidence and self-esteem is not impacted negatively. It was found (Harrison, 2009) that many students find it easier to assess the work of others as it releases them from the subjective bias associated with assessing their own work.

The efficacy of peer-interaction to support "good learning" has been confirmed in the last three or four years by neuroscientific studies on social interaction. Evidence has emerged to indicate that collaborative peer-interaction recruits the mesolimbic dopamine reward system in the human brain, providing a feeling of intrinsic fulfillment to the learners engaged in the interaction (e.g. Krill & Platek, 2012). Learners experience positive feelings in anticipation of mutual interaction (Salamone & Correa, 2013), and of course, during an interaction, learners feel motivated to create and capitalize on opportunities to collaborate together in order to solve a particular problem (Redcay et al., 2010). This scientific evidence supports the findings of Purdie, Hattie, and Douglas (1996) in Australia, and of Zimmerman and Pons (1986) in the United States, as they found that high achievers are more socially interactive and enjoy using their peers and teachers as social sources of assistance. In reality, peer-assessment is rarely practiced in any cultural context. For example, in the United Kingdom, Tiknaz and Sutton (2006) found that peer-assessments were conducted only once or twice a year. Similarly, Arimoto and Goda (2013), in their study of Japanese high schools, found that peer-assessments were used the least often of any formative assessment strategy. Nevertheless, it was found that Japanese students employed a range of strategies for success, and that across cultures those students who used self-regulatory strategies (see Pintrich & Zusho, 2002) attained high test results (Purdie & Hattie, 1996; Purdie, Hattie & Douglas, 1996; Zimmerman & Pons, 1986).

### **Socio-Constructivist Perspectives on Interaction and Learning**

The discussion on culture and identity in the previous section entails a more detailed exploration of culture and learning in classrooms. In the Western context, effective formative practice is founded upon socio-constructivist theories arising from the work of Wood et al. (1976) and Vygotsky (1978). Socio-constructivist theories give analytical and theoretical primacy to active social participation over the passive reception of the individual (Walker, 2010). This perspective has been endorsed by recent findings by social neuroscientists. For example, German neuroscientist, Schilbach (2014), found the "ontogenetic primacy of social interaction over observation" (p. 1). The complex bi-directionality between individual learners and the social environment may be described as a dynamic interdependence between the social and individual worlds. Concepts, such as Vygotsky's zone of proximal development (ZPD), explain how aspects of the social world are selectively internalized and then externalized as social interaction. This concept is particularly important in Japanese culture, where the externalization of social

interaction is often based on formal convention and conformity, and so the social interactions found in Japanese classrooms will differ from those observed in Western contexts (Clark, 2008).

In their European study, Allal and Pelgrims Ducrey (2000) observed that interactive formative assessment is intended to provide scaffolding in the ZPD, the place where Vygotsky (1978) hypothesized that learning takes place. In general, formative assessment is characterized as a discursive social practice involving the social construction of meaning between teacher and students and (theoretically) among peers (Pryor & Crossouard, 2008). This brings into play issues of social power and collaboration between people engaged in a learning interaction. When they take on collaborative roles in an interaction, as should be found in the formative classroom, they are assisting each other mutually and equally while attempting to solve a particular challenge or problem. Goos, Galbraith, and Renshaw (2002) applied the term “collaborative zone of proximal development” to their research regarding mathematics education. To Goos, Galbraith, and Renshaw (2002), the internalization of knowledge is a process of scaffolding learning toward the next (or most proximal) step in an individual’s learning progression. A collaborative ZPD therefore “involves *mutual* adjustment and appropriation of ideas” between interactants (p. 195). From a Western perspective, every occasion of joint activity provides a potential opportunity for the development of all participants (Rogoff, 2003). As previously noted (Mantero & Iwai, 2005), the extent to which this will occur in Japan remains to be seen, as these schools discourage spontaneity and creativity, as language and social customs often emphasize distance.

There has been some movement toward what may be seen as Western perspectives. Although, it should be noted carefully that the blending and consequent fusion of new ideas has created a unique Japanese system, from which Western nations might learn. Japanese schools have a long history of undifferentiated group instruction and rote learning. By the mid-1980s, it was becoming clear that reform was required, and by the 1990s there were moves to promote active participation and the production of knowledge among students, particularly at elementary and middle school levels (Central Council for Education, 1996). An emphasis was also placed on schools becoming integral players in the wider community—this became a priority of particular importance to the Tohoku region in the wake of the 2011 Fukushima disasters. However, the creation of open and spontaneously dialogic classrooms, as expressed by such Western educational theorists such as Wenger (1998), faces cultural obstacles in Japanese schools (Clark, 2008). Verbosity is frowned upon, and proverbs like “silence is golden” and “still waters run deep” are used favorably. According to Lebra (1976) “implicit, nonverbal, intuitive communication” is valued above an “explicit, verbal exchange of information” (as cited in Masahiko & McCabe, 1991, p. 46). As the Australian work of Purdie, Hattie, and Douglas (1996) indicates, Japanese students seek social assistance less actively than their Western counterparts. This could also be due to the

Japanese ethic of personal effort (Holloway, 1988). As the Vygotskian ZPD is founded upon the creativity and spontaneity found in dialogue during periods of assisted learning, a clear cultural schism can be seen separating Western strategies from Japanese strategies in the regulation of learning. Yet, it is probable that Japanese learners do not think differently than their Western peers to any significant degree, but their thoughts are transformed into overt and verbal action differently due to the influence of Japanese cultural context over social interaction. As Takanashi (2004) notes, “Japanese society tends to value formality in public contexts. This is true of schools in Japan. Hence, formality is more important than creativity” (p. 9).

**Feedback loops.** As social learning theorists (e.g. Wenger, 1998; Hattie, 1999; Hattie & Timperley, 2007) note, a form of dialogue of particular importance is continuous feedback on student thinking and learning. Therefore, building in time for responses is a central feature of the elementary and middle school system in Japan. For example, in middle school science, a teaching unit is typically allocated 14 lessons, but the content usually occupies only 10 or 11 lessons, allowing time for short tests to be given in the 12<sup>th</sup> lesson, and for the teacher to reteach aspects of the unit that were not well understood in lessons 13 and 14 (William & Leahy, 2007, p. 37). The shortest feedback loops are those involved in the day-to-day classroom practices of teachers, where teachers adjust their teaching in light of pupils’ responses to questions or other prompts in real time. The key point is that the length of the feedback loops should be tailored according to the ability of the system to react to the feedback. However, this does not mean that the responsiveness of the system cannot be changed. Through appropriate proactive regulation, responsiveness can be enhanced considerably. When teachers have collaborated to anticipate the responses that pupils might make to a question and which misconceptions would lead to particular incorrect responses—for example, through the process of Lesson Study (LS) practiced in Japan (Lewis, 2002)—teachers have been able to adapt their instruction much more quickly. They might even have alternative instructional lessons ready. In this way, feedback for the teacher that in the normal course of things might need at least a day to modify instruction, could affect instruction immediately (William & Leahy, 2007). Black and William (2009) term this formative feedback strategy as “synchronous” (i.e. immediate) feedback; therefore such practices are entirely consistent with effective formative assessment. Indeed, William (2011) noted the similarity between the pattern of teaching in Japanese middle school mathematics classrooms (i.e. *kaizen*), and mastery learning strategies used by practitioners of formative assessment.

## Professional Development and Lesson Study

The rigorous moderation of classroom assessment practices is not possible without the full commitment of staff when faced with the inevitable challenges associated with transforming

classroom practice into dialogic and interactive styles of teaching. In a recent report, Hayward and Spencer (2010) identified positive types of staff development activities that fostered such commitment: “A combination of external expertise and school-based developments by teachers; peer support, rather than leadership by supervisors; encouragement and extension of professional dialogue; and processes to sustain the professional development over time and allow teachers to embed new practice in classroom work. A crucial finding was that no single element worked on its own” (p. 174).

In an earlier Scottish study, Hallam et al. (2004) addressed the reasons why the development and implementation of formative assessments in Scotland had succeeded, whereas previous attempts at reform had failed. The report identified four major features that contributed to the project’s success: peer collaboration among teachers, researchers, and policy-makers; support to encourage informed risk-taking from the head teacher and senior management team; a developmental approach to the process; and a less hierarchical approach that focused on learning “where people enjoyed what they were doing and found pleasure in the children developing and learning” (p. 134). A further key aspect of professionalism for teachers was the sense of being listened to. The decision by Scottish program managers was to engage teachers as partners in constructing innovative projects and in determining their own strategies for how to use and conduct instruction and assessment in their classrooms, which enhanced their commitment to the formative assessment process. This participative role gave teachers the feeling that their professionalism was respected and crucial to the program (Hayward & Spencer, 2010). This sense of professionalism and commitment further ensured that the classroom practices remain consistent with curricula standards.

Harrison (2009) reports on efforts in England and Wales to support the consistent and frequent use of formative practices by incorporating the Japanese concept of LS by conducting “lesson observations” and other methods such as, “scrutinizing staff feedback in student exercise books, and discussions” (p. 10). This, remarks Harrison, made it “possible to identify individuals who are already incorporating many of the basic ideas of good practice in their teaching” (p. 10). However, the use of LS is not embedded as a regular practice in schools in the United Kingdom as it is in Japan, and in general it needs to be developed as a research tool used in explicit situations and advanced into a regular action-research process. Stigler and Hiebert (1999) describe LS (*jugyuu kenkyuu*) in the Japanese context as a process of first defining the problem, followed by a succession of processes: planning the lesson; teaching the lesson; evaluating the lesson and reflecting on its effect; revising the lesson; teaching the revised lesson; evaluating and reflecting again; and sharing the results.

MEXT revealed that 99.5% of elementary schools and 98% of middle schools conduct LS

once a year, but only 21% and 9% implement LS 15 or more times. The survey could not find a statistical relationship between the frequency of LS and the academic performance of the schools. Nevertheless, many researchers and educators attest to the effectiveness of LS because it facilitates professional learning communities (PLCs) and forges closer connections with their students. PLCs are very similar to the communities of practice mentioned earlier as they provide an intra-school and inter-school forum across which the moderation of classroom practices may occur. In 2008, the Akita Educational Centre surveyed teachers ( $n = 300$ ) in Akita Prefecture. They asked the question “What do you think is important for enriching your LS experience?” In clear reference to the centrality of school PLCs, the most frequently stated opinion was “Discussion (*kyougikai*) among teachers of the grade or the subject after observing lessons by each other” (84.7%) followed by “Evaluation from peer teachers” (81.7%). The PLC is a forum where teachers discuss and communicate with other teachers (communicating about how they communicate); discussions center around the collective creativity of teachers and how to improve the quality of instruction. Chichibu and Kihara (2013) noted that very few high schools invite them to their schools for observation purposes. They continued, “when we observe research lessons in high schools, we tend to see a tedious lesson that relies heavily on the traditional lecture format...thus failing to encourage students’ higher order thinking” (p. 23). They also noted that the PLCs in high schools are rather dysfunctional, exhibiting only limited interaction between teachers. The situation in Japanese high schools stands in contrast to those found in Japanese elementary and middle schools where “elaborate and rigorous” (p. 23) LSs are conducted. The issues of communication, creativity, and quality are thoroughly discussed in Japanese elementary and middle schools. These are issues that also highlight key aspects of the formative assessment process and characterize the kind of expertise teachers who deliver them need to have. Such teachers are examples of Bransford and colleagues’ (2005) adaptive experts, as they are teachers who exhibit a greater tendency to enrich and refine their knowledge structures on the basis of continuing experience and learn from problem-solving episodes. Thus, it is not surprising that Bransford’s conception of teaching expertise arose from the foundational work of Japanese theorists Hatano and Inagaki (1986) who define adaptive experts as teachers who are able to (1) comprehend why the procedures they know work; (2) modify those procedures flexibly when needed; and (3) invent new procedures when none of the known procedures are effective. Therefore, if teachers are to develop an interactive style of teaching required for effective formative assessment, it would seem reasonable to suggest that they may develop adaptive expertise by incorporating the LS processes suggested by American researchers Stigler and Hiebert (1999).

Lesson studies provide a vital resource in the form of a legacy of expertise. When American

teachers retire, their lesson plans and resources retire with them (Chenoweth, 2000). Similarly, when good teachers leave to take a better position, the practices that won them their promotion also leave with them, a problem noted in literature from the United Kingdom by Harrison (2009). Lewis (2002) remarks that if formative assessment practices, or indeed any innovative practices are to be developed and continuously improved using LS, educators need to agree upon a shared goal for improvement, usually called a “research focus,” “research theme,” or “important aim,” and also collect evidence of student learning. The process of evidence collection is at the very core of the formative assessment process and also of Japanese LS.

The emphasis on student learning and development in Japan differs from that of the United States where the teachers’ strategies are the subject of greater interest than those employed by their students (Lewis, 2002). In contrast, Japanese teachers often mentioned that a major benefit of lesson studies is that it gives them “the eyes to see children” (*kodomo o miru me*) or observe lessons as they occur. The Japanese prefer live “performances” because it allows them to observe the students’ whole demeanor toward learning. For example evidence on students’ engagement, persistence, emotional reactions, quality of discussion within small groups, under-breath exclamations (*tsubuyaki*), inclusion of group members, and degree of interest in the task. This is unlike the United States, where video-taped footage is used extensively and recorded lesson feeds are seen as a supplement for live observations. Just as formative assessment places the student at the center of the process, so does the Japanese conception of LS. Again, the fact that LS can support the acquisition of the adaptive expertise that formative practitioners require seems to be a very reasonable assertion (Lewis, 2002; Yoshida, 1999).

### **Lesson Study and Collective Efficacy**

Collective efficacy is “concerned with how people work together within teams and other social units” (Lent et al., 2006, p. 74). Bandura (1997) defines collective efficacy as “a group’s shared beliefs in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment” (p. 477). Collective efficacy has important implications for teacher training and continued professional development. For example, Bandura (1993) did a collective efficacy study with staff members in 79 schools, and it was found that the stronger the collective belief in their instructional efficacy, the better the school performed academically. Goddard (1998) confirmed the potential of collective teacher efficacy, finding that it explained approximately 50% of between-school variance in mathematics and reading achievement. Contemporary educational research should afford particular consideration to Goddard, Hoy, and Woolfolk-Hoy’s (2000) reflection on Bandura’s 1993 study: “Bandura’s conclusions are powerful ones that offer great hope to schools struggling to increase student achievement and overcome

the association between socioeconomic status and achievement” (p. 497). If research of this nature was conducted in Japanese elementary and middle schools, it can be hypothesized that positive correlations between LS and improved academic performance would indeed begin to emerge.

A very significant benefit of LS and PLCs, therefore, is the creation of a collegiate atmosphere in which teachers feel comfortable and confident in relying on the expertise of others (Lewis, 2002). Japanese teachers have many opportunities to observe and discuss teaching practice with their colleagues. In contrast, only 5–13% of American teachers visit each other’s classrooms “often” or “very often” (Center for the Future of Teaching and Learning, 1998, p. 9), greatly diminishing their collective efficacy. The emphasis on this potentially very powerful collective social concept, which is at the heart of formative assessment, is based upon sociocultural perspectives, holding that school success requires interdependent efforts from individuals in collaboration.

### **Questioning Strategies and *Neriage***

Barke and Nakamura (2012) undertook a small-scale study that presents an interesting precursor for future larger-scale research that investigates the use of questioning strategies from teachers of different cultures. In this case, teachers from New Zealand and Japan were studied. Both employed closed floor (specific student selection) and open floor methods of questioning. The Japanese teacher preferred closed floor strategies in a ratio of 4:1 over open floor, whereas the New Zealand teacher’s ratio was 2:1 in favor of closed floor selection. This may indicate a preference for control; however, utterances such as “I wonder if there’s anybody who hasn’t had a turn” suggests that the Japanese teacher’s strategies would be more accurately interpreted as systematic. This then became an effective formative practice as it gave every student an opportunity to participate and equated the “no hands up” policy on questioning advocated by practitioners of formative assessment (Maher & William, 2007). Certainly, there is considerable scope for future research to broaden Barke and Nakamura’s study by choosing mathematics classes (a universal “language”) in order to minimize variations in content and the effects of culture.

Whatever their questioning strategy, teachers have to start a lesson with an opening move. In many classrooms, this will be an exploratory question, designed to elicit students’ existing conceptions. However, the way in which teachers then proceed may differ profoundly depending on the broader cultural context within which they work. For example, account must be taken of the complexities introduced by the requirement of the teacher to assume responsibility for organizing the learning of a large number of students (20–40 in the developed world, often much larger in the developing world). Of the many possibilities within this broader agenda, this article

expands on one example. In many communities all over the world, there is an increasing acceptance of a canonical lesson design that may now be sufficiently widespread to qualify as a “signature pedagogy” (Shulman, 2005). The lesson begins with a “big question” (*hatsumon*) that has been carefully designed to lead students toward the intended outcomes (however broadly they may be defined). Students are asked to work on this question in pairs or small groups, and then the teacher conducts a whole-class session in which different groups present their proposals. Typically, the teacher then conducts a whole-class discussion, which is termed *neriage* in Japanese; this word means “kneading,” and was originally applied to the technique of layering, cutting, and re-combining different colors of clay to produce a block with intricate patterns. It is a term used in Japanese education to describe the whole-class interaction phase of structured problem-solving, and it is the core of teaching through problem-solving. This happens after students have shared various solution strategies. During this phase, students, carefully guided by the teacher, critically analyze, compare, and contrast the shared ideas. They consider issues like efficiency, generalizability, and similarity to previously learned ideas (Takahashi, 2008). In conducting the *neriage* session, the teacher must balance a range of different concerns, some of which may conflict with the others. The teacher must retain the focus of learning. If student contributions raise new possibilities, the teacher has to make split-second decisions whether to follow the new thread, or bring the conversation back to where the teacher intended it to be. This is very close to Black and William’s (2009) “moments of contingency.” These momentary learning opportunities arise during dialogue, and teachers need to create and capitalize upon them in order to further learning. The pressure to value every contribution is strong, since as well as advancing the learning of the whole class, the teacher seeks to minimize the sense of rejection that students might feel if their contributions are dismissed (also seen in the work of Canadian researcher, Albert Bandura, 1997).

## Conclusion

Catherine Lewis, a Distinguished Research Scholar from Mills College in Oakland, California was kind enough to send lead author the following communication: “In the U.S., the newspaper accounts of the Tohoku tragedy impressed Americans with their descriptions of the way tens of thousands of displaced people were able to organize survival in schools and other public buildings, by working together...I was struck by how well the basic habits of mind and heart learned in elementary school serve Japanese adults: the sense of responsibility, awareness of others’ needs and feelings, and commitment to everyone’s welfare...I don’t know if any other country so successfully integrates academic learning, social learning, and ethical learning” (personal communication, 2014). It is this high-level integration that Western nations should attempt to

replicate (see, Putney & Broughton, 2010).

At the 2014 Sendai conference, important comments were made by Shin Hamada, a retired principal and part-time lecturer from Akita University. He stated that Tohoku University's collaboration with the OECD (on the 2.0 project) should include the essence of Akita prefecture, as top scorers of the National Scholastic Assessment, through teachers' network and connections (*tsunagari*) and teachers' tacit knowledge. Many Japanese cultural practices, including *kankei* (interrelationships), *kizuna* (bonds), and *kizuki* (with-it-ness), provide much needed empathy for others within this global context (Howe & Arimoto, 2014). As mentioned earlier, *kaizen*, which refers to the continuous improvement down to the smallest and most detailed level of self-introspection, is another important cultural concept. The American adage is often expressed as, "If it ain't broke [if it's not broken], don't fix it." In contrast, the philosophy of *kaizen* is, "if it isn't perfect, improve it." More specifically, "if it isn't perfect when it comes off the end of the production line, redesign it 'till it is" (Scriven 1989).

Tohoku University's first president (1911-1913), Masataro Sawayanagi, formerly Vice Minister of Education, firmly believed that academic research should be integrated with education. Sawayanagi established *kyouiku-kyoujyu-kenkyuukai* (the Institute for Research in Education for Teaching), which is closely related to the education policy of *Monbu-syo* (Education Ministry) and *Teikoku-kyouiku-kai* (the Imperial Educational Society, 1883-1944; later renamed as *Nihon-kyouiku-kai* Japan Educational Society, 1948), and he provided a facility for the advancement of scientific educational research. In 1917, he established Seijo Primary School as a pilot school to transform public education and achieve his own heartfelt ideals. In 1918, Sawayanagi made a classroom visit to an open house and performed a demonstration lesson at Tokyo City's Taisho Elementary School. This was a pioneering act in the development of LS and curriculum design, as he is on record as using the word "curriculum" as early as 1925, and he later wrote that Japan is making a strong effort to understand human nature in the light of her own ancient culture. A great motivator, he strengthened efforts to inspire teachers with confidence and courage. Generally speaking, the Japanese love productive activity and value progress highly. Consequently, the static philosophy of Buddha was reconstructed into a dynamic religion for practical life (Sawayanagi, 1925).

A number of famous philosophers have since interpreted his works, written in the mid to late 1920s and onward, as these were attempts to go beyond the limitations of European neo-Kantian thought by drawing on ideas derived largely from Japanese Buddhism (Nishida, 1965a; Nishida 1965b; Suzuki, 1977 cited in Morris-Suzuki, 1995). Morris-Suzuki (1995) noted that his attempts to go beyond, or transcend the challenges of Japanese culture created by modern

Western cultures are just part of an intellectual tradition that has continued unbroken from the pre-war period to the present day. In 1959, Ezra Vogel of Harvard University began his sociological/anthropological fieldwork in Japan. Following his emeritus, Tetsuro Sasaki from the Faculty of Education at Tohoku University helped his fieldwork at Kesenuma, Oshima, and Onagawa in Miyagi prefecture. After more than two decades of dedicated research, he concluded that, “if any single factor explains Japanese success, it is the group-directed quest for knowledge” (Vogel, 1979).

There is a consensus that Japan should reach beyond and move toward educational reform as actively as possible. Recently, Shields (2009), asserted that to succeed, educational reform initiatives need to transcend external institutional change and connect to a process of inner transformation rooted in a society’s historic cultural foundations. One such approach is the study of sacred architectural sites that provide unique and powerful research tools for studying cultural meaning, education, social change, and the basis for analysis of the relationship between religion, education, and social reform. There are many fundamental Japanese cultural conceptual themes, for example the “Ba” perspective, but that proposition must wait for another day.

Going forward, the Australian team who attended Fredericton in 2014 has tentatively proposed the next cultural exploration—a gathering in Australia in 2016, and Canadians have recently established the “Canadian Assessment for Learning Network (CAfLN).” As global educational institutions seek to go beyond and transcend the limits of their current systems, so Japan must continue the foundational and pioneering work of Masataro Sawayangi by drawing deeply on its rich cultural heritage before taking the plunge into the future by establishing the “*Japanese* Assessment for Learning Network” (JAfLN).

## References

- Allal, L. (2011). Pedagogy, didactics and the co-regulation of learning: A perspective from the French-speaking world of educational research. *Research Papers in Education*, 26(3), 329-336.
- Allal, L., & Pelgrims Ducrey, G. (2000). Assessment of—or in—the zone of proximal development. *Learning and Instruction*, 10(2), 137-152.
- Arimoto, Masahiro. (1995). Japanese Educational System Improving Ongoing Practice in Schools. *School Effectiveness and School Improvement*, 6(4), 380-388.
- Arimoto, M., & Ishimori, H. (2013). Reconceptualizing assessment for learning from culturally embedded pedagogy to add further impetus to curriculum as a school-based initiative. *東北大学大学院教育学研究科研究年報*, 62(1), 303-323.
- Arimoto, M., & Goda, Y. (2013). *Classroom-embedded assessment based on subject differences for high school teachers focused on “learning to learn” behind the PISA*. (Ikeda, K. Unpublished Master’s Thesis. Graduate School of Education: Tohoku University) [http://www.iaea.info/documents/paper\\_5bc1e290.pdf](http://www.iaea.info/documents/paper_5bc1e290.pdf)

- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117-148.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. NY: Freeman.
- Barke, J., & Nakamura, I. (2012). Culture in the classroom: A comparative study of classroom discursive management strategies. *The Foreign Language Journal*, 7, 1-16.
- Bennett, R. (2011). Formative assessment: A critical review. *Assessment in Education*, 18(1), 5-25.
- Black, P., & William, D. (2006). Assessment for learning in the classroom. In J. Gardner (Ed.), *Assessment and learning* (pp. 9-25). London: Sage.
- Black, P., & William, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, 21(1), 5-31.
- Bransford, J., Derry, S., Berliner, D., Hammerness, K., & Beckett, K. L. (2005). Theories of learning and their roles in teaching. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 40-87). San Francisco, CA: Jossey-Bass.
- Bromme, R., & Steinbring, H. (1994). Interactive development of subject matter in the mathematics classroom. *Educational Studies in Mathematics*, 27(3), 217-248.
- Brookhart, S. M. (2007). Expanding views about formative assessment: A review of the literature. In H. McMillan (Ed.), *Formative assessment classroom: Theory into practice* (pp. 29-42). New York, NY: Teachers College Press.
- Center for the Future of Teaching and Learning. (1998). *The status of the teaching profession: Summary report*. Santa Cruz, Ca: Center for the Future of Teaching and Learning.
- Central Council for Education/MEXT. (1996). *Priorities for a lifelong learning society: Increasing diversification and sophistication chapter 3. The future of lifelong learning section 3. Encouraging zest for living*. Tokyo: MEXT. Retrieved from [http://www.mext.go.jp/b\\_menu/hakusho/html/hpae199601/hpae199601\\_2\\_042.html](http://www.mext.go.jp/b_menu/hakusho/html/hpae199601/hpae199601_2_042.html)
- Chenoweth, K. (2000). Homeroom column. *Montgomery Extra*, Rockville, MD.
- Clark, I. (2008). Collaborative learning: The cultural barriers to effective language acquisition in Japanese classrooms. *Journal of English as an International Language*, 3, 99-126.
- Clark, I. (2011). Formative assessment: Policy, perspectives and practice. *FJEAP*, 4(2), 158-180.
- Clark, I. (2012). Formative assessment: Assessment is for self-regulated learning. *Educational Psychology Review*, 24, 205-249.
- Clark, I. (2014). Equitable learning outcomes: Supporting economically and culturally disadvantaged students in 'formative learning environment'. *Improving Schools*, 17(1), 116-126.
- Chichibu, T., & Kihara, T. (2013). How Japanese schools build a professional learning community by lesson study. *International Journal for Lesson and Learning Studies*, 2(1), 12-25.
- Dunn, K., & Mulvenon, S. (2009). A critical review of research on formative assessments: The limited scientific evidence of the impact of formative assessment in education. *PARE*, 14(7), 1-11.
- Eisner, E. (2005). What can education learn from the arts about the practice of education? In E. Eisner (Ed.), *Re-imagining Schools: The selected works of Elliot E. Eisner* (pp. 205-214). NY: Routledge.
- Fernandez, C., & Yoshida, M. (2004). *Lesson study: A Japanese approach to improving mathematics teaching and learning*. New York: Erlbaum.

- Fereshteh, M.H. (1992). *The U.S. and Japanese education - should they be compared*. Paper presented at Lehigh University's conference on education and economics in technologically advancing countries. Bethlehem, PA.
- Goddard, R. (1998). *The effects of collective teacher efficacy on student achievement in urban public elementary schools*. Dissertation, Ohio State University.
- Goddard, R. D., Hoy, W. K., & Woolfolk Hoy, A. (2000). Collective teacher efficacy: Its meaning, measure, and effect on student achievement. *American Education Research Journal*, 37, 479-507.
- Goos, M., Galbraith, P., & Renshaw, P. (2002). Socially mediated meta-cognition: Creating collaborative zones of proximal development in small group problem solving. *Educational Studies in Mathematics*, 49(2), 192-223.
- Hallam, S., Kirton, A., Pfeffers, J., Robertson, P., & Stobart, G. (2004). *Evaluation of Project 1 of the Assessment is for Learning development programme: Support for professional practice in formative assessment*. London: Institute of Education, University of London.
- Harrison, C. (2009). Assessing the impact of assessment for learning 10 years on. *Curriculum Management*, November 2009, 4-10.
- Hatano, G., & Inagaki, K. (1986). Two courses of expertise. In H. Stevenson, H. Azuma & K. Hakuta (Eds.), *Child development and education in Japan* (pp. 263-272). Freeman & Co.
- Hattie, J. (1999). *Influences on student learning*. University of Auckland, New Zealand: Inaugural professorial lecture. Retrieved from [citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.114.8465.pdf](http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.114.8465.pdf)
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.
- Hayward, L., & Spencer, E. (2010). The complexities of change: Formative assessment in Scotland. *Curriculum Journal*, 21(2), 161-177.
- Holloway, S. D. (1988). Concepts of ability and effort in Japan and the United States. *Review of Educational Research*, 58, 327-345.
- Howe, E., & Arimoto, M. (2014). Narrative teacher education pedagogies from across the pacific. *Advances in Research on Teaching*, 22, 217-238.
- Krill, A. L., & Platek, S. M. (2012). Working together may be better: Activation of reward centers during a cooperative maze task. *PLoS ONE*, 2, e30613. doi:10.1371/journal.pone.0030613.t002
- Lebra, T. (1976). *Japanese patterns of behavior*. Honolulu: The University Press of Hawaii.
- Lent, R. W., Schmidt, J., & Schmidt, L. (2006). Collective efficacy beliefs in student work teams: Relation to self-efficacy, cohesion, and performance. *Journal of Vocational Behavior*, 68, 73-84.
- Lewis, C. (2002). Does lesson study have a future in the United States? *Nagoya Journal of Education and Human Development*, 1(1), 1-23.
- Looney, J., & Poskitt, J. (2005). New Zealand: Embedding formative assessment in multiple policy initiatives. In OECD (Ed.), *Formative assessment: Improving learning in secondary classrooms* (pp. 177-184). Centre for Educational Innovation and Research. Paris: OECD.
- Maher, J., & William, D. (2007). *Tight but loose: scaling up teacher professional development in diverse contexts*. Symposium at the annual conference of the American Educational Research Association. Chicago, IL: AERA.
- Mantero, M., & Iwai, Y. (2005). Reframing English language education in Japan. *Asian EFL Journal*, 7(2), 164-173.
- Marshall, B. (2004). Goals or horizons - the conundrum of progression in English, or a possible way of understanding

- formative assessment in English. *Curriculum Journal*, 15, 101–113.
- Minami, M., & McCabe, A. (1991). Haiku as a discourse regulation device: A stanza analysis of Japanese children's personal narratives. *Language in Society*, 20, 577–599.
- Morris-Suzuki, T. (1995). The invention and reinvention of "Japanese culture." *The Journal of Asian Studies*, 54(3), 759–780.
- OECD/CERI. (2005). *Formative assessment: Improving learning in secondary classrooms*. Paris: CERI/OECD.
- Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 250–284). San Diego: Academic Press.
- Pollard, A. (2002). *Readings for reflective teaching*. London, UK: Continuum.
- Prior, J., & Crossouard, B. (2008). A socio-cultural theorization of formative assessment. *Oxford Review of Education*, 34(1), 1–20.
- Purdie, N., & Hattie, J. (1996). Cultural differences in the use of strategies for self-regulated learning. *American Educational Research Journal*, 33(4), 845–871.
- Purdie, N., Hattie, J., & Douglas, G. (1996). Student conceptions of learning and their use of self-regulated learning strategies: A cross cultural comparison. *Journal of Educational Psychology*, 88(1), 87–100.
- Putney, L., & Broughton, S. (2011). Developing collective classroom efficacy: The teacher's role as community organizer. *Journal of Teacher Education*, 62(1), 93–105.
- Rogoff, B. (2003). *The cultural nature of human development*. NY: OUP.
- Salamone, J., & Correa, M. (2012). The mysterious motivational functions of mesolimbic dopamine. *Neuron*, 76, 470–485. doi: 10.1016/j.neuron.2012.10.021
- Sawayanagi, M. (1925) Japan. *Teachers College Record*, 1(1), 285–308.
- Scriven, M. (1989). *Evaluation thesaurus*. Thousand Oaks, CA: Sage.
- Shields, J. (2009). *Sacred architecture, religious traditions and education in Japan*. Paper presented at the Annual Conference of the Comparative and International Education Society. Toronto, Ontario, Canada.
- Schilbach, L. (2014). On the relationship of online and offline social cognition. *Frontiers in Human Neuroscience*, 8, 278. doi: 10.3389/fnhum.2014.00278
- Schön, D. (1987). *Educating the reflective practitioner*. San Francisco: Jossey-Bass.
- Scottish Government. (2011). *Curriculum for excellence: Building the curriculum 5 a framework for learning and teaching*. Edinburgh, UK: Scottish Government. Retrieved from [http://www.educationscotland.gov.uk/Images/BtC5Framework\\_tcm4-653230.pdf](http://www.educationscotland.gov.uk/Images/BtC5Framework_tcm4-653230.pdf)
- Sebba, J. (2012). Policy and practice in assessment for learning: The experience of selected OECD countries. In J. Gardner (Ed.), *Assessment and learning* (pp. 157–170). London, UK: Sage.
- Shinkawa, M., & Arimoto, M. (2012). Research for Japanese-like competency and assessment through challenges of eager schools for sustainability after the great earthquake and tsunami. *International Journal of Sustainable Development*, 3, 61–69.
- Shulman, L. (2005). Signature pedagogies in the professions. *Daedalus*, 134, 52–59.
- Stanley, G., MacCann, R., Gardner, J., Reynolds, L., & Wild, I. (2009). *Review of teacher assessment: Evidence of what*

- works best and issues for development*. Centre for Educational Assessment; Oxford University.
- Stiggins, R. (2007). Conquering the formative assessment frontier. In H. McMillan (Ed.), *Formative classroom assessment: Theory into practice* (pp. 8–28). New York, NY: Teachers College Press.
- Stigler, J., & Hiebert, J. (1999). *Teaching gap*. New York: The Free Press.
- Takahashi, A. (2008). *Neriage: An essential piece of a problem-based lesson. Teaching through problem solving: A Japanese approach*. Paper presented at the Annual conference of the National Council of Teachers of Mathematics. Salt Lake City, UT.
- Takanashi, Y. (2004). TEFL and communication styles in Japanese culture. *Language Culture and Curriculum*, 17(1), 1–14.
- Tiknaz, Y., & Sutton, A. (2006). Exploring the role of assessment tasks to promote formative assessment in Key Stage 3 geography: Evidence from twelve teachers. *Assessment in Education*, 13(3), 327–343.
- Vogel, Ezra. (1979). *Japan as number one: Lessons for America*. Cambridge, Mass: Harvard University Press.
- Vogt, F., & Rogalla, M. (2009). Developing adaptive teaching competency through coaching. *Teaching and Teacher Education*, 25(8), 1015–1060.
- Vygotsky, L. S. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.
- Walker, R. (2010). Sociocultural issues in motivation. In P. Peterson, E. Baker, B. McGaw (Eds.), *International encyclopedia of education* (pp. 712–717). Oxford: Elsevier.
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press.
- Willis, J. (2010). Assessment for learning as a participative pedagogy. *Assessment Matters*, 2, 65–84.
- William, D. (2007). Keeping learning on track: classroom assessment and the regulation of learning. In Frank, K., & Lester, Jr., (Eds) *Second handbook of research on mathematics teaching and learning: A project of the National Council of Teachers of Mathematics* (pp. 1053–1098), Charlotte, NC: IAP.
- William, D. (2011). What is assessment for learning? *Studies in Educational Evaluation*, 37, 3–14.
- William, D., & Leahy, S. (2007). A theoretical foundation for formative assessment. In James H. McMillan (Ed.), *Formative classroom assessment: Theory into practice* (pp. 29–42). New York: Columbia University.
- Wolfe, S., & Alexander, R.J. (2008). *Argumentation and dialogic teaching: alternative pedagogies for a changing world*. London, UK: Futurelab. <http://www.robinalexander.org.uk/docs/wolfealexander.pdf>
- Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17(2), 89–100.
- Wray, H. (1999). *Japanese and American education: Attitudes and practices*. Westport, Connecticut: Bergin & Garvey.
- Yoshida, M. (1999). *Lesson study: A case study of a Japanese approach to improving instruction through school-based teacher development*. Doctoral dissertation, University of Chicago.
- Zimmerman, B. J., & Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, 23(4), 614–628.