

【School Education Reform Series】

The Practice of
Assessment for Learning
and Metacognitive Teaching
in Hong Kong Classrooms

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School Education Reform Series

School education has become one of the most essential institutions in modern society. Tremendous resources have been invested in schools. Most modern societies have made it compulsory for their young people to spend a lengthy period of time in education. The effectiveness and efficiency of school education have been viewed as the necessary conditions for the development and prosperity of all modern societies. With the development of global economy and the emergence of the information age, all societies are under pressure to improve or even reform their school education system, if they are to enhance, or at least to maintain, their competitiveness in the ever-changing world economy.

How should Hong Kong equip its new generation to meet the challenges of the 21st century? School education reform is certainly one of the key issues in this matter. Which direction should our school reform take? What school reform programs should we adopt? How should we summarize and evaluate the existing school reform programs? How should we share, disseminate and promote those school reform programs that have been proven effective?

To address these issues, the Hong Kong Institute of Educational Research publishes the School Education Reform Series. It aims to provide local educators with a forum to exchange their ideas and experiences on the matter. To these ends, this series will publish research results, program designs, summaries of practices and experiences, and evaluative reports pertaining to school reforms in Hong Kong.

The Practice of Assessment for Learning and Metacognitive Teaching in Hong Kong Classrooms

Abstract

This paper first explores the concepts of assessment for learning and metacognition, their importance in learning and teaching, and their relationship with each other. Through class observation, the authors conducted a study to examine the practice of assessment for learning and metacognitive teaching by Hong Kong teachers. Findings show that teachers' awareness and competences in both areas were fairly weak. It is recommended that more professional development programs for practicing teachers and training courses for student teachers about these areas should be provided, if the core aim of "learning to learn" advocated in the recent education reform is to be achieved effectively.

Background

In the 20th century, the world is facing tremendous challenges posed by the rapid development of information technology and the substantial changes in economic structure where most countries have shifted from large-scale manufacturing to high-technology industries and value-added services. It is believed that those who do not know how to learn are hard to survive in the 21st century because the vast majority of jobs nowadays need employees with intermediate or advanced skills rather than unskillful workers with only basic literacy skills.

Like the cases in many other advanced countries, the Hong Kong government considers the ability of “learning to learn” as the asset for success and the crucial element in achieving excellence. As Holt (1964), a famous educator, has pointed out:

... since we can't know what knowledge will be most needed in the future, it is senseless to try to teach it in advance. Instead, we should try to turn out people who love learning so much and learn so well that they will be able to learn whatever needs to be learned. (p. 176)

Education Reform in Hong Kong

After a comprehensive review of the education system in Hong Kong, the Education Commission (2000) finds that in spite of the huge resources invested in education, the learning effectiveness of students is far from desirable — learning is still examination-oriented, boring, and monotonous. Little attention is paid to the ability of “learning to learn.” Students are not given sufficient opportunities to think, explore, create, and be responsible for their own learning. This inhibits them from self-learning. In order to address these inadequacies, the Education Commission recommended a reform for the education system in Hong Kong in September 2000. The scope of the reform covers the curricula, the academic structure, the assessment mechanisms, and the admission systems for different stages of education and “lifelong learning and all round development” are the expected outcomes of the reform. As the Curriculum Development Council (2001) states:

To cope with the challenges of the 21st Century, education in Hong Kong must keep abreast of the global trends and students have to empower themselves to learn beyond the confines of the classroom. The school curriculum, apart from helping students to acquire the necessary knowledge, should also help the younger generation to develop a global outlook, to learn how to learn and to master life-long skills that can be used outside schools. The curriculum should also cultivate students' positive values and attitudes to achieve the educational aims of promoting whole-person development and life-long learning. (1st paragraph of "A Message from the Chairman")

The government has recognized the narrowing effect of learning caused by the heavy emphasis on tests and examinations that are predominantly in written form. Under this constraint, school education has tended to put too much stress on the products of learning (e.g., memory, understanding of knowledge and concepts) and failed to reflect students' independent learning capabilities and other learning experiences in the learning process. In view of the deficiency of the assessment practice in Hong Kong schools, "Assessment for Learning" (AFL) was recommended as one of the key areas of action for enhancing students' independent learning capabilities in the education reform:

As part of the curriculum, the major function of assessment is help teachers and parents understand the learning, progress and needs of their students, as well as their strengths and weaknesses. Teachers could take into account the results of assessment in planning the teaching syllabus, designing teaching methods and giving guidance to individual students to help them learn effectively and exploit their potentiality fully.

This will also enable students to have a deeper understanding of themselves. (Education Commission, 2000, p. 46, para. 7.12)

In order to promote the AFL culture at the school level, teachers are encouraged to conduct multiple modes of assessments to assess both the learning processes (e.g., inquiring, independent learning, use of generic skills, reflections) and products (e.g., knowledge/concepts, problem-solving capacities) according to different purposes (e.g., oral tests for oral communication, discussion for collaboration, presentation for organization, written tests and examinations for knowledge) “at various stages of basic education ... as and when appropriate to get a better picture of students’ progress in learning and to identify their strengths and weaknesses at an early stage, so that follow-up actions can be taken as soon as possible and suitable assistance given to students with learning problems” (Education Commission, 2000, p. 46, para. 7.13).

AOL vs. AFL

As mentioned above, in order to help students become lifelong learners, the Curriculum Development Council (2001) has recommended that schools should shift their assessment focus from AOL (Assessment of Learning) to AFL, in which teachers identify and diagnose their students’ learning problems, and provide quality feedback for improving their work.

Throughout the past century, the concept of AOL has been used in most school assessment practices in Hong Kong. In general, AOL is:

summative in nature and is used to confirm what students know and can do, to demonstrate whether they have achieved the curriculum outcomes, and, occasionally, to show how they are placed in relation to others. (Manitoba Education, Citizenship and Youth, 2006, p. 14)

Furthermore, summative assessments are usually given after learning occurs. Teachers concentrate on ensuring that they have used assessment to provide accurate and sound statements of students' academic proficiency, so that the recipients of the information (school, school districts, and the government) can use the information to make reasonable and defensible decisions about the effectiveness of the curriculum used, the goals of professional development, and budgetary needs. Also, students and parents can use the information to make personal decisions and set personal goals (Iowa Department of Education, 2008; Manitoba Education, Citizenship and Youth, 2006).

However, this traditional approach of assessment has been challenged and replaced by the approach of AFL because the expectation for education from society has changed from ensuring the younger generation to possess basic skills and knowledge to helping them become competent in critical thinking, problem solving, and effective communication in order to cope with the economic and technological changes in society (Manitoba Education, Citizenship and Youth, 2006).

The AFL concept is underpinned by the beliefs that each student is unique and possesses multiple intelligences, different potentials, and the ability to learn. Their motivation in learning

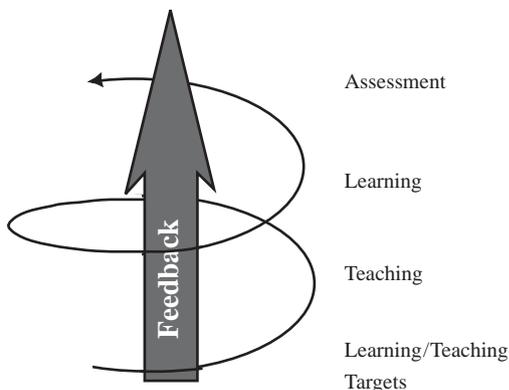
will be enhanced when they are given opportunities to experience progress and success through the adoption of formative assessment practices (see Table 1). To promote better learning, schools are encouraged to put more emphasis on AFL as an integral part of the learning, teaching, and assessment cycle (see Figure 1). This means that the curriculum is responsible for setting out what students should learn in terms of learning targets or objectives while the assessment serves as a means to collect evidence of student learning by assessing both the learning product (i.e., the learning targets and content that students are expected to achieve) and the learning processes (i.e., how they learn). Thus, teachers can use the information collected by the assessment practice as the basis for decisions on improving learning and teaching, and informing students

Table 1. Summative Assessment vs. Formative Assessment

Summative Assessment	Formative Assessment
<ul style="list-style-type: none"> • Refers to the evaluation of students' performance and attainment at the conclusion of a significant period of instruction (e.g., end of a term, end of an academic year) • Is usually carried out in the form of tests or examinations • Involves reviewing a much larger "chunk" of learning 	<ul style="list-style-type: none"> • Refers to the on-going evaluation of students' performance and progress to determine how well the learning and teaching is being done • Is carried out as part of the daily learning and teaching process, through observing students' work or performance • Involves teachers' choice to assess one or two learning targets and objectives to explore students' strengths and weaknesses and give appropriate and quality feedback

Source: Education Bureau (2008, p. 13).

Figure 1. Learning, Teaching, and Assessment Cycle



Source: Adapted from the Curriculum Development Institute (2002).

about their strengths and weaknesses. At the same time, students' motivation and interest of learning will be reinforced with teachers' recognition of their achievements and provision of necessary steps to improvement (Assessment Reform Group, 1999; Curriculum Development Council, 2001; Curriculum Development Institute, 2002).

The Assessment Reform Group (1999, p. 4) has identified five crucial factors of improving learning through assessment:

- provision of effective feedback to students;
- active involvement of students in their own learning;
- adjustment of teaching after taking account of assessment results;
- recognition of the profound influence of assessment on students' motivation and self-esteem;
- the need for students to assess themselves and understand how to improve.

This implies that teachers should share the learning goals or assessment criteria with students at the beginning of each lesson. This gives students an understanding of the standards for which they should aim, thus enabling them to evaluate their own learning (i.e., through peer or self-assessment) as well as enhancing their ownership of learning. With teachers' timely and quality feedback, the comments from their fellow classmates as well as self-evaluation, students recognize their strengths and weaknesses. Not only will their motivation and self-esteem be heightened because of the recognition of their own achievement and progress of learning, the way to improve learning will also be known to them by making use of the feedback and suggestions from their teachers and peers.

Similar to the opinion of the Assessment Reform Group (1999), the Qualifications and Curriculum Authority (2008, para. 2) suggests that AFL should include:

- sharing learning goals with pupils
- helping pupils know and recognise the standards to aim for
- providing feedback that helps pupils to identify how to improve
- believing that every pupil can improve in comparison with previous achievements
- both the teacher and pupils reviewing and reflecting on pupils' performance and progress
- pupils learning self-assessment techniques to discover areas they need to improve
- recognising that both motivation and self-esteem, crucial for effective learning and progress, can be increased by effective assessment techniques

Hence, in order to enhance AFL in classrooms, teachers need to: (a) share their learning goals with their students at the beginning of the lesson; (b) utilize effective questioning techniques to tap students' understanding; (c) use effective feedback strategies; (d) encourage peer and self-assessment to enable students to recognize their strengths and weaknesses for improving their own learning.

Sharing Learning Goals or Objectives

At the beginning of the lesson, teachers should state clearly the learning objectives and ensure that students recognize the difference between the task (what they have to do) and its learning intention (what they will learn). In order to involve students fully in their learning, teachers should explain clearly the reasons for the lesson or activity in terms of the learning objectives. In an assessment task, teachers should share the assessment criteria with students to help them understand what they have done well and what they need to develop, thus facilitating peer and self-assessment after the task (Qualifications and Curriculum Authority, 2008).

Effective Questioning Techniques

In daily classroom teaching, closed-ended questions are normally used by teachers to check students' knowledge and comprehension. The answers for these questions are usually short, direct, and uncomplicated. They fail to provide teachers with effective assessment opportunities to make judgment on the following aspects for improving the learning/teaching process:

- the thought processes students need to go through in arriving the answers;
- what students know, understand, and can do with their learning;
- students' specific misconceptions during the learning process.

Hence, in order to enhance AFL, teachers need to use open-ended questions (i.e., Wh-questions) which not only require students to apply, analyze, synthesize, or evaluate their knowledge that they have learned, but also help to reveal students' thinking processes and understanding so that teachers can make use of this evidence to target their teaching (Curriculum Development Institute, 2004; Qualifications and Curriculum Authority, 2008).

According to the Curriculum Development Institute (2004), most teachers do not give sufficient time for students to process the question and formulate an answer after posing a question to them. They tend to wait for one or two seconds only, and then turn to another student or answer the question by themselves, thus discouraging students to think or even inhibiting them from giving responses to the question. Hence, teachers need to allow enough wait-time for students to respond, especially when the questions require students' high-order thinking. Also, teachers can use cues, prompts, and probes to help students understand the questions or stimulate them to think thoroughly before giving their answers.

Quality Feedback

Feedback is considered to be most effective when it confirms

that students are on the right track and when it stimulates correction or improvement of students' work or performance.

According to the Curriculum Development Institute (2004, Facilitator's Guide, pp. 85–86), quality feedback exhibits the following characteristics:

- *Diagnostic and corrective* — Feedback should be diagnostic so that students can understand their strengths and weaknesses. It should be corrective so that students know which specific areas for making plans for further improvement.
- *Clear and easy to understand* — Teachers should give their feedback to their students in a way which is clear and easy to understand.
- *Positive* — Teachers should avoid putting too much emphasis on marks or grades, or comparing students with each other as this will undermine students' effort on the task or lower their self-esteem. In handling students' incorrect answers, teachers can use cues, prompts, or probes to help them arrive the correct answers instead of telling them that their answers are wrong.
- *Related to learning objectives* — Quality feedback should be related to the learning objectives or success criteria of the task. Therefore, teachers should refrain from giving distracting feedback on other aspects which are not the focus of learning.
- *Timely* — Feedback should be given at the right time. It is not advisable for teachers to interrupt students' presentation or student-student interaction since it will undermine students' self-esteem or distract the flow of interaction.

- *Practical and achievable* — Suggestions given by teachers should be practical and achievable so that students can strive for success.

Instead of providing complete solutions to students as soon as they get stuck, teachers' prompts, probes, or suggestions for improvement should act as "scaffolding" — that is, students should be given as much help as they need to use their knowledge. Also, a culture of success should be advocated in which each student can make achievements by building on their previous performance rather than being compared with others. This can be achieved by discussing with students about their strengths and weaknesses demonstrated in their work and giving them practical and feasible suggestions for further improvement (Qualifications and Curriculum Authority, 2008).

Peer and Self-Assessment

Encouraging students to reflect on their own work can enhance learning. Once students understand how to assess their current knowledge and the gaps in it, they will have a clearer idea of how they can improve their learning. Thus, the major role of teachers is to offer assistance to students where necessary. Moreover, they should provide students with opportunities for self-reflection and make sure that the latter are supported to admit their difficulties or weaknesses in learning without risk to their self-esteem. Most importantly, students should be given sufficient time to make improvement based on the quality feedback given by their teachers.

In addition, encouraging students to comment on their fellow classmates' work is essential in learning since they can understand both the learning objectives and the task requirement (or assessment criteria) while evaluating others' work. Moreover, looking at different answers or responses can help students understand the alternative methods for the task. However, peer assessment must be conducted with caution. Students must understand that the purpose of peer assessment is solely for self-improvement rather than competing with one another. Otherwise, those performing better than others will be challenged and those performing worse will be demotivated (Qualifications and Curriculum Authority, 2008).

In this section, the importance of AFL in education reform has been discussed. In the following section, we will focus on "metacognition," which is considered to be another essential element regarding learning and teaching (Pang & Lee, 2006).

Metacognition

For the last couples of decades, "metacognition" has become one of the popular issues in educational psychology because it is widely believed that it has important applications in learning (Flavell, 1985). According to Fisher (1998), a "meta" was a conical column set in the ground at each end of the Roman Circus to mark the turning point in a race in Ancient Rome (p. 1). Thus, "metacognition" can be interpreted as a turning point in our understanding of the mind. "Meta" is also a prefix which refers to something that transcends the subject it is related

to. Metacognition can be seen as a higher level of thinking that involves active control over the cognitive process in learning situations.

“Metacognition” was first coined by Flavell (1979) which refers to “any knowledge or cognitive activity that takes as its object, or regulates, any aspect of any cognitive enterprise” (Flavell, 1985, p. 104). In other words, metacognition is the individuals’ own awareness and consideration of their cognitive processes and strategies. It is the ability “to be self-reflexive, not just to think and know but to think about their own thinking and knowing” (Fisher, 1998, p. 1).

Flavell’s Definition of Metacognition

According to Flavell (1985), metacognition can be divided into two components: metacognitive knowledge and metacognitive experiences. Metacognitive experiences involve the use of metacognitive strategies or metacognitive regulation (Brown, 1987).

Metacognitive knowledge refers to what individuals know about themselves and others as cognitive processors. It can be roughly subdivided into knowledge of person variables, task variables, and strategy variables (Flavell, 1985). Knowledge of person variables refers to the general knowledge about how people learn and process information, as well as individual’s knowledge of one’s own learning processes. For instance, most people are aware that they may be more concentrated in their study if they work in the library rather than at home where

there are many distractions. Knowledge of task variables is the knowledge about the nature and requirement of the task that will place upon the learner. For example, people may be aware that it will take more time for them to read an academic journal article than a cartoon. Finally, knowledge about strategy variables refers to the knowledge about both cognitive (e.g., note-taking, scanning, inferring, etc.) and metacognitive strategies (e.g., self-questioning, self-monitoring, predicting, etc.) as well as the conditional knowledge about when and where it is appropriate to use such strategies (Livingston, 1997; Pang & Lee, 2006).

Metacognitive experiences refer to conscious experiences (ideas, thoughts, feelings, sensation) connected with a cognitive activity. They can be brief or lengthy, simple or complex in content, and they may take place at any time before, during, or after the cognitive endeavor. Metacognitive experiences are usually associated with the concepts of individuals about where they are in a cognitive activity and what sort of progress they are making, they have made, or they are likely to make. They normally take place in learning tasks which require the careful, conscious monitoring and regulation of individuals of their own cognitive activities. Additionally, metacognitive experiences may trigger further metacognitive strategies during the ongoing activities. For example, an individual's sudden recognition that he or she cannot comprehend what he or she has just been reading may lead to subsequent adaptive actions: re-reading the passage, rethinking what has already been understood, reading ahead for further clarifications, and asking someone's assistance (Flavell, 1985).

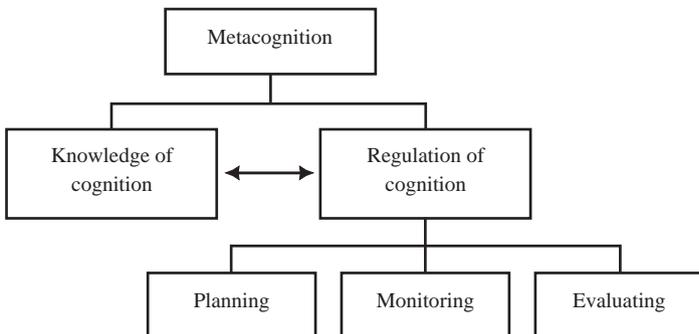
Metacognitive knowledge and metacognitive experiences are often informing and eliciting one another during the cognitive activity. Moreover, metacognitive experiences can add to, delete, or revise metacognitive knowledge and thus play an important role in the latter's development (Flavell, 1981, 1985).

Brown's Conceptualization of Metacognition

According to Brown (1987), Baker and Brown (1984), and Brown and Palincsar (1982), metacognition refers to the knowledge of cognition and regulation or control of cognition (see Figure 2). They are feeding on one another recursively.

Knowledge of cognition refers to the relatively stable, storable, often fallible, and late-developing information that human thinkers have about their own cognitive operations and reflection about those of others. It is a form of declarative knowledge about the domain "thinking." This form of knowledge is comparatively stable because one would expect the thinker

Figure 2. Brown's (1987) Model of Metacognition



who knows pertinent facts (i.e., that organized material is easier to learn than disorganized material, and that texts contain familiar words and concepts are easier to comprehend than those contain unfamiliar words) will continue to know these facts. This kind of knowledge is also stable since learners can reflect on the cognitive processes involved and discuss them with others. It is often fallible because learners may know certain facts about cognition that are not true. Lastly, it is assumed to be late-developing as it requires learners to step back and consider their own thinking processes as objects of thought and reflection (Brown & Palincsar, 1982).

Regulation of cognition includes planning activities before undertaking a problem (e.g., predicting outcomes, scheduling strategies) and monitoring activities (e.g., monitoring, testing, revising one's learning strategies) during learning and checking outcomes (e.g., evaluating the outcomes of any strategic actions against criteria of efficiency and effectiveness). It has been assumed that these skills are somewhat unstable, unstable, and relatively age-independent (Brown & Palincsar, 1982). According to Baker and Brown (1984), these skills are not necessarily stable skills although they are more often used by older children and adults. Besides older children and adults, some young children may also use these skills to monitor their own activities on a simple problem. Moreover, regulation of cognition appears to be age-independent since learners of any age tend to take active control over their own cognitive processes when they are faced with tasks of intermediate difficulty (because if the task is too easy, they need not bother; if the task is too difficult, they give up).

In this section, Flavell's (1985) and Brown's (1987) conceptualization of metacognition are briefly reviewed. In the next section, some metacognitive teaching skills and techniques will be further explained.

Metacognitive Teaching Skills and Techniques

In developing students' metacognition, the following teaching skills and techniques can be used in everyday classroom context.

Think Aloud

In this technique, students are asked to say out loud what they are thinking about when performing the learning task or responding to questions posed by teachers or fellow classmates. Through this process, the complex thinking processes on how to tackle a problem or a cognitively demanding task can be revealed (Pang & Lee, 2006).

K-W-L Method

In this skill, students' prior knowledge is activated by being asked what they have **K**nown about a topic or reading text. Next, students are asked to set goals specifying what they **W**ant to learn (either individually or in a small group). After the learning process (or reading), they are required to reflect (or discuss on a group basis) what they have **L**earned. In this way, students can apply high-order thinking strategies which help them construct meaning from what they learned and monitor their progress toward their goals (North Central Regional Educational Laboratory, 2004; Ogle, 1986).

Q-P-N-P Technique

Pang and Lee (2006) summarized the work of Rose and Nicholl (1997) and advocated that teachers should follow a four-step Q-P-N-P strategy when posing questions to their students. After posing a **Q**uestion, teachers should **P**ause for 3 to 5 seconds (i.e., wait-time) to allow all students (even the less able ones) to have sufficient time to think about the question. Then, teachers can **N**ame a student to respond to the question. **P**raises or encouragement should be given if the student answers the question correctly.

Self-questioning Technique

Self-questioning technique is one of the effective ways in promoting self-directed learning, particularly in reading comprehension. Using the title, the first sentence and the pictures of a text, students generate their own questions regarding the text. They ask questions before they start to read and then stop at different sections of the text to answer their questions and ask new ones (Education Development Center, 2008; Hartman, 2006).

Reciprocal Teaching

It is an interactive method with the goal of understanding and remembering the content of a text through the use of student/teacher collaboration. This teaching strategy includes four study activities, namely summarizing, questioning, clarifying, and predicting. In this strategy, teachers and students take turns to lead discussion regarding sections of text. Reciprocal teaching not only improves reading comprehension but also provides

chances for students to learn to monitor their own learning and thinking (Palincsar & Brown, 1984; Wray, 2005).

Error Analysis

The error analysis procedure is a technique for converting mistakes to mastery. It provides an opportunity for students to self-identify or reflect on their own errors and seek improvement. By analyzing their own errors, students can self-correct the mistakes and understand how they will prevent similar ones in the future (Marzano, 2000).

Mind- or Concept-mapping

Mind-mapping or concept-mapping requires learners to write down a central idea/concept and think up new and related ideas/concepts which radiate out from the center. By focusing on the major ideas/concepts written down in their own words, and then looking for branches and connections between them, learners are actually mapping knowledge in a manner which will help them understand and remember new information (James Cook University, 2007).

Self-regulated Learning (SRL)

In developing students to be self-directed learners, teachers can enhance students' awareness and control over learning by teaching them to reflect before, during, and after their work/performance through effective planning, monitoring, and evaluating. For planning, students are encouraged to plan about what is to be done in the task, when to do each step, and how it is to be done. It is also important to invite students to explore alternative strategies and explain why a particular method is

chosen. For monitoring, students are required to check up on progress to determine how well they comprehend the task, whether they are heading to the desired goals, and whether they have forgotten anything important while they are proceeding the task (Hartman, 2006). For evaluating, students are asked to evaluate the outcomes of any strategic actions taken against criteria of efficiency and effectiveness after completing the task (Brown & Palincsar, 1982).

In this section, some specific metacognitive teaching and learning skills and techniques have been reviewed. In the following section, the relationship between metacognition and AFL will be explored.

Relationship between AFL and Metacognition

As discussed above, metacognition is an essential aspect in learning. The importance of metacognitive knowledge in determining achievement includes the knowledge of learning, the knowledge of learners' own learning strengths and weaknesses, and the demands of the current learning task. Metacognition also involves regulation of the thinking process, that is, planning before the learning task, monitoring success, and correcting errors when appropriate, and reflecting on or evaluating one's own performance. However, if learners lack insight into their own learning abilities, they are less likely to plan or self-regulate efficiently (Bransford, Brown, & Cocking, 1999, p. 85). Thus, allowing learners to conceptualize their strengths and weaknesses in the learning process becomes crucial in developing their metacognitive knowledge. This can be achieved by the AFL process discussed above — that is,

sharing the teaching objectives or the requirement (e.g., success criteria) of the learning activities with students; giving students ample time for evaluating their own performance or that of fellow classmates (i.e., self-assessment and peer assessment); and providing quality feedback to students after the learning tasks.

It is interesting to note that when comparing AFL and metacognitive teaching skills, some specific questioning techniques are identified in both areas, such as utilizing open-ended questions; using cues, prompts, and probes; providing sufficient wait-time to initiate students' high-order thinking; and allowing students to think thoroughly before responding to questions (see Table 2 below). This leads to the belief that the two constructs are somehow closely related to or supplemented with each other.

Table 2. Comparison Between AFL and Metacognition Teaching Skills

AFL	Metacognition
<ul style="list-style-type: none"> • Questions that stimulate high-order thinking • Use of Q-P-N-P technique • Using probes, prompts, and cues 	<ul style="list-style-type: none"> • Encouraging students to use think aloud
<ul style="list-style-type: none"> • Demonstrating self-assessment 	<ul style="list-style-type: none"> • Encouraging students' SRL
<ul style="list-style-type: none"> • Demonstrating peer assessment 	<ul style="list-style-type: none"> • Encouraging students to use self-questioning
<ul style="list-style-type: none"> • Informing teaching objectives of task(s) 	<ul style="list-style-type: none"> • Encouraging students to use mind- or concept-mapping
<ul style="list-style-type: none"> • Informing success criteria of task(s) 	<ul style="list-style-type: none"> • Demonstrating error analysis • Using K-W-L method • Using reciprocal teaching

Since both AFL and metacognition are important components in learning and teaching, it is worthwhile to examine teachers' practice in adopting AFL and metacognitive teaching strategies in everyday classroom. This study aims at exploring teachers' habit in using AFL and metacognitive skills and techniques in Hong Kong schools. The sample was from a group of 9 primary schools and 9 secondary schools which had participated in a school development project "Metacognition in Learning and Teaching: Supporting Students' Learning Needs." This two-year school development project was sponsored by the Quality Education Fund from 2006 to 2008, and was organized by the School Development and Evaluation Team (SDET) of The Chinese University of Hong Kong. Out of the 18 schools, only 5 primary schools and 8 secondary schools joined the research study. During the study process, two School Development Officers (SDOs) from the SDET visited each participating school and conducted class observations for three different lessons (single or double sessions). Before the visit by SDOs, the school principal of each participating school was required to select three lessons and inform the teachers that would be observed. However, neither the principals nor the teachers had been informed about the criteria of the class observations.

Data Collection

The participants were 39 teachers from 13 schools in Hong Kong. During the research study, two SDOs were assigned to conduct the class observations ($N = 78$) together in each

school. They were asked to observe whether the teachers had used any AFL skills and metacognitive teaching strategies in the lessons being observed. Both the SDOs were required to fill in a checklist during their observations to record the extent that teachers used such skills and strategies.

Findings

With respect to the 78 observations made by the two SDOs in 39 lessons from November 2007 to January 2008, the percentages of using AFL and metacognitive teaching strategies were recorded in Tables 3 and 4 respectively.

With respect to AFL, the most popular teaching strategies used are “Questions that stimulate high-order thinking,” “Using Q-P-N-P technique,” “Using probes, prompts, and cues,” and “Quality feedback,” whereas “Demonstrating peer assessment,” “Informing teaching objectives,” “Informing success criteria,” and particularly “Demonstrating self-assessment” are the four weakest parts that need most attention and improvement.

With reference to the assessment cycle (see Figure 1 above), the data seems to show that AFL hardly happened in these classrooms as the majority of teachers failed to recognize the importance of sharing the teaching objectives/targets with students, or they themselves did not have clear teaching targets when planning the lessons beforehand; and they were unable to make use of the information collected by the assessment tools to give quality feedback to students so that their strengths could be reinforced and at the same time their weaknesses could be improved.

Table 3. AFL Teaching Skills Used by Teachers ($N = 78$)

AFL teaching skills	Frequency of usage	Ranking
Questions that stimulate high-order thinking*	80.6%	1
Using Q-P-N-P technique*	73.1%	2
Using probes, prompts, and cues*	73.1%	2
Quality feedback*	65.7%	4
Demonstrating peer assessment	43.3%	5
Informing teaching objectives of task(s)	12.8%	6
Informing success criteria of task(s)	12.8%	6
Demonstrating self-assessment	0.0%	8

* indicates skills or techniques used at least 3 times per class observation.

Table 4. Metacognitive Teaching Skills Used by Teachers ($N = 78$)

Metacognitive teaching skills	Frequency of usage	Ranking
Questions that stimulate high-order thinking*	80.6%	1
Using Q-P-N-P technique*	73.1%	2
Using probes, prompts, and cues*	73.1%	2
Encouraging students to use think aloud	38.8%	4
Encouraging students' SRL	38.8%	4
Encouraging students to use self-questioning	20.9%	6
Demonstrating error analysis	19.4%	7
Using K-W-L method	13.4%	8
Encouraging students to use mind- or concept-mapping	6.0%	9
Using reciprocal teaching	4.5%	10

* indicates skills or techniques used at least 3 times per class observation.

In terms of metacognitive teaching skills, the most frequently used teaching techniques were “Questions that stimulate high-order thinking,” “Using Q-P-N-P technique,” and “Using probes, prompts, and cues.” However, teaching strategies such as “Encouraging students to use self-questioning,”

“Demonstrating error analysis,” “Using K-W-L method,” “Encouraging students to use mind- or concept-mapping,” and “Using reciprocal teaching” were occasionally or rarely found in the observations.

Discussion

The above data shows that the majority of teachers were able to use open-ended questions to stimulate students’ high-order thinking so that students’ thinking process and understanding of the knowledge currently learned could be effectively revealed. Most of the teachers could also make use of cues, prompts, and probes to help students understand questions or stimulate them to think thoroughly before responding to the questions. This may be due to the fact that teachers were alerted to the skill in the SDET training workshops and felt more confident in modifying their existing questioning techniques to pose more high-order thinking questions. Nevertheless, there was still room for improvement. During the class observations, it was found that many teachers did not allow enough wait-time for students to respond after posing a question to them. For instance, some teachers tended to ask only the volunteers or bright students to respond immediately after posing the questions, or teachers answered the questions themselves after waiting for a short while (i.e., one or two seconds). It generally agrees with the literature that the majority of teachers often fail to provide ample opportunities for students to think or even inhibit them from giving responses to their questions (Curriculum Development Institute, 2004).

Although more than half of the teachers’ feedback were

dialogistic and corrective (in the sense that students understood their strengths and weaknesses from the comments made by their teachers and knew which specific areas for further improvement), about one-third of the teachers appeared to have difficulty in giving quality feedback. It may be due to teachers' unawareness of the importance of quality feedback in teaching and learning as they have been brought up by the traditional AOL culture in the past decades in Hong Kong. Also, owing to the large class size and the packed, examination-oriented curriculum, teachers are often pressed for time in giving adequate feedback (Ko, 2005).

The data of the present study also indicates that many teachers did not have a habit of sharing the teaching objectives with their students at the beginning of the class, thus making peer and self-assessment almost impossible at the end of the lesson. The result generally agrees with the literature that many students do not have a clear picture of the learning targets they mean to attain in each lesson (Black & Wiliam, 1998). Another interpretation is that teachers themselves may not have any systematic idea of lesson planning or overarching teaching targets. In addition, it seems that teachers do not have sufficient knowledge of AFL and thus fail to recognize the benefit of keeping their students informed about the teaching objectives in facilitating peer and self-assessment. Teachers may also perceive that students have difficulties in understanding the teaching objectives, and therefore determine not to share these with them. Regarding self-assessment, it is surprising to find that no teachers had ever asked their students to self-evaluate their own work or performance openly in class. The reason

may be that teachers were not used to the self-evaluating culture in AFL.

Similar to AFL teaching skills, the most frequently used metacognitive teaching skills in the study were the use of open-ended questions to tap students' high-order thinking, the use of Q-P-N-P questioning techniques, and the use of cues, prompts, and probes in assisting students to arrive the answers. As mentioned above, attention should be given to the length of the wait-time in order to encourage all students to participate in the thinking process. Moreover, it is worth noting that other specific metacognitive teaching strategies such as "think aloud," "SRL," "self-questioning," "error analysis," "K-W-L method," "mind- or concept-mapping," and "reciprocal teaching" were seldom found in the observations. One possible reason is that under the constraints of large class size and tight curriculum in Hong Kong, teachers tend to use one-way, didactic teaching, and this results in the undermining of metacognitive skills in daily classroom. Moreover, the impact of public examinations is likely to worsen the situation as students are used to rote-learning and ignore the importance of practicing metacognitive skills in class (Mok, Fan, & Pang, 2007). A second explanation is that teachers may not have experienced the metacognitive strategies throughout their education or teacher training, and therefore they are not equipped with the knowledge of teaching these metacognitive strategies to their students.

Conclusion

The present study explores teachers' use of AFL and

metacognitive teaching skills and techniques in Hong Kong school settings. While the study pioneered a small-scale class observation in 13 primary and secondary schools, more large-scale and in-depth studies are needed to consolidate the findings of this preliminary study. Nevertheless, the findings of this study have various implications for education. As the absence of shared teaching objectives is mainly due to teachers' unawareness of its importance in self-evaluation and peer assessment for developing metacognitive competence and enhancing AFL, school policymakers and teacher trainers should remind teachers with the notion that if students acquire an overview of what the lessons are targeting at, they will become more committed and more effective as learners. When students' own assessments (either peer or self-assessment) become a focus of discussion in class, this will further promote the reflection on one's own thinking which is believed to be essential in developing metacognitive competence and implementing AFL in the classroom.

As for developing students' metacognitive competence in the classroom, it would be essential to equip teachers with the knowledge of incorporating metacognitive teaching strategies in their lessons. This can be achieved by organizing professional development programs or training sessions for practicing teachers as well as by implementing metacognitive teaching strategies in the teacher training curriculum. In addition, through peer observations among teaching staff with the assistance of SDOs or other professionals, teachers' awareness of developing students' metacognitive competence will be enhanced to some extent.

Finally, we would like to summarize the importance of AFL and metacognition with a quotation from Black and Wiliam's (1998) work:

When anyone is trying to learn, feedback about the effort has three elements: recognition of the *desired goal*, evidence about *present position*, and some understanding of a *way to close the gap* between the two. All three must be understood to some degree by anyone before he or she can take action to improve learning. (3rd paragraph under "Self-assessment by pupils"; italics original)

With teachers' awareness of the importance of AFL and students' metacognitive competence, it is hoped that the younger generation will be better equipped as self-sustaining, lifelong learners in the near future.

References

- Assessment Reform Group. (1999). *Assessment for learning: Beyond the black box*. Cambridge: School of Education, University of Cambridge.
- Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 353–394). New York: Longman.
- Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 80(2), 139–148. Retrieved February 3, 2008, from <http://www.pdkintl.org/kappan/kbla9810.htm>
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

- Brown, A. L. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65–116). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Brown, A. L., & Palincsar, A. S. (1982). Inducing strategic learning from texts by means of informed, self-control training. Retrieved July 16, 2008, from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/2e/5d/ee.pdf
- Curriculum Development Council. (2001). *Learning to learn — The way forward in curriculum*. Retrieved January 18, 2008, from <http://www.edb.gov.hk/index.aspx?langno=1&nodeid=2877>
- Curriculum Development Institute. (2002). *Basic education curriculum guide — Building on strength: 5. School policy on assessment — Changing assessment practices*. Retrieved January 22, 2008, from http://cd1.edb.hkedcity.net/cd/basic_guide/BEGuideeng0821/chapter05.html
- Curriculum Development Institute. (2004). *Promoting assessment for learning in English language education at primary level*. Retrieved March 25, 2008, from http://cd1.edb.hkedcity.net/cd/eng/pafl_core/pafl.htm
- Education Bureau. (2008). *Seminar-cum-workshops on making good use of assessment data to enhance learning and teaching in the junior secondary English classroom*. Retrieved May 14, 2008, from [http://www.edb.gov.hk/FileManager/EN/Content_2800/making_good_use_of_assessment_data_new_-_020208_am\[1\].pdf](http://www.edb.gov.hk/FileManager/EN/Content_2800/making_good_use_of_assessment_data_new_-_020208_am[1].pdf)
- Education Commission. (2000). *Reform proposal for the education system in Hong Kong*. Retrieved March 24, 2008, from <http://www.e-c.edu.hk/eng/reform/annex/Edu-reform-eng.pdf>

- Education Development Center. (2008). *Questioning strategies during reading*. Retrieved June 4, 2008, from <http://www.literacymatters.org/adlit/questioning/during.htm>
- Fisher, R. (1998). Thinking about thinking: Developing metacognition in children. *Early Child Development and Care, 141*, 1–15.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-development inquiry. *American Psychologist, 34*(10), 906–911.
- Flavell, J. H. (1981). Cognitive monitoring. In W. P. Dickson (Ed.), *Children's oral communication skills* (pp. 35–60). New York: Academic Press.
- Flavell, J. H. (1985). *Cognitive development* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Hartman, H. J. (2006). *Higher level thinking strategies*. Retrieved June 2, 2008, from <http://condor.admin.ccny.cuny.edu/~hhartman/c4hot.html>
- Holt, J. (1964). *How children fail*. New York: Pitman.
- Iowa Department of Education. (2008). *Summative assessment (Assessment of learning)*. Retrieved March 24, 2008, from <http://www.iowa.gov/educate/content/view/1044/1172>
- James Cook University. (2007). *How to do a mind map*. Retrieved June 4, 2008, from <http://www.jcu.edu.au/studying/services/studyskills/mindmap/howto.html>
- Ko, S. (2005). *Online workshop program referral resource sheet*. Retrieved May 26, 2008, from <http://deoracle.org/fac-resources/faculty-development/online-workshop-program-referral-resource-sheet.html>
- Livingston, J. A. (1997). *Metacognition: An overview*. Retrieved January 22, 2008, from <http://www.gse.buffalo.edu/fas/shuell/cep564/Metacog.htm>

- Manitoba Education, Citizenship and Youth. (2006). *Rethinking classroom assessment with purpose in mind: Assessment for learning, assessment as learning and assessment of learning*. Retrieved July 10, 2008, from <http://www.wncp.ca/assessment/rethink.pdf>
- Marzano, R. J. (2000). *Designing a new taxonomy of educational objectives*. Thousand Oaks, CA: Corwin Press.
- Mok, Y. F., Fan, R. M. T., & Pang, N. S. K. (2007). Developmental patterns of school students' motivational- and cognitive-metacognitive competencies. *Educational Studies*, 33(1), 81–98.
- North Central Regional Educational Laboratory. (2004). *KWL*. Retrieved June 2, 2008, from <http://www.ncrel.org/sdrs/areas/issues/students/learning/lr2kwl.htm>
- Ogle, D. S. (1986). K-W-L group instructional strategy. In A. S. Palincsar, D. S. Ogle, B. F. Jones, & E. G. Carr (Eds.), *Teaching reading as thinking (Teleconference resource guide)* (pp. 11–17). Alexandria, VA: Association for Supervision and Curriculum Development.
- Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction*, 1(2), 117–175.
- Pang, N. S. K., & Lee, P. K. K. (2006). *Module 1 of the training program for school development committees of a Quality Education Funded project, "Metacognition in Learning and Teaching: Supporting Students' Learning Needs"* [in Chinese]. Hong Kong: Hong Kong Centre for the Development of Educational Leadership, The Chinese University of Hong Kong.
- Qualifications and Curriculum Authority. (2008). *Characteristics of AfL*. Retrieved March 24, 2008, from http://www.qca.org.uk/qca_4337.aspx

Rose, C., & Nicholl, M. J. (1997). *Accelerated learning for the 21st century: The six-step plan to unlock your master-mind*. New York: Dell.

Wray, D. (2005). *Reciprocal teaching: Questions and answers*. Retrieved June 4, 2008, from <http://www.warwick.ac.uk/staff/D.J.Wray/webarts/reciproc.html>