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STUDENTS AS THE DEFINITIVE SOURCE OF FORMATIVE ASSESSMENT:  
ACADEMIC SELF-ASSESSMENT AND THE SELF-REGULATION OF LEARNING

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If formative assessment is exclusively in the hands of teachers, then it is difficult to see how students can become empowered and develop the self-regulation skills needed to prepare them for learning outside university and throughout life. (Nicol & Macfarlane-Dick, 2006, p. 200)

Where am I going? How am I going? and Where to next? An ideal learning environment or experience occurs when both teachers and students seek answers to each of these questions. Too often, teachers limit students' opportunities to receive information about their performances in relation to any of these questions by assuming that responsibility for the students.... Students, too often, view feedback as the responsibility of someone else, usually teachers, whose job it is to provide feedback information by deciding for the students how well they are going, what the goals are, and what to do next. (Hattie & Timperley, 2007, pp. 88, 101)

This paper is an adaptation of a chapter I wrote for the *Handbook of formative assessment* (Andrade & Cizek, 2010). In that book, nearly every author identified the primary goal of formative assessment as providing feedback to students and teachers about the targets for learning, where students are in relation to those targets, and what can be done to fill in the gaps. In this paper, I will argue that students themselves can be thought of as the definitive source of such feedback, given their constant and instant access to their own thoughts, actions, and works. To researchers in the area of self-regulated learning, such a position is not new: It has long been known that effective learners tend to monitor and regulate their own learning and, as a result, learn more and have greater academic success in school (Pintrich, 2000; Zimmerman & Schunk, 2001). However, the assertion that students themselves are the definitive source of feedback is a relatively new way of thinking about the role of the student in assessment.

In this paper I make the case for students as key producers and consumers of formative assessment information, drawing on the research on self-assessment and self-regulated learning. My primary goals are to offer an expanded conception of the role that students can play in their own learning, as well as to propose practical approaches to scaffolding self-regulation and assessment. A secondary goal is to urge scholars of classroom assessment to scour the literature on self-regulated learning, which has produced a very nuanced view of the roles of standards, goal-setting, monitoring, feedback, and other topics central to assessment. My reading suggests that both scholarship and classroom practices related to assessment could benefit from a close examination of the literature on academic self-regulation. This paper represents just the tip of a very promising iceberg.

### Some Basic Definitions and Background

Self-regulated learning is the process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior in order to reach their goals (Pintrich, 2000). Self-assessment is a process of formative assessment during which students reflect on the quality of their work, judge the degree to which it reflects explicitly stated goals or criteria, and revise their work accordingly (Andrade & Boulay, 2003). To oversimplify a bit, studies of self-regulated learning have concentrated on how students manage learning *processes*, including, for example, understanding a text, sticking to a study schedule, or maintaining the motivation to achieve, while studies of self-assessment have focused on

students' judgments of the *products* of their learning, such as written papers, oral presentations, or solutions to mathematical problems. A central purpose of both self-assessment and self-regulation is to provide learners with feedback that they can use to deepen their understandings and improve their performances.

Hattie and Timperley's (2007) review of the research on feedback suggests that it can have very powerful effects on achievement, with a whopping average effect size of 0.79. They put this effect size into perspective by comparing it to other influences on achievement, including direct instruction (0.93), reciprocal teaching (0.86), and students' prior cognitive ability (0.71). They also note that, compared to over 100 factors known to affect achievement, feedback is in the top five to 10 in terms of effect size. They conclude that "feedback is among the most critical influences on student learning" (p. 102).

Although research has indicated that feedback tends to promote learning and achievement (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991; Brinko, 1993; Butler & Winne, 1995; Crooks, 1988; Hattie & Timperley, 2007; Kluger & DeNisi, 1996) if delivered correctly (Shute, 2008), most students get little informative feedback on their work (Black & Wiliam, 1998). This scarcity is due, in part, to the fact that few teachers have sufficient time in the typical school day to regularly and promptly respond to each student's work. Fortunately, research also shows that students themselves can be useful sources of task feedback via self-assessment (Andrade, Du & Wang, 2008; Ross, Rolheiser, & Hogaboam-Gray, 1999), and effective producers of process and regulation feedback via self-regulation (Boekaerts, Pintrich, & Zeidner, 2000; Nicol & Macfarlane-Dick, 2006; Zimmerman & Schunk, 2001). Because self-assessment and self-regulation involve students in thinking about the quality of their own products and processes rather than relying on their teacher as the sole source of evaluative judgments (or getting no feedback at all), they are key elements of formative assessment.

To date, however, only self-assessment has been included in theory and practice related to formative assessment. With few exceptions (e.g., Nicol & Macfarlane-Dick, 2006), self-regulation has received little consideration in the literature on formative assessment. A central argument of this paper is that self-regulation and self-assessment are complementary processes that can lead to marked improvements in academic achievement and autonomy. The following sections provide very brief overviews of scholarship on self-assessment and self-regulation in order to prepare a foundation for synthesis.

### Self-Assessment

As indicated previously, self-assessment is a process of formative assessment during which students reflect on the quality of their work, judge the degree to which it reflects explicitly stated goals or criteria, and revise accordingly. The emphasis here is on the word *formative*: Self-assessment is done on drafts of works in progress in order to inform revision and improvement. The primary purpose of engaging students in careful self-assessment is to boost learning and achievement. It does so by serving as a readily available source of feedback about the students' own understandings and performances.

According to the above definition, self-assessment is task-specific. This distinguishes it from other forms of self-assessment such as judging strong or weak abilities (e.g., reading, interpersonal skills, leadership, language). Such a process, which can be called self-reflection, is intended to promote self-discovery and awareness (Harrington, 1995) rather than to improve performance on a specific task.

Self-assessment is also not a matter of determining one's own grade. That is self-evaluation, which involves students in grading their work, perhaps as part of their final grade for an assignment or a class (e.g., Sadler & Good, 2006). Given what we know about human nature, as well as findings from research regarding students' tendency to inflate self-evaluations when they will count toward formal grades (Boud & Falchikov, 1989), I subscribe to a purely formative type of student self-assessment.

### *Features of Self-Assessment*

There are number of ways to engage students in effective self-assessment. In general, the process involves three steps. The first step is *articulating expectations*. The expectations for the task or performance are clearly articulated, either by the teacher, by the students, or both together, perhaps by reviewing model assignments and/or co-creating a rubric.

The second step involves *critique of work in terms of expectations*. Students create rough or first drafts of their assignment, be it an essay, word problem, lab report, volleyball serve, or speech. They monitor their progress on the assignment by comparing their performances-in-progress to the expectations. An example from writing (Andrade, Du, & Wang, 2008) involves students in seeking evidence of success in their drafts. Using colored pencils, students underline key phrases in a rubric with one color (e.g., they underline "clearly states an opinion" in blue on their persuasive essay rubric), then underline or circle in their drafts the evidence of having met the standard articulated by the phrase (e.g., they underline their opinions in blue in their persuasive essay drafts). If they find they have not met the standard, they write themselves a reminder to make improvements when they write their final drafts. This process is followed for each criterion on the rubric, with pencils of various colors.

The third, and final, step is *revising*. In this step, students use the feedback from their self-assessments to guide revision. This last step—revision—is crucial. Students are savvy, and will not self-assess thoughtfully unless they know that their efforts can lead to opportunities to actually make improvements.

### *Conditions for Self-Assessment*

Although even young students typically are able to think about the quality of their own work, they do not always do so. Often this is because one or more necessary conditions are not present. According to Goodrich (1996), in order for effective self-assessment to occur, students need:

1. awareness of the value of self-assessment
2. access to clear criteria on which to base the assessment
3. a specific task or performance to assess
4. models of self-assessment
5. direct instruction in and assistance with self-assessment, including feedback
6. practice
7. cues regarding when it is appropriate to self-assess, and
8. opportunities to revise and improve the task or performance

This list of conditions might seem prohibitive but student self-assessment is feasible and is occurring in many schools around the world (Deakin-Crick, Sebba, Harlen, Guoxing, & Lawson, 2005). Several of the key conditions listed above, including modeling, cueing, direct instruction, and practice, are commonly employed classroom practices. The second condition—access to

clear criteria on which to base self-assessment—can be met by reviewing models and/or introducing a rubric (Andrade, 2000).

### *Research on Self-Assessment*

Actively involving students in self-assessing their work has been associated with noticeable improvements in performance. Research on the effects of student self-assessment covers a wide range of content areas including social studies (Lewbel & Hibbard, 2001), science (Duffrin, Dawes, Hanson, Miyazaki, & Wolfskill, 1998; White & Frederiksen, 1998), and external examinations (MacDonald & Boud, 2003). In each case, students were either engaged in written forms of self-assessment using journals, checklists and questionnaires, or oral forms of self-assessment, such as interviews and student-teacher conferences.

Much of the research on self-assessment has focused on writing and mathematics. Studies of writing have found a positive relationship between self-assessment and quality of writing (Andrade & Boulay, 2003; Andrade, Du, & Wang, 2008; Ross, Rolheiser & Hogaboam-Gray, 1999). The improvements in students' writing include more effective handling of sophisticated qualities such as ideas and content, organization, and voice—not just mechanics. In mathematics, self-assessment has been associated with increased autonomy and mathematical vocabulary (Stallings & Tascione, 1996), and dramatically higher performances on word problem solutions (Ross, Hogaboam-Gray, & Rolheiser, 2002). Black, Harrison, Lee, Marshall and Wiliam's (2004) study of formative assessment practices in math and science classes for 11-15 year olds also revealed a strong relationship between formative assessment, including self-assessment, and achievement. These authors concluded that “the development of self-assessment by the student might have to be an important feature of any programme of formative assessment” (p. 14).

Another possible benefit of self-assessment is that it could be helpful to students who do not seek help or engage in learning because of perceived threats to self-esteem or social embarrassment (Hattie & Timperley, 2007). By self-assessing, students engage in the important processes of reorienting to the goals of an assignment and determining how to make improvements, without the threat of negative feedback or perceived insults from a peer. The ego-protective feature of self-assessment may be especially important for some students. This might explain, in part, why students typically report that they value it (Andrade & Du, 2007) as long as it does not become self-evaluation by counting toward a grade (Ross, Rolheiser, & Hogaboam-Gray, 1998).

Although the research on self-assessment has illuminated a powerful way in which students can serve as both the producers and consumers of feedback, it has been limited by a focus on concrete products, assignments, and tasks. Hattie and Timperley's (2007) review of feedback placed a strong emphasis on the need for feedback on processes and regulation as well as on tasks. The field of self-regulated learning represents a rich source of information about how students generate and respond to feedback about *how* they work.

### Self-Regulated Learning

Being a self-regulated learner means exercising executive control over one's own learning or, to use the lingo of young learners, “being the boss of yourself.” More formally, self-regulated learning is a dynamic process of striving to meet learning goals by generating, monitoring, and modifying one's own thoughts, feelings, actions and, to some degree, context. Self-regulated

learners use a wide variety of strategies and tactics to promote learning, such as task interpretation, goal setting, planning, selecting and adapting learning strategies, seeking help and feedback, managing affect and motivation, administering rewards, arranging study spaces and schedules, and monitoring and evaluating progress toward their goals. Self-regulation is situated within a complex context, including but not limited to the classroom. As a result, it influences and is influenced by a multitude of factors, including personal characteristics (e.g., temperament, self-efficacy, motivation), social circumstances (e.g., family and cultural values, peer pressure, teacher expectations), and physical conditions (e.g., noisy or quiet, online or face to face), each of which reciprocally influences the others (Boekaerts, Pintrich, & Zeidner, 2000; Butler & Cartier, 2004; Pintrich, 2000; Winne, 2001; Zimmerman & Schunk, 2004).

### *Features of Self-Regulated Learning*

There are many elements of self-regulation, and several competing models (e.g., Butler & Cartier, 2004; Pintrich, 2000; Winne, 2001; Zimmerman, 2000), each of which make important contributions to our emerging understanding of this complex phenomenon. One of the most commonly accepted models was proposed by Zimmerman (2000). The model includes three main phases that function cyclically: *Forethought*, which precedes efforts to learn and involves consideration of the goals, expectancies, and standards for the task at hand, as well as strategic planning and self-efficacy judgments; *Performance or Volitional Control*, which occurs during learning and involves self-monitoring and the use of learning management strategies; and *Self-reflection*, a phase that follows learning efforts and involves the self-evaluation of mastery, causal attributions, and reactions to the task and performance; self-reflection leads back to the forethought phase that precedes the next learning efforts. Each of the three phases of Zimmerman's model has multiple components. For example, the forethought phase involves analyzing a task, setting goals for performance, selecting strategies, making plans, managing one's motivational beliefs and expectations, and so on.

I am focused on the aspects of self-regulation most closely associated with self-assessment. Zimmerman's model includes two sub-phases that involve explicit self-assessment: self-observation and self-judgment. Self-observation means tracking specific aspects of one's own performance, the conditions that surround it, and the effects that it produces as one engages in a task. In other words, self-observation means paying attention to what you are doing, why you are doing it, and how it helps you (Schoenfeld, 1987). Self-judgment involves judging one's performance against criteria or standards. It also entails making causal attributions by determining, for example, whether poor performance is due to ineffective learning strategies, insufficient effort, a lousy teacher, or something else.

I chose to use Zimmerman's model in this paper because of its elegant simplicity but it is important to note the existence of other, more detailed models with potential usefulness in terms of classroom assessment. Winne and Hadwin's information processing model of self-regulation (1998; Winne, 2001), for example, includes (among other things) five elements: Conditions, Operations, Products, Evaluations, and Standards (COPES). Standards, of course, are the qualities that the products of student learning—either ephemeral, such as thought experiments, or concrete, such as a written essay—are supposed to have. Evaluations “characterize the fit between standards and products” (Winne, 2001, p. 163) and can be generated internally by learners or externally by others. Winne and Hadwin (1998) provide a comprehensive accounting of self-regulation that has since been analyzed and endorsed by their peers (Greene & Azevedo,

2007); future scholarship on classroom assessment in general and self-assessment in particular could benefit from a similar analysis.

### *Research on Self-Regulated Learning*

Several decades of study of self-regulated learning have produced a rich and elaborate body of knowledge. Briefly, the research suggests that self-regulation and academic achievement are closely related: Students who set goals, make flexible plans to meet them, and monitor their progress tend to learn more and do better in school than students who do not. Less effective learners, in contrast, have minimal self-regulation strategies and depend much more on external factors such as the teacher, peers, or the task for guidance and feedback (Hattie & Timperley, 2007; Pintrich, 2000; Zimmerman & Schunk, 2004).

Research suggests that the type of goals set by students matters. For example, in a study of students in an educational psychology course, Morgan (1985, as cited in Winne, 2001) showed that students who set specific goals related to the conditions, products, and standards of their studying learned more than students who either set goals related to the amount of time spent studying or general goals such “learn the material”. Apparently, the students who set specific goals benefitted from having “subject-matter relevant standards for monitoring” (p. 175) their learning, a conclusion that echoes the findings of the studies of self-assessment reported above.

The literature on self-regulated learning reveals that the role of goal-setting in learning is more complicated than that, however. For one example, research has shown that students benefit from setting process as well as product goals, in that order (e.g., Zimmerman & Kitsantas, 1999). This is part of that “nuanced view” I mentioned earlier: We have a lot to learn from studies of self-regulated learning.

Fortunately, academic self-regulation is learnable. Studies have shown that all kinds of students, including those with mild to moderate cognitive impairments (Brown & Palincsar, 1982), can learn to monitor and regulate their own learning more effectively.

### A Synthesis

In addition to having much in common with each other, theories of self-assessment and self-regulation have many commonalities with recent scholarship on formative assessment. The simple model in Figure 1 represents formative self-assessment as an integral component of self-regulation. The figure draws on the three phase model of self-regulation proposed by Zimmerman (2000) and includes: *Forethought*, which is when learners set goals and make plans for reaching them; *Performance and Control*, which occurs during learning and involves self-monitoring and the use of learning management strategies; and *Reflection*, during which learners evaluate and reflect on their work.

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 Insert Figure 1 about here.  
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The model also incorporates the conception of feedback in learning proposed by Hattie and Timperley (2007), in which they identify the main purpose of feedback as reducing discrepancies between one’s goal and one’s current understandings and performance. According to Hattie and Timperley, feedback that effectively closes the gap between current states and the target must address three questions: “Where am I going? (What are the goals?), How am I going [or doing]?”



(What progress is being made toward the goals), and Where to next? (What activities need to be undertaken to make better progress?)” (p. 82). As indicated in Figure 1, self-regulation theory posits that effective learners ask similar questions, and engage in regular self-assessments of their work.

Figure 1 represents a synthesis of Zimmerman’s taxonomy and the three questions posed by Hattie and Timperley (2007): Forethought involves learners in asking “Where am I going?” and “What are the goals?” The performance and self-reflection phases include, among other things, self-assessment by asking, “How am I doing? What progress is being made toward the goals?” as well as “Where to next? What activities need to be undertaken to make better progress?” The link between the performance and control phase and the reflection phase indicates how effective learners will respond to perceived deficiencies in their work or approaches to it by revisiting and revising it.

### *Oneself as a Source of Formative Assessment*

“Where am I going?” “How am I doing?” “Where to next?” These questions can refer to the quality of one’s work or one’s learning processes, depending on how they are asked and answered. Hattie and Timperley (2007) noted that feedback that aims at improving students’ strategies and processes *as well as* making improvements in the task at hand are most powerful. The key challenge for educators, of course, is in figuring out how to scaffold self-assessment and regulation while at the same time teaching important content and skills. This section describes several such efforts. It does not refer to stand-alone courses that teach self-regulation skills (e.g., Dembo & Seli, 2008).

Some scholars have capitalized on the similarities between self-regulation and self-assessment and designed instructional techniques that promote both. Paris, for example, created a portfolio assessment process that scaffolds self-regulation (Paris & Ayres, 1994), and has written about the role of self-assessment in providing students with opportunities to monitor and understand their own learning (Paris & Paris, 2001). Gregory, Cameron and Davies (2000) have created a collection of self-assessment and goal-setting techniques for use in middle and high school classrooms. Perry, VandeKamp, Mercer, and Nordby (2002) emphasize how even young learners in third grade can effectively self-regulate their behaviors after analyzing the results of a non-threatening assessment. These and other approaches described below combine the goals of student self-regulation and self-assessment in practical classroom applications, often emphasizing one or the other. In each case, recommendations are made for enhancing the regulatory or assessment aspects of the instructional design.

### *Strategic Content Learning*

Butler (2002) designed an instructional model called Strategic Content Learning (SCL) in order to promote self-regulated learning in secondary and post-secondary students with learning disabilities. Her approach emphasizes the value of co-constructing learning strategies with students rather than teaching predefined strategies. Butler recommends, among other things, having students submit a list of performance criteria and personalized learning strategies as part of an assignment, and helping students self-evaluate their work prior to submission. She also recommends promoting strategy development by facilitating discussions about strategies that might meet task demands, having students try them out, and articulating strategies they plan to use in the future.

For instance, one English teacher in Butler's (2002) study created a strategy form that students revised and turned in across a sequence of writing assignments:

In a first column students described each assignment in turn (e.g., writing a first narrative paragraph). In a second column students outlined the strategies they planned to use to complete that row's assignment. In a third column, students interpreted teacher feedback on each assignment in light of specific task criteria (generated in a class discussion before starting the project). In a final column, students recorded ideas they had about how to improve their performance for the upcoming assignment. (p. 90)

The process described by the English teacher includes a minor element of self-assessment—co-creating task-specific criteria for an assignment—as well as major components of self-regulation. In order to more comprehensively include self-assessment, a column or separate form could be added that asks students to assess their work according to the co-created task criteria before receiving and interpreting their teacher's feedback. A hypothetical example of such a form is shown in Figure 2. The form reveals that the student using the form has completed a persuasive essay assignment and is working on an autobiography. The strategies used by the student, the student's self-assessment, the teacher's feedback, and ideas for making improvements to future writing projects are shown.

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 Insert Figure 2 about here.  
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### *Project-Based Portfolio Assessment*

Alonso-Tapia (2002) studied a project-based portfolio assessment for 14 to 16-year-olds that includes both process-oriented self-regulation and task-specific self-assessment. As part of the portfolio process, students produce and reflect on written work. They write responses to questions referring to the writing process, such as: "What strategies have I used to decide what to say? Does my portfolio include drafts, schemes or products deriving from brainstorming? What questions have I asked myself to organize the text? Have I considered the purpose of my essay and the readers' needs? Have I considered potential arguments against my point of view and accepted them (as far as possible)? Have I revised the written text?" Students also respond to questions referring to the content of their writing: "Have I articulated my point of view well enough? Why do I think so? What kinds of comment have I received from my classmates about my point of view? Do I agree with them or not? Why?"

Portfolios like those described by Alonso-Tapia (2002) are especially good vehicles for reflection on process and product; in fact, reflection is one of the primary purposes of portfolio-based assessment (Brookhart, 2008; Danielson, & Abrutyn, 1997; Seidel et al., 1997; Wolf, 1989). In order to enhance the self-assessment aspect of this portfolio project, students could be engaged in generating a list of qualities of excellent pieces of work, and in a process of judging their own work in relation to those qualities. This process would be followed by opportunities to revise.

*King's Medway Oxford Formative Assessment Project (KMOFAP)*

A final example of a classroom practice that combines self-regulation and self-assessment comes from work done by Black, Wiliam, and their colleagues on formative assessment practices in classrooms (2004), which emphasizes the importance of student self-assessment. Some of the approaches they describe represent a blurring of the distinction between self-assessment and self-regulation because they require students to assess their understanding of a topic or lesson—a metacognitive act.

A tool they called “traffic lights” serves as a powerful example of the integration of self-assessment and self-regulated learning. Students in the math and science classes they studied used red, amber and green icons to indicate their perceptions of the extent to which they understood the content being studied. They did so in a variety of ways, such as labeling their work with a color, or placing a red, amber, or green cup on their desks during a lecture or demonstration (Wiliam, 2008). The teachers could immediately respond to the students’ confidence in their understanding by, for example, pairing up the greens and ambers to clarify areas of confusion between them, while the teacher helps the red students as a group. According to Black, Harrison, Lee, Marshall and Wiliam (2004), the traffic lights allowed for “instant differentiation but the recognition of the learning needs has been done by the students, allowing the teacher to focus on steering the remedial action. Because the response to their needs is immediate, students begin to realize that revealing their problems is worthwhile, as the focus of the teaching is to improve learning” (p. 52).

Strategic Content Learning, portfolio-based assessment, and traffic lights represent a small sample of the many ways in which students can be their own and their teachers’ best source of formative assessment information. Students have instant, ongoing access to their own thoughts, actions, and works, and there is ample evidence that they can accurately self-assess and self-regulate under the right conditions (Paris & Paris, 2001). The challenge is in creating the right conditions.

### General Principles for Supporting Self-Assessment and Self-Regulation

Lacking supportive conditions, students across the K-16+ educational span often do not have well-developed skills in self-assessment and self-regulation. Self-evaluation strategies were found by Zimmerman and Martinez-Pons (1988) to be one of the least used self-regulation strategies by American students and, writing about their work with 11–15 year-olds in the United Kingdom, Black et al. (2004) state that one of their most difficult tasks was helping students to think of their work in terms of learning goals. This section presents a list of general principles for classroom practices that cue, scaffold, and even push students to self-regulate and self-assess.

#### *Creating a Culture of Critique*

It is easy to blame students for failing to think about their own work or thinking but the extant assessment and evaluation ethos can inhibit self-assessment and regulation (Ames, 1992). Hattie and Timperley (2007) note that “the climate of the classroom is critical, particularly if disconfirmation and corrective feedback at any level is to be welcomed and used by the students (and teachers). Errors and disconfirmation are most powerful in climates in which they are seen as leading to future learning” (p. 100). As with many other school-related topics, self-assessment

and self-regulation are likely to work only when students perceive them to be valued and valuable, and to the extent that teachers' messages about the relationships between effort, understanding, and grades are influential.

### *Where Am I Going? Setting Learning Goals*

Research on the effectiveness of feedback has shown that “goals without clarity as to when and how a student (and teacher) would know they were successful are often too vague to serve the purpose of enhancing learning” (Hattie & Timperley, 2007, p. 88). Effective goal setting involves articulating clear, reasonably challenging goals regarding the type or level of performance expected of students. Students should set goals for nearly everything, more or less—assignments, the processes they are using to complete them, and the regulatory mechanisms they employ.

One popular way to set task-specific goals is to distribute a rubric to students or, better, to co-create one with them. Checklists, scoring guidelines, and detailed assignment briefs can serve the same purpose, particularly when they are discussed or generated with students (Andrade, 2000; Butler, 2002). Genuine interaction between teacher and students enhances the process of goal setting because “goals are more effective when students share a commitment to attaining them” (Hattie & Timperley, 2007, p. 89).

Because “a great deal of student behavior that we see in the context of the classroom should be labeled as ‘compliance’, ‘self-control’ or ‘self-management’ rather than self-regulation” (Boekaerts, 2001, p. 598), Boekaerts highlights the need to distinguish between students’ personal goals and teachers’ imposed goals. Students’ personal goals are often related to valued future goals. Brickman and Miller (2000) have illustrated the ways in which goals that students believe are instrumental to future goal attainment, such as attending college or beginning a career, provide the foundation for meaningful self-regulation. In light of this and related research, teachers should engage students in setting goals that are meaningful to them.

### *How Am I Doing? Aiding Students in Generating Feedback for Themselves*

In previous portions of this paper I have presented evidence that students can provide feedback for themselves under the right conditions. The right conditions include at least the following (Andrade & Valtcheva, 2009; Butler, 2002; Macguire, Evans, & Dyas, 2001; Ross, 2006; Thompson, Pilgrim, & Oliver, 2005):

1. guidance in articulating the criteria by which they assess their learning processes and products,
2. learning how to apply the criteria by assessing their work and approaches to it,
3. getting feedback on their self-assessments of both process and product,
4. being offered help in using self-assessment data to improve,
5. providing sufficient time for revision of assignments and adjustments to strategies,
6. making some self-assessments private, since students might say or write what they think their teachers want to read, and
7. *not* turning self-assessment into self-evaluation by counting it toward a grade.

In addition, the self-assessment done by students should be near-term. According to Zimmerman (2000) the “temporal proximity of one’s self-observations is a critical variable. Self-feedback that is delayed precludes a person from taking corrective action in a timely fashion” (p. 20).

Finally, a caveat: Feedback has its limitations. According to Hattie and Timperley (2007), feedback is “not ‘the answer’; rather, it is but one powerful answer. With inefficient learners, it is better for a teacher to provide elaborations through instruction than to provide feedback on poorly understood concepts.... Feedback can only build on something; it is of little use when there is no initial learning or surface information” (p. 104). This general caveat might also apply to self-generated feedback in particular: In a review of student self-ratings, Boud and Falchikov (1989) concluded that high achieving students tended to underrate their performance, while lower achieving students tended to overrate it. This finding has been replicated in more recent research (e.g., Dochy, Segers, Sluijsmans, 1999), and leads to the not surprising implication that students who struggle with school work need extra help understanding their tasks, the criteria for them, and the self-assessment process.

### *Where to Next? Providing Time and Assistance with Revision or Revisiting*

Closing the gap between where students are and where they are headed is what makes formative assessment and feedback effective (Sadler, 1989). Students are unlikely to thoughtfully self-assess or self-regulate unless they know these acts will lead to better grades, deeper understanding, and more well-developed skill sets. Thus, revision and revisiting are essential components of self-regulation and assessment.

In addition to the obvious need to allow and encourage students to revise their work and rethink their approaches to it, there is the less obvious need to explicitly revisit causal attributions, or students’ beliefs about the internal and external causes of their success or failure (Weiner, 1986). Given what is known about the influence of causal attributions on strategy choices, persistence, and achievement, it is essential to teach students to make accurate attributions.

The question “Where to next?” can also be extended to other contexts and assignments. Citing the literature that argues for mindful approaches to transfer (e.g., Perkins & Salomon, 1989), Butler (2002) notes the need to help students construct self-regulatory skills that can transfer to subsequent learning. She argues that this can be done by promoting self-regulation in the context of meaningful work, supporting students in articulating strategies in their own words, and having students discuss when and why certain strategies promote success.

### Concluding Remarks

Though scholars tout the value of actively engaging students in the assessment process, our understanding of the elements of such engagement is still under development. One promising avenue is the exploration of what is already known about how effective learners manage their own learning, and the creation of relevant assessment models, principles and practices that can cue, scaffold, and even push students to self-regulate and self-assess. Since students have exclusive access to their own thoughts and actions, they can and should be considered the definitive source of formative assessment information.

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Figure 1. Self-Regulated Learning and Formative Self-Assessment

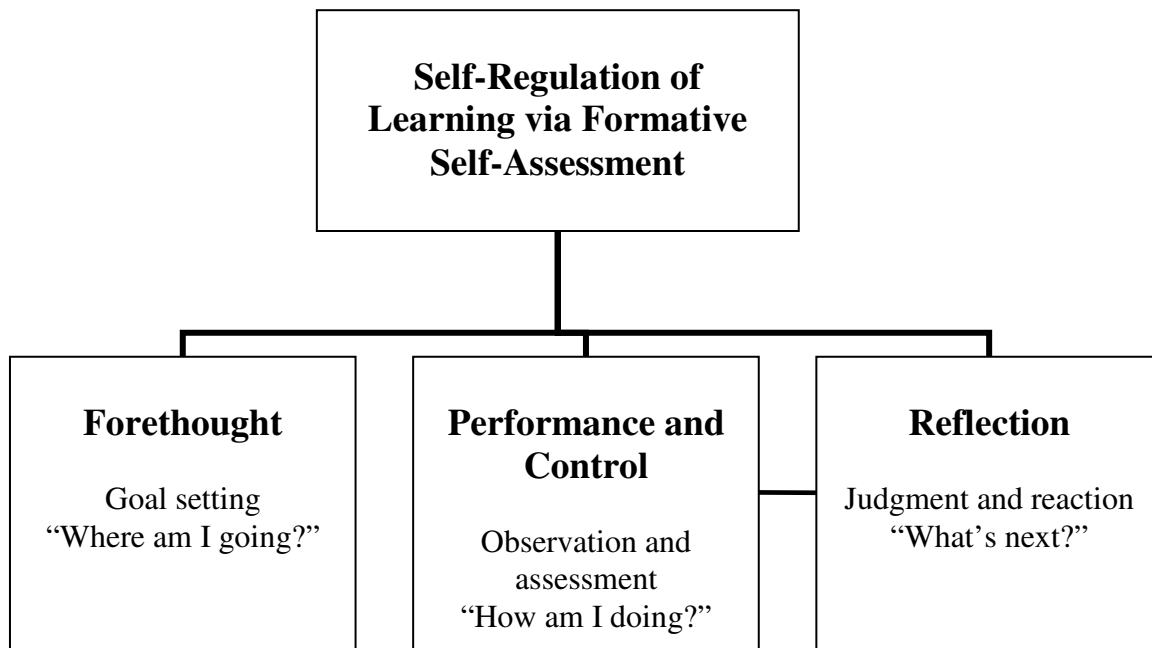


Figure 2. Strategy Form (Adapted from Butler, 2002)

Assignment	Strategies	Self-Assessment	Teacher's Feedback	Improvements Next Time
1. Persuasive essay	1a. Go over the rubric. 1b. Brainstorm reasons, pro and con. 1c. Write an outline. 1d. Write first draft. 1e. Self-assess according to the rubric 1f. Revise 1g. Get feedback from teacher. 1h. Write final draft.	My first draft has strong reasons for my opinion but doesn't consider other points of view. My sentences are correct but the tone is boring and spelling is a mess.	Your second draft has clear, relevant reasons in support of your claim, and touches on the opposite point of view. You could elaborate on why your opinion is better. I recommend finding words and phrases that make it sound like you care about this topic, and using the computer to spell check.	Pick a topic that I care about.
2. Auto-biography	2a. Read rubric & an autobiography to see how it is written. 2b. Look at photos of my life to get ideas for a theme. Etc....			