Chapter 16
Constructing Formative Assessment Strategies

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Abstract For years, formative assessment has been a popular topic for educational reforms across the globe. This form of assessment demands high level of student participation and teachers' continuous feedback during and after instruction time and is recommended as a useful means of learning for students in both the schools and higher education institutions in the twenty-first century. The current chapter discusses the underpinnings of formative assessment, being a newly promoted assessment concept in the education literature. It explores the main theories in formative assessment and its relationships with student motivation and self-regulated learning. The chapter further discusses exemplar formative feedback practices derived from this body of the literature, and they are research-based practices applicable to different classroom settings. Suggestions are made to recognize formative assessment as an important strategy of reforming education; this echoes the ideas of scholarship of learning and teaching (SoLT) in promoting professional learning for improving student learning.

Keywords Formative assessment · Formative feedback · Motivation · Self-regulation · Confucian heritage culture

16.1 Introduction—The Current Trends of Assessment in Education

This chapter discusses the trends of promoting formative assessment in the education systems over the world, with a special focus on the situation of Hong Kong being a Confucian heritage society, in which its education is often described as examination oriented. It discusses how this new assessment approach serves to benefit student learning, by relating to the theories of motivation and self-regulated

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S.C. Kong et al. (eds.), *Emerging Practices in Scholarship of Learning and Teaching in a Digital Era*, DOI 10.1007/978-981-10-3344-5_16

learning, establishing its roots in the psychology literature. It also includes exemplar practices of practitioners' experimentation of formative assessment in both the school and higher education sector, describing research-based pedagogies and methods that scholar-teachers have put on trial for this newly promoted assessment concept.

Based on both the theoretical and empirical literature, this chapter combines the ideas of classroom-based formative assessment practices with the theoretical construction of such practices, illustrating ways of how scholar-teachers can create scholarship of teaching by implementing innovative practices to improve student learning. Since formative assessment has only been promoted recently and it is a relatively new concept in the education community, extensive practices have yet to be developed and thus a comprehensive review on practice has not been found. If formative assessment is to make influence on learning and teaching, a review of theoretical literature supplement with examples of scholarly/research-based practice may address the issues, and it would stimulate more discussions on the topic and create more research-led teaching practices to benefit student learning. The theoretical framework provided in this chapter can act as a guide to practitioners who are interested in promoting learner-centered pedagogies. It echoes the idea of SoLT as practitioners can reach a high scholarly standard in their practices, by experimenting and innovating practices that are both supported by sound theoretical underpinnings, and exemplars ensure positive outcomes of learning, and the approach of framing a feasible and meaningful study in the area.

This chapter is developed based on the following key questions: What is formative assessment and what are the claims for formative assessment as a trend in education worldwide and in an oriental society such as Hong Kong? What are the exemplar practices of formative assessment derived from this body of the literature? How can formative assessment be implemented in an oriental society such as Hong Kong where examination is seen as a dominant feature?

The word assessment comes from the Latin verb *assidere*, meaning "to sit beside" (Musial, Nieminen, Thomas, & Burke, 2009). It implies the process by which people get together to evaluate the educational experience and the ways to make it more meaningful. Broadly defined, assessment is the process of documenting outcomes, usually in measurable terms, on knowledge, skills, attitudes, and beliefs. Assessment includes summative and formative ones: The former aims at measurable outcomes of achievement, while the latter serves as support to enhance outcomes by offering feedback and as a scaffolding tool to support student learning to seek improvement.

Traditionally, education was characterized as a one-way traffic based solely on the teacher's transmission, where learners passively absorb preprocessed information and then regurgitate it in response to periodic examinations (McCarthy & Anderson, 2000). In the twenty-first century, educational reforms put forward ways of recognizing the learners in the educational process (Henson, 2015; Lam, 2008; Furlong, 2008), by means of shifting the responsibilities of organizing, analyzing, synthesizing, and evaluating content from the teacher alone to the students as well (Lam, 2008, 2011a; Means, 1994). With such noticeable shift in conceptions of

teaching and learning, a relative parallel shift in relation to beliefs about assessment from summative to formative has emerged and even gradually begun to influence worldwide over the past few decades through educational reforms (Carless, 2012; Taras, 2005; Yorke, 2003). Along with the summative function of assessment as a major policy lever for improving education through comparisons among schools against standards (Shavelson et al., 2008), formative assessment has increasingly been viewed as an integral part of teaching and learning process worldwide.

In Hong Kong, a local report entitled "Learning to Learn—The Way Forward in Curriculum Development" (2001) was proposed by the Curriculum Development Council (CDC) to set the key directions for curriculum reform in Hong Kong with the ultimate goal to raise the quality of education and levels of student achievement. In line with the visions and overall aims of education for the twenty-first century worldwide, the Hong Kong school curriculum aimed at the development of higher-order skills and the idea of "learning to learn." As a reform agenda, "Assessment for Learning" (AfL) was introduced and recommended with great emphasis (CDC, 2001). Along with the traditional culture of formal examinations in Hong Kong as "Assessment of Learning" (AoL), which is to measure how much and how well students have achieved, formative assessment focuses on developing learner's capabilities of being able to learn independently and developing learners to actively engage in learning. One of the suggestions made by the CDC (2001) stated the values of formative assessment:

> Schools and teachers can use feedback (e.g. informal, formal, verbal, written), whenever appropriate, to inform students of their strengths and weaknesses. Students will then be motivated by recognition of their achievements and they will also know what steps they need to take to address their weaknesses (p. 81).

It can be duly observed that the curriculum makers have been making attempts to improve the assessment culture of Hong Kong with the insight that assessment can help to provide information for both students and teachers to improve learning and teaching, to support student learning ultimately (Black & Wiliam, 2009). Formative assessment not only has impacts on school education, the higher education sector also increasingly follows suit (Mok & Cheung, 2011; University Grants Council, 2010). The University Grants Council (2010, p. 83), for instance, has explicitly urged that "institutions and individual academics should take account of this literature (the ones on learner-centered pedagogies) in their curriculum design and faculty development programmes to improve teaching." In fact, in the educational environment of higher education, attention on feedback was not as great as it was reflected in the school literature. Until recent years, evaluation report of higher education indicated that effectiveness of feedback was one of the least satisfactory aspects of students' university experiences (see Yang & Carless, 2013; Radloff, 2010).

16.2 Formative Assessment, Self-regulated Learning, and Learning Motivation

> When the cook tastes the soup, that's formative; when the guests taste the soup, that's summative (Scriven, 1967, p. 63).

Michael Scriven appeared to be the one who made the very first usage of the term "formative" in relation to curriculum and teaching in an Evaluation Thesaurus in 1967 (Black & Wiliam, 2003), to indicate an ongoing refinement process in educational evaluation. By referring to the same spirit as described in this metaphor, formative assessment is used to mean the assessment that is intended to generate feedback on performances to improve and accelerate learning (Sadler, 1998). Above all, for an assessment to be formative rather than summative, it requires additional feedback and a direction of how teachers and students can improve accordingly and, respectively, so as to reach the expected standard by creating an informative and shared assessment community (Lam, 2011b). This coheres with Sadler's (1989) explanation about formative assessment that:

> *Formative assessment* is concerned with how judgements about the quality of student responses (performances, pieces, or works) can be used to shape and improve the students' competence by short-circuiting the randomness and inefficiency of trial-and-error learning (p. 120).

It can be noted that the focus of formative assessment is more on judgements about the quality of student work and then how such assessment judgements may be put to use in bringing about possible improvement in various aspects during the ongoing teaching and learning process. Apart from this, with years of research on the issues of assessment, Black and Wiliam (2009) endeavored to develop the theory of formative assessment. They defined that:

> Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that elicited (p. 9).

From this definition, it is clear that formative assessment is devoted to achieve the precise purpose of "regulating learning processes" in order to improve teaching and learning, by making a good use of the evidence or information elicited in the learning and teaching processes. Since the formats of eliciting information and gathering evidence are wide-open to teachers' preferences and pedagogical choices, formative assessment is still open to discussion with numerous possible interpretations. The consensus is that the key of formative assessment is to do with teachers' attempts in eliciting and interpreting evidence for the purpose of enhancing instruction to improve student learning. To be able to achieve this purpose, strategies of carrying out formative assessment are often associated with the literature of motivation as well as self-regulated learning—the former determines a healthy status of accepting assessment information, and the latter supports

learners to manage the way they learn and what they can do more to improve learning as a whole.

Black and Wiliam (2009) suggested that the key of designing formative assessment strategies should be on how successful teachers can activate students as owners of their own learning, which brings in metacognition (Hacker, Dunlosky, & Graesser, 1998), motivation (Ryan & Deci, 2000), and self-regulated learning (Boekaerts, Maes, & Karoly, 2005). This underpinning holds true by referring to what Vygotsky's (1978) dictum suggested from his "Mind in Society" in which he mentioned that cognitive growth is encouraged by creating cognitive conflict:

> ……learning which is oriented toward development levels that have already been reached is ineffective from the viewpoint of a child's overall development. It does not aim for a new stage of the developmental process, but rather lags behind this process. The only good learning is that which is in advance of development (p. 82).

In line with the above statement, by utilizing assessment as a platform to challenge learners to reflect on their own thinking, teachers and their peers offer a helping hand to learners in a way that cognitive processes are made overt and explicit, thus making the assessment process and result more readily available for future use. Such emphasis on creating cognitive conflict (instead of simply giving right or wrong answers), and on metacognition that involves learners' reflection on their learning process, was claimed to make clear the essentiality of formative assessment in teaching and learning (Black & Wiliam, 2009). It draws teachers' and educators' attention to identifying the gaps between learners' current learning status and the desired or expected educational goals. As explained by Vgyotsky (1978), this gap is referred as the zone of proximal development (ZPD), and learners can reach this zone under the guidance of an adult, or in collaboration with a more expert peer.

Thus, the idea of improving learning through formative assessment depends not only just on teachers but also on the active involvement of learners, often through the forms of self-assessment and peer assessment. As explained by Sadler (2010), formative assessment enables learners to engage into a metacognitive process, with the support by teachers to facilitate goal setting, self-manage one's own learning progress, and provide informed evaluative judgement from time to time. The concept of "self-regulated learning" has gained prominence in the education literature in recent decades. In its broadest sense, it refers to all learning processes in which the learner treats acquisition of knowledge as a systematic and controllable process. According to Pintrich and Zusho (2002):

> Self-regulated learning is an active constructive process whereby learners set goals for their learning and monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features of the environment (p. 64).

A self-regulated learner is the one who proactively pursues information he/she needs to enhance his/her learning and take steps to master the learning. Self-regulated learners possess academic skills; hence, they rely on themselves in learning.

According to Zimmerman (2002), self-regulated learners are used to engage in "metacognition," meaning that they monitor and keep track of how they themselves think and learn and seek to come up with better approaches toward learning. Self-regulated learners show high levels of intrinsic motivation toward their learning, and they are eager learners who kick-start learning on their own and are extraordinarily persistent in their learning. Self-regulated learners demonstrate high levels of self-efficacy in learning (Labuhn, Zimmerman, & Hasselhorn, 2010), believing that they are capable of success and independent in their initiatives to learn (Pajares, 2002; Stoeger & Ziegler, 2008). They think of their success in learning as caused by their own efforts and competence (Cantor, 1990; Zimmerman, 2002). In fact, as learners, school students are engaged in a challenging process of acquiring knowledge from the unknown to the level of mastery. In order to learn more and better, students should be trained to be self-regulated in learning. Self-regulation refers to the mental abilities and skills which can be shown in cycles of reflection on learning, monitor of known knowledge, and consideration of future action plan (Zimmerman, 2002). The focus of education nowadays is placed on boosting learners' self-regulated learning strategies and their intrapersonal intelligence, which aims to develop students as self regulated learners who are also lifelong learners who keep learning in their lifetime.

It should be particularly noted that feedback practices, no matter elicited by teachers or peers, in verbal, written, or other forms, founded steadily the prime core of formative assessment. In practicing formative assessment, learners are given room to digest the feedback received from the others, doing self-assessment and evaluating their performance. This process demonstrates a self-regulating process of learning, in which learners are actively regulating internally their thinking, motivation, and behavior:

> Self-regulation can be defined as a multi-component, multi-level, iterative, and self-steering process that targets one's own cognitions and feelings, actions, as well as features of the environment for modulation in the service of one's goals (Boekaerts, Maes, & Karoly, 2005, p. 250).

The monitoring of feedback in the learning process can successfully drive learning (Nicol & Macfarlane-Dick, 2006). Empirical studies also show a positive relationship between formative assessment and student motivation (Brookhart, 1997; Black & Wiliam, 1998). Motivations refer to the drive of a person in pursuing their intended goals, and it determines the willingness and effort of taking initiative to learn and the emotional engagement in a particular task (Ryan & Deci, 2000). Motivation can also be divided into two types: being intrinsically motivated means that the person is committed to the goal because of the inherent pleasure associated with the pursuit itself versus a person extrinsically motivated in working on a task who may not develop strong interest in the matter. Brookhart (1997) stated in her study that the feedback information which students can use to make themselves more competent is attributed to the effect of being more intrinsically motivated. Moreover, Cauley and McMillan (2010) explained that if provided with a supportive and trusting environment in which formative assessment is practiced,

positive effect on motivation and learning can be achieved. A classroom where formative assessment is implemented can be characterized as informal, spontaneous and engaging; by which learners' intrinsic motivation can be developed.

Based on a sample of 558 students from the Dutch secondary vocational schools, Pat-El, Tillema, and van Koppen (2012) found that formative feedback (in modes of monitoring and scaffolding) worked positively among the different ethnic student groups in promoting their intrinsic motivation. Noticeable observation showed that students valued the teacher's proximity as this had helped them accept the feedback received in the classroom. Another action research was implemented in a level-three, compulsory module in the program *Health Studies and Nursing* for the degree of Bachelor of Science, at the University of Sunderland (Cooper, 2000). Among the 61 part-time students, it was reported that students were initially unmotivated in studying the courses, and they felt unsure about the formative feedback they received on their assignment draft. In their second or later attempts of reworking on their assignment, students expressed more positive attitudes to formative feedback as "the feedback was explicitly identified as assisting development" and the students described themselves as "adopting a more objective approach to their own work" (p. 284). The changes had brought about a new kind of learning experience in the course for the students. Another study by Hwang and Chang (2011) reported the adoption of mobile learning to introduce interactive feedback between teacher and students could stimulate self-regulated learning among university students, concluding with a fruitful result that "the approach has provided a more challenging learning environment that encourages students to solve the problems on their own" (p. 1031). Such formative assessment strategy was identified as effective in helping students attain better academic achievement.

The empirical literature provides evidences to the proposition that feedback elicited through formative assessment strategies can regulate the learning process for learners and to effect changes on one's motivational belief. The aforementioned examples suggest that viewing the process of formative assessment as solely a cognitive process (i.e., with the involvement of transferring and receipt of information for future improvement) would definitely underestimate, if not ignore the educational benefits that formative assessment carries. The work by Dweck (2000) gives proof to the way that feedback can foster student engagement in learning because of the increased interest. To make feedback a positive learning experience for learners, formative assessment in teaching can be regarded as the key to educational improvement. Contrarily, obsessive summative assessment was found to have lowered learners' motivation to learn with research evidences provided. According to Harlen and Deakin Crick (2003), summative assessment drew learners' attention to focus narrowly on performance outcomes instead of the learning processes. Brookhart (1997) identified that formative assessment worked well in both classroom and large-scale assessments.

16.3 Principles of Formative Assessment Practice

Carless (2012) believes that "good teaching and formative assessment are directly linked" (p. 7). As the value and benefit of formative assessment were recognized by empirical studies, the methodologies, strategies, and tools of how it can be used determine its effectiveness. This section attempts to provide the guidelines in planning formative assessment by citing representative authors in this field of study.

Black and William (2009) suggested five types of activities which can be based upon for carrying out formative assessment. They were generated from the empirical experience of in-service teachers:

- Sharing success criteria with learners
- Classroom questioning
- Comment-only marking
- Peer- and self-assessment
- Formative use of summative tests

In addition to the above formative assessment strategies, Carless (2012) has recently constructed a composite of formative assessment strategies. They include the following:

- Sharing learning intentions and success criteria
- Questioning as the means of engineering productive classroom discussions and dialogues
- Peer learning and assessment activating students as learning resources for each other
- Self-assessment involving students in monitoring the quality of their work
- Extensions of Strategies 3 and 4, which involve students in taking ownership of their learning through learning to learn
- Feedback that helps move learning forward
- The formative use of tests designed principally for summative purposes

Carless (2012) also explained that "each of the strategies involves the elicitation of evidence which is used by students, peers or teachers to inform the learning process" (p. 8). The sharing of various important messages to learners was suggested by Black and Wiliam (2009) and Carless (2012) with very similar wordings, if not exactly the same. They emphasized that students have to be informed of their performance so as to be aware of what they are trying to learn. Such importance was highlighted by Clarke (1998):

> Without the "secret" knowledge of the learning intention, …children have been deprived of information that will not only enable them to carry out the task more effectively, they have also been denied the opportunity to self-evaluate, communicate this to the teacher, set targets for themselves and get to understand their own learning needs; in other words, to think intelligently about their own learning (p. 47).

This knowledge or information to be provided to learners is in line with the prime focus of formative assessment, addressing the importance of students'

acknowledgement of the expected learning standards, for which they will aim at and acquire, through interaction between both teachers and learners as the means.

Another most commonly applied strategy of formative assessment is the use of questioning. The key purpose of asking questions, as stated by Black and Wiliam (2004), is to collect information that is useful to the teacher or to raise issues that the students need to think about. The questioning strategies that work as formative assessment are typically the open-ended, higher-order questions (Hodgen & Webb, 2008). It is believed that these types of questions can create a dialogue that includes feedback from both the teacher and students. To be involved in a question-and-answer flow of dialogue, students can articulate what they know during the learning process and thus can help elicit a broader and further range of thinking in a cycle of ongoing learning.

Apart from this, self-assessment and peer assessment are recommended as the key formative assessment strategies conducted by students. Comments or feedback from peers provides insights that help learners to raise internal awareness of the performances of their own work, driving learners to become sensitized to the expected standards in learning. Self-assessment, in Sadler's (1989) classic phrase, is "the possession of evaluative expertise as a necessary (but not sufficient) condition for improvement" (p. 138). Accordingly, as concluded by Black and Wiliam (1998), opportunities for learners to express their understanding will need to be maintained in the teaching and learning processes and that peer- or self-assessment activities can be designed to play such a role.

Feedback elicited from assessment is critical as it challenges learners to take note of the gap between their current works and the required standards. Thus, it was included by Carless (2012) as a distinct property for formative assessment. The essentiality of feedback was highlighted by Rolfe and McPherson (1995), stating that if used appropriately, feedback can motivate learners and redirect their learning toward the area of deficiency and can help teachers improve their coursework and instructional method. Tracing back to even earlier work by Sadler (1989), feedback in formative assessment had been conceptualized as having three components: (a) an understanding of the standard being aimed for, (b) comparing the standard with the current level of performance, and (c) taking appropriate action to close the gap between a and b. To put it more succinctly, it prompts learners to think about: Where am I going? How am I going? Where to go next? After all, if successful feedback practice is integrated into regular classroom environment, learner's reflection, evaluation, and redirection would be elicited, as Black and Wiliam (2003) concluded "good feedback causes thinking" (p. 631).

Another strategy that is commonly adopted by teachers is the idea of formative use of summative tests. In fact, teachers and students need to encounter both summative assessment and formative assessment in the real setting of the school curriculum. On that account, using summative assessment formatively by introducing series of short "tests" may work well in order to move student learning forward in smaller steps (instead of taking place only at the end of school term). Carless (2012) claimed that such strategy has potential to "create positive synergies between summative and formative assessment; and it has potential to carry traction

with teachers in test-dominated settings" (p. 11) as Carless (2012) argued that summative assessment and formative assessment are interlinked and that teachers need to find innovative ways of making them coexist so that they can support ongoing student learning to suit the environment of their unique classrooms. However, teacher should carefully consider about the setting of conducting the formative assessment tasks, as high frequency of tasks carried out in a competitive environment may evoke stress among students.

16.4 Research-Based Formative Assessment Strategies

The empirical literature on formative assessment is still at its infancy in the literature compared with its theoretical conceptualization as well as other dominant forms of assessment such as summative assessment approaches. In this session, formative assessment practices are discussed, and these research-based practices can illustrate the theories we introduced above.

16.4.1 In-Progress Feedback to Students on Assignments

Using writing intervention in a first-year undergraduate program, Wingate (2010) found that formative assessment on students' drafts-in-progress can improve student learning outcomes. It was observed that students who can utilize the feedback they had received did improve in the areas on which critical comments were received and that they did not make the same mistakes in that piece of assignment. According to Juwah et al. (2004), submitting drafts enables learners to acquire better results and makes them engaged in studying the course. In a quantity surveying course, teachers created opportunities for learners to receive feedback on the draft pieces at any time during the learning process in the course period. By giving learners timely advice, learners sought tutors' comment actively and they self-corrected their own work (Juwah et al., 2004) by considering tutor's comment. Comparing with the ordinary practice of receiving a final grade, learners were encouraged to learn through the assessment process in this study. They come to realize that they can make improvement to their own study through the uptake of feedback.

In the case of Lam (2011a–c), specific feedback strategies were introduced to students. By involving students in dialogues of discussing their project in groups, students who studied in the Teacher Education programs often received prompts from the teacher, e.g., "as you state that……how did you arrive to this conjecture?". Summarizing the overall feedback she had given to students, Lam (2011a–c) did intentionally consolidate the common problems encountered by students in a whole class session; by doing so, students were able to learn from others' problems and the skills of solving a specific issue, and they also learned to troubleshoot and

produce higher quality coursework. This process can, at the same time, help teachers understand students' abilities so that they can provide effective instructions that cater to the needs of students.

16.4.2 Criteria Instrument as a Feedback Tool

Juwah et al. (2004) described how teachers can train students to self-assess their own learning upon the intended learning outcomes of a course. By providing a criteria sheet which tells about the levels of expected learning outcomes of an accounting course, students were required to submit their assignment to an e-platform. In responding to students' work, teachers specified the grades to students (e.g., grade 6 was outstanding, and grade 5 was a very good grade) and she also marked each piece of students' work against the criteria sheet and offered tailor-made feedback to students whenever a point of clarification was necessary. The feedback and grade were e-mailed to students, with an agreed understanding that the grade given was provisional. Students were encouraged to read teachers' comment against the marking criteria, and they were encouraged to respond to teachers' feedback via e-mail to continue the learning loop even when the results were being received. This helps them to do better in the subsequent assignments.

16.4.3 Ongoing Instructional Support and Diagnosis of Learning Needs

In Western countries, formative feedback has been widely experimented in schools. Deirdra Grode, a primary teacher, had faced the problems with students' low scores in examinations (Buczynski, 2009). Deirdra discovered that some students were unable to follow teachers' instruction and had difficulties in moving themselves to study on the next more challenging topic, as they experienced hardships in mastering knowledge of the subject matter. Many students were unable to make improvement and that they were upset.

Utilizing from the literature on the strength of formative assessment, Deirdra continuously assessed students' learning performances by collecting information on students' strengths and weaknesses to keep track of students' individual progress and their learning profile. She was able to evaluate on the learning difficulties encountered by students and offered specific help to cater for individual differences. For instance, she retaught a topic to the low-achieving students in small group and individual consultation based on the diagnostic results of students' work. She also modified her classroom language such as speaking in more elaborated terms and giving authentic examples. Through identifying learners' problems and offering remedial instructions persistently, she was able to narrow the gap between students'

actual learning and desired learning. The wide range of creative formative strategies was also successful in motivating students to learn and improving their learning outcomes.

16.4.4 Project Learning as Formative Assessment

Weurlander, Söderberg, Scheja, Hult, and Wernerson (2012) conducted an action research to explore students' experiences of different methods of formative assessments within the same course. The findings showed that formative assessment influenced students' motivation to learn and made them aware of what they had learned. In other words, formative assessment can influence both the process and outcomes of learning. This idea has formulated the argument of setting formative assessment tasks in a project learning context as it can maximize the benefits.

As reported by Carless (2005), Sue Wong, a preservice primary school teacher, had applied formative assessment in teaching mathematics to primary six school students, in teaching "categorization skills." She introduced a miniproject as coursework to engage students in completing a succession of cooperative learning tasks. Wong had provided students with a feedback sheet, informing the strengths and weaknesses of their performance against a set of predefined assessment criteria. Students were given opportunities to make corrections and resubmit their work to the teacher for consolidating their own work.

Another example was the extensive use of formative assessment strategies in the design of project learning for teaching English composition for primary two students (Lam, 2011b). Miss Pang built series of activities into a project around the theme "endangered animal." First, students were told a real story about the dodos of Mauritius, for reasons that these birds became endangered because they were caught for food by Europeans who migrated and settled in Mauritius. This leads to an exploratory stage in which students learned some other endangered animals through doing worksheets and exercises, and they were also provided with Web sites where they could navigate information about endangered animals. As students were guided to learn through a series of project learning tasks, they acquired useful research skills which can help them investigate into an endangered animal of their own choice.

They were involved in group discussions and individual comprehension tasks and were also taught to use mind-map and tabulated text structure to organize information in a standard structure to proceed with writing about the details of the animal they selected. At the end, students had to complete writing a short composition on a selected endangered animal based on a set of requirement in the forms of a guideline. The project learning exercises were marked by teachers and then returned to students timely at different stages during the course of learning in the project. The end-of-project task was peer- and self-assessed upon a rubric which was a simplified version of the teacher's marking scheme. Each student in the class was required to make a presentation of two minutes to introduce one's own

endangered animal to the whole class, while their self-assessment report was submitted to the teacher together with their written composition. A booklet was used through the project study period, and it comprises the evidence of learning for students as a reflective learning record. The exercises in the project have served as an important form of learning for students. The continuous feedback from teachers and peer was enabled through the formative exercises introduced by the teachers in class. The formative feedback given to students ensure that their learning problems can be diagnosed, and the requirement to follow up the comments gained in the learning process help students to self-regulate their learning, this eventually helps students to make advancement in their project.

Miss Pang's design of a full range of formative assessment tasks in the project has proved to be very effective as a school-based project. At the university level, Orsmond, Reiling, and Reiling (2002) also paired first-year undergraduate biology students in a poster assignment and conducted self- and peer assessment. The contents of the assignment were scheduled to be completed in several stages: Students were involved in various stages of peer assessment exercise, and at the same time that they were allowed to make self corrections before submitting the final assignment. The formative assessment strategies used by the teacher suggested some very positive results, notably on students. They suggested that they learned from the peer-reviewed comments of their peers, and found peer support a valuable experience in the course.

As a whole, one cannot learn to orchestrate formative assessment by only learning the format. The practice of formative assessment implicates the demand of the professional knowledge of curriculum design and learner-centered teaching methods of teachers, who are able to pay attention to the all-round development of individuals, so that they can provide an environment to support the development of problem-solving skills and other traits that support students to be competent learners in the twenty-first century. They must be teachers who are sensitive to learners' needs and interests, those who are genuinely interested in learners and care about their well-being. As mentioned in the cases, Deirdra continuously assessed students' learning performances to discover students' strengths and weaknesses, and she cared about learner diversity, paying extra efforts to make the learning of low achievers possible by addressing their needs. Miss Wong and Miss Pang took the challenges by designing formative feedback strategies to develop students' cognitive strategies, and they adopted useful scaffolding activities which were interesting and fun to do for learners, leaving ample space for learners to maximize their potentialities. During the course of learning, students were exposed to an environment where support (via formative assessment strategies) was available, including frequent verbal and written feedback, from both the peers and teacher. These episodes also illustrate the fact that teachers who carried out formative assessment have actually had a high expectation on learners, and they devoted quality time to help them achieve it. The effect was that students not only achieved more favorable academic outcomes, their capabilities for learning were also enhanced. These substantial learning journeys demonstrate a coregulating process of learning for both teachers and learners (Butler, Schnellert, & Cartier, 2013).

16.5 The Way Forward

Nowadays, the global market emphasizes all-round talents. Traditional summative assessment places heavy emphasis on the achievement in academic performance, and it creates an unfavorable environment for students in developing themselves, resulting in incompetence and handicaps that deter proper development for youngsters in the pursuit of knowledge, personal interest, life goals, and the status of well-being (Lam, 2008; Pong & Chow, 2002). In this regard, formative assessment which promotes intrinsic motivation, metacognition, and self-regulated learning can be utilized as a meaningful pedagogical tool for teachers to re-establish the core value of education in helping learners to realize themselves through developing their talents, interests, and capabilities. The ultimate goal of formative assessment, same as the core aim of education, is to engage students in pursuing their own interest in study. In addition to enhancing one's study skills and achievement, it acts to make every student a resource of learning and strengthen the social support network of learning. By implementing formative assessment, individuals can benefit from their study in educationally meaningful ways. In fact, by involving themselves actively in giving comments to their peers and taking their peers' comments in improving their own work; students can be developed an attitude of seeking improvement and improved the working skills involved in this interaction; all of these are valuable to young people in the twenty-first century to fit the global market.

Teachers in Hong Kong may not be proactive to take a step forward in promoting formative assessment because of the practical constraints; some may hold the view that learners are shaped by numerous examinations, and hence, improvement occurs (Lam, 2011a–c; Dahlin & Watkins, 2000: Cheng, 1999). As a result, authentic research on assessment practice is in demand to provide the proof to those teachers in order to convince them to change their assessment approaches. With the idea of promoting independent learning, generic skills, and lifelong learning attitude as appeared in the curriculum policies worldwide, policy makers should continue to create opportunities of collaboration with educational developers to publicize the benefits of formative assessment, especially attending to cultivate the mind-sets of parents, teachers, principals, or even preservice teachers, and those who only see education as a technical one-size-fit-all training business. During Carless' research (2005), it was observed that "the teachers seemed to go through the stages of developing an understanding of assessment for learning, reconciling it with their prior beliefs and practices, experimenting with and reflecting on the new assessment practices" (p. 49) under the professional support of and collaboration with the research team. Sufficient resources are also essential to support the running of productive formative assessment. Formative assessment demands time of teachers in designing meaningful assessment practices and time of both teachers and students engaging into feedback and reflection.

Noteworthy that government or institutional policy has a significant impact on the implementation of formative assessment. A way to improve learners' personal development would be following the recommendation of formative assessment, i.e.,

"learning to learn" (Curriculum Development Council, 2001) to "reduce excessive tests, examinations and dictations" (p. iv) and "help to provide information for both students and teachers to improve learning and adjust teaching" (p. viii). Design of traditional examinations, which aims to gauge out learners' memorization, should be changed to accommodate the cultivation of a variety of generic skills development, such as higher-order thinking (e.g., critical thinking and creative thinking) that supports learners to build up the capacities of becoming independent, lifelong learners. Changes in the format of examination is obligatory as the twenty-first century requires multiple talents, higher-order thinking, application of knowledge, and creative problem solving. Reducing obsessive examination gives extra time for learners to learn with self-regulation during class and spare more room for teachers to prepare a class that guides students to be independent learner.

Specific to learners, formative assessment which demands cognitive skills such as listening, recalling, and comprehending, collaboration, and interaction may fit well into the characteristics of Chinese learners who display these qualities (Grimshawa, 2007; Dahlin & Watkins, 2000). Several studies on the cognitive strategies of Chinese learners reported that criticisms on the passivity and rote-learning model of Chinese learners should be reinterpreted. Grimshawa (2007), after reviewing the related literature over the past 10–20 years, argues that Chinese learners' cognitive-centered, listening-based approach can lead to as active engagement in learning as the more verbal approaches of Western students. Also, Leung, Ginns, and Kember's (2008) study showed that viewing Chinese students as rote and superficial learners is a misconception. They found that Chinese students displayed a range of intermediate approaches that combined surface and deep learning—that is, they used both memorization *and* understanding—in a similar way to the Australian learners in their sample. Dahlin and Watkins (2000) found that repetition in the process of memorizing can play an important role in improving understanding. Nevertheless, passive and rote learning may dominate if teachers want to "fast-track" in an examination-oriented culture by disenabling the expression of diverse viewpoints and creative thinking. Learners who receive formative assessment may need room to develop the knowledge to decode, translate, and hence cope with the feedback from teachers and peers, so that they can evaluate and select appropriate new strategies to raise their performances as they get closer to the goals or standards.

The productive implementation of formative assessment should be a long-term commitment for teachers that should not be expected to succeed in a glimpse of an eye. To promote SoLT, efforts committed to teaching innovations as well as the continued professional sharing among practitioners should be widely promoted in the education community. Hopefully that more teachers can gain the insights of using formative assessment in teaching, as the reward is undoubtedly worthy of the efforts made in improving students' learning.

References

Black, P., & Wiliam, D. (1998). *Inside the black box: Raising standards through classroom assessment*. London: Granada Learning.

Black, P., & Wiliam, D. (2003). 'In praise of educational research': Formative assessment. *British Educational Research Journal, 29*(5), 623–637.

Black, P., & Wiliam, D. (2004). The formative purpose: Assessment must first promote learning. *Yearbook of the National Society for the Study of Education, 103*(2), 20–50.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability (formerly: Journal of Personnel Evaluation in Education), 21*(1), 5–31.

Boekaerts, M., Maes, S., & Karoly, P. (2005). Self-regulation across domains of applied psychology: Is there an emerging consensus? *Applied Psychology, 54*(2), 149–154.

Brookhart, S. M. (1997). A theoretical framework for the role of classroom assessment in motivating student effort and achievement. *Applied Measurement in Education, 10*(2), 161–180.

Buczynski, S. (2009). Formative feedback stimulates students' thinking and provides teachers with information to guide future instruction. *Tips for Providing Formative Feedback, 10,* 1–2.

Butler, D. L., Schnellert, L., & Cartier, S. C. (2013). Layers of self- and co-regulation: Teachers working collaboratively to support adolescents' self-regulated learning through reading. *Education Research International,* 1–19.

Cantor, N. (1990). From thought to behaviour: "Having" and "doing" in the study of personality and cognition. *American Psychologist, 45,* 735–750.

Carless, D. (2005). Prospects for the implementation of assessment for learning. *Assessment in Education: Principles, Policy & Practice, 12*(1), 39–54.

Carless, D. (2012). *From testing to productive student learning: Implementing formative assessment in confucian-heritage settings*. New York, NY: Routledge.

Cauley, K. M., & McMillan, J. H. (2010). Formative assessment techniques to support student motivation and achievement. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(1), 1–6.

Cheng, L. Y. (1999). Changing assessment: Washback on teacher perceptions and actions. *Teaching and Teacher Education, 15*(3), 253–271.

Clarke, S. (1998). *Targeting assessment in the primary classroom: Strategies for planning, assessment, pupil feedback and target setting*. London: Hodder & Stoughton.

Cooper, N. J. (2000). Facilitating learning from formative feedback in level 3 assessment. *Assessment & Evaluation in Higher Education, 25*(3), 279–291.

Curriculum Development Council. (2001). *Learning to learn: The way forward in curriculum development*. Hong Kong: The Printing Department.

Dahlin, B., & Watkins, D. (2000). The role of repetition in the processes of memorizing and understanding: A comparison of the views of German and Chinese secondary school students in Hong Kong. *British Journal of Educational Psychology, 70,* 65–85.

Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.

Furlong, J. (2008). Making teaching a 21st century profession: Tony Blair's big prize. *Oxford Review of Education, 34*(6), 727–739.

Grimshawa, T. (2007). Problematizing the construct of 'the Chinese learner': Insights from ethnographic research. *Educational Studies, 33*(3), 299–311.

Hacker, D. J., Dunlosky, J., & Graesser, A. C. (Eds.). (1998). *Metacognition in educational theory and practice*. New York, NY: Routledge.

Harlen, W., & Deakin Crick, R. (2003). Testing and motivation for learning. *Assessment in Education: Principles, Policy & Practice, 10*(2), 169–207.

Henson, K. T. (2015). *Curriculum planning: Integrating multiculturalism, constructivism, and education reform* (5th ed.). Long Grove, IL: Waveland Press.

Hodgen, J., & Webb, M. (2008). Questioning and dialogue. *Unlocking Assessment: Understanding for Reflection and Application*, *73*.

Hwang, G. J., & Chang, H. F. (2011). A formative assessment-based mobile learning approach to improving the learning attitudes and achievements of students. *Computers & Education, 56*(4), 1023–1031.

Juwah, C., Macfarlane-Dick, D., Matthew, B., Nicol, D., Ross, D., & Smith, B. (2004). *Enhancing student learning through effective formative feedback*. UK: The Higher Education Academy Generic Centre.

Labuhn, A. S., Zimmerman, B. J., & Hasselhorn, M. (2010). Enhancing students' self-regulation and mathematics performance: The influence of feedback and self-evaluative standards. *Metacognition and Learning, 5*(2), 173–194.

Lam, B. H. (2008). The issue of diversity in the Hong Kong school curriculum: Student communities in a mainstream school. *Schools: Studies in Education, 5*(1/2), 118–140.

Lam, B. H. (2011a). Constructivist perspectives of learning. In S. N. Phillipson & B. H. Lam (Eds.), *Learning and teaching in the Chinese classroom* (pp. 31–62). Hong Kong: HKU Press.

Lam, B. H. (2011b). Lesson planning, assessment and learning. In Phillipson & B. H. Lam (Eds.), *Learning and teaching in the Chinese classroom: Responding to individual differences* (pp. 265–290). Hong Kong: HKU Press.

Lam, B. H. (2011c). A reflective account of a pre-service teacher's effort to implement progressive curriculum in field practice. *Schools: Studies in Education, 8*(1), 22–39.

Leung, D. Y. P., Ginns, P., & Kember, D. (2008). Examining the cultural specificity of approaches to learning in universities in Hong Kong and Sydney. *Journal of Cross-Cultural Psychology, 39*(3), 251–266.

Mok, K. H., & Cheung, A. B. L. (2011). Global aspirations and strategising for world-class status: New form of politics in higher education governance in Hong Kong. *Journal of Higher Education Policy and Management, 33*(3), 231–251.

McCarthy, J. P., & Anderson, L. (2000). Active learning techniques versus traditional teaching styles: Two experiments from history and political science. *Innovative Higher Education, 24* (4), 279–294.

Means, B. (1994). *Introduction: Using technology to advance educational goals* (pp. 1–21). Technology and education reform: The reality behind the promise.

Musial, D., Nieminen, G., Thomas, J., & Burke, K. (2009). *Foundations of meaningful educational assessment*. Boston, MA: McGraw-Hill Higher Education.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199–218.

Orsmond, P., Merry, S., & Reiling, K. (2002). The use of exemplars and formative feedback when using student derived marking criteria in peer and self-assessment. *Assessment & Evaluation in Higher Education, 27*(4), 309–323.

Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning. *Theory into Practice, 41*(2), 116–225.

Pat-El, R., Tillema, H., & van Koppen, S. W. (2012). Effects of formative feedback on intrinsic motivation: Examining ethnic differences. *Learning and Individual Differences, 22*(4), 449–454.

Pintrich, P. R., & Zusho, A. (2002). Student motivation and self-regulated learning in the college classroom. In *Higher education: Handbook of theory and research* (pp. 55–128). Dordrecht, Netherlands: Springer.

Pong, W. Y., & Chow, J. C. S. (2002). On the pedagogy of examinations in Hong Kong. *Teaching and Teacher Education, 18*(2), 139–149.

Radloff, A. (2010). *Doing more for learning: Enhancing engagement and outcomes: Australasian survey of student engagement: Australasian student engagement report*. Camberwell, Victoria: Australian Council for Education Research.

Rolfe, I., & McPherson, J. (1995). Formative assessment: How am I doing? *The Lancet, 345* (8953), 837–839.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54–67.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119–144.

Sadler, D. R. (1998). Formative assessment: Revisiting the territory. *Assessment in Education, 5* (1), 77–84.

Sadler, D. R. (2010). Beyond feedback: Developing student capability in complex appraisal. *Assessment & Evaluation in Higher Education, 35*(5), 535–550.

Scriven, M. (1967). The methodology of evaluation (AERA) monograph series on curriculum evaluation, No. 1. Chicago: Rand McNally.

Shavelson, R. J., Young, D. B., Ayala, C. C., Brandon, P. R., Furtak, E. M., Ruiz-Primo, M. A., et al. (2008). On the impact of curriculum-embedded formative assessment on learning: A collaboration between curriculum and assessment developers. *Applied Measurement in Education, 21*(4), 295–314.

Stoeger, H., & Ziegler, A. (2008). Evaluation of a classroom based training to improve self-regulation in time management tasks during homework activities with fourth graders. *Metacognition and Learning, 3*(3), 207–230.

Taras, M. (2005). Assessment–summative and formative–some theoretical reflections. *British Journal of Educational Studies, 53*(4), 466–478.

University Grants Council. (2010). *Aspirations for the higher education system in Hong Kong*. Report of the University Grants Committee.

Vygotsky, L. S. (1978). *Mind in society: The development of higher mental [or psychological?] processes*. Cambridge, MA: Harvard University Press.

Weurlander, M., Söderberg, M., Scheja, M., Hult, H., & Wernerson, A. (2012). Exploring formative assessment as a tool for learning: Students' experiences of different methods of formative assessment. *Assessment & Evaluation in Higher Education, 37*(6), 747–760.

Wingate, U. (2010). The impact of formative feedback on the development of academic writing. *Assessment & Evaluation in Higher Education*, *35*[or 34?](5), 519–533.

Yang, M., & Carless, D. (2013). The feedback triangle and the enhancement of dialogic feedback processes. *Teaching in Higher Education*, iFirst, 1–14.

Yorke, M. (2003). Formative assessment in higher education: Moves towards theory and the enhancement of pedagogic practice. *Higher Education, 45*(4), 477–501.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*(2), 64–70.