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Adjusting Curricular Design to "CREATE" a Culture of Self-Regulation

Rylan Egan
Memorial University of Newfoundland, re98ad@gmail.com

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Adjusting Curricular Design to "CREATE" a Culture of Self-Regulation

Abstract
Developing learners' ability to self-regulate their own learning has been an ideal sought after by researchers and practitioners alike. Over the past 40 years a plethora of educational psychology research on self-regulated learning (SRL) has flooded the literature. In this article I attempt to consolidate key theories from this literature base and propose a 6-point strategy to CREATE a culture of SRL. I will argue that instructors must *communicate* proximal and long-term goals that have been negotiated by a community of learners, substantially *reward* all positive aspects of the learning process, judge and reward the learning process by assigning *elaborative* learning assessments, realistically *attribute* success and failure to appropriate processes, and *tune* ineffective strategies and goals to allow the curriculum to *evolve* in accordance with learner difficulty and success.

Enseigner aux apprenants la capacité d'autoréguler leur propre apprentissage est un idéal que poursuivent les chercheurs et les praticiens. Au cours des quarante dernières années, il y a eu surabondance d'études sur l'autorégulation de l'apprentissage dans la littérature sur la psychologie de l'éducation. Dans cet article, l'auteur tente de regrouper les principales théories tirées de cette documentation et de proposer une stratégie composée de six éléments contribuant à la création d'une culture de l'autorégulation. Il soutient que les enseignants doivent *communiquer* les objectifs à court et à long terme convenus par les apprenants, *reconnaître* de façon marquée tous aspects positifs du processus d'apprentissage, évaluer et reconnaître ce processus en donnant des travaux *élaborés* afin de mesurer l'apprentissage, *attribuer* de façon réaliste les succès et les échecs aux processus appropriés et adapter les stratégies et buts inefficaces afin de permettre l'*évolution* du curriculum en tenant compte des difficultés et des réussites des apprenants.

Keywords
self-regulation; formative assessment; learning goals; attribution; deep processing

Cover Page Footnote
I would like to thank Dr. Philip Winne for his mentorship and advice during the writing of this transcript.

For the past three decades educational research has focused on promoting self-regulated learning (SRL) to encourage students to bolster and self-support their own academic progress (Boekaerts, Pintrich, & Zeidner, 2000a; Schunk & Zimmerman, 2008). A vast number of books and articles have been written on interactions between self-regulated learning and other variables including: motivation, technology, cognitive and metacognitive processes, and instructor-learner interactions (e.g., Bandura, 2001; Biswas, Leelawong, Schwartz, & Vye, 2005; Brown, Campione, & Day, 1981; Carver & Scheier, 1998; Elliot & Dweck, 2005; McMahon, 2002; Patrick & Middleton, 2002; Perry, VandeKamp, Mercer, & Nordby, 2002; Schunk & Zimmerman, 2008; Winne & Hadwin, 1998; Winne, Hadwin, & Gress, in press). Although theorists from diverse domains and epistemological perspectives have developed different models of SRL, all models share four important assumptions: (a) internal and external stimuli can be mediated by the learner (such as prior knowledge, task constraints, and setting); (b) there is a bi-directional influence between SRL and affective factors (such as motivation, interests, attributions, and self-efficacy); (c) learners are able to make inferences about their learning by comparing their current state to internal or external goals or standards; and (d) learners are capable of using adaptive strategies to control some features of their learning situations (Boekaerts, Pintrich, & Zeidner, 2000b; Boekaerts & Niemivirta, 2000; Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000).

It is essential, at least initially, that curriculum is structured in a manner that scaffolds the motivational aspects of SRL. As Reeve, Ryan, Deci, and Jang (2008) put it: "although autonomous self-regulation is the destination, the road goes through social regulation, reflecting the ancient Chinese proverb, *Start with your master, end with yourself*" (p. 239). The following analysis will explore a curricular design intended to nourish self-regulatory skills and abilities by developing a classroom culture that fosters SRL. The process has been construed as a six-step recursive process, termed CREATE. In this paper I will argue that to create a positive environment for SRL, instructors must ***C****ommunicate* proximal and long-term goals that have been negotiated by a community of learners, substantially *Reward* all positive aspects of the learning process, judge and reward the learning process by assigning ***E****laborative* learning assessments, realistically ***A****ttribute* success and failure to appropriate processes, and ***T****une* ineffective strategies and goals to allow the curriculum to ***E****volve* in accordance with learner difficulty and success. In the analysis that follows, each of these key processes will be discussed along with suggestions and considerations for implementation.

Communication of Goals

By definition, SRL is a learner-centred activity that identifies and encourages the most accurate, efficient, and adaptive strategies for building knowledge in a particular situation. To facilitate SRL it is important for instructors and learners to communicate and to negotiate proximal and long-range goals. Pintrich (2000) acknowledges the importance of goal setting in his definition of SRL, indicating that it is a process whereby learners "set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior" (p. 453).

According to Zimmerman (2008) effective goals are specific, proximal, hierarchical (i.e., both short and long term), correctly focused (i.e., initially focused on process outcomes), and self-set (created by the student and/or internalized). It is important that instructors negotiate goals with these qualities prior to starting a new semester, unit, or lesson (Ley & Young, 2001). Although negotiation throughout the course may not always be possible an explanation why each goal was chosen should still be provided (Reeve, Ryan, Deci, & Jang, 2008). Instructors should attempt to negotiate progressively more specific goals. Initially goals may be broad and focused on the long term, such as those associated with the direction

and purpose of a course. However, throughout the course the instructor should attend to specific goals along with the appropriate activities for their fulfilment.

Through the process of both proximal and long-term goals provide learners with something to "shoot for today" and a direction for the future (Zimmerman, 2008). Participants who received both proximal (or process) and long-term (or outcome) goals performed better on both athletic and academic tasks in three related studies by Zimmerman and Kitsantas (1996, 1997, 1999). More specifically, participants performed better when they initially concentrated on process goals, shifting to outcome goals as automaticity developed. For example, an instructor may concentrate on learners' conceptual understanding (e.g., difference between multiplication and addition), but as skills clearly become well understood the focus may shift to outcome goals (e.g., a demonstration with manipulatives).

To ensure that goals are internalized and inspire intrinsically motivated volition, negotiation and participation must be used to develop learner autonomy during the goal setting process (Reeve, Deci, & Ryan, 2004). Internalization refers to the integration of external goals into the collection of goals learners have set for themselves. Activities implicit to the negotiation of goals such as listening, asking for learners' opinions, encouraging learner voice, providing rationales, and being responsive have been shown to facilitate autonomous learning (Reeve et al., 2004; Reeve, Jang, Carrell, Barch, & Jeon, 2004). Often establishing relevance to learners' own experiences and interests can help in this process. Activities such as self-reflection, identification of relevant personal experiences, and predicting personal future implications can be useful. In turn, autonomous learning supports intrinsic motivation, which supports mastery-approach orientation, and thus the persistence required for effective self-regulation (Shih, 2008; Reeve et al., 2008). Importantly however, "supporting intrinsic motivation does not mean avoiding external and teacher-initiated events" (Reeve et al., 2008). By negotiating goals in a pressure free environment while acknowledging negative feelings and providing a sense of relatedness, instructors can help learners internalize externally negotiated goals (Reeve et al., 2008).

If goals are not co-developed, or worse not provided at all, the classroom culture becomes one in which goal setting is not valued (Harris, 2007). This type of culture is problematic as learners (and all people) first adopt the attributes and norms of their culture, and then (in part) use these attributes to govern their lives (Fay, 1996; Harris, 2007). Learners who do not set goals, or set goals that are not complimentary to the learning process, may not have appropriate standards to measure the extent of their learning. Similarly, if instructors have not negotiated specific and quantifiable goals, feedback will be more arbitrary and therefore less accessible to the learner (Kluger & DeNisi, 1996). By setting, referring to, and comparing outcomes with goals, learners have an opportunity to experience and emulate the first steps of effective SRL (Zimmerman, 2008).

Reward

Instructors have the responsibility to grade learners' work in a fair and accurate manner. Importantly, they must also determine what types of assessment will be given, and the relative weight of each. Instructors usually assign grades to reflect perceived learner competency. However, grades are also used to support or punish, communicate values, and establish expectations (McMillan, 2001; Messick, 1989). If, to learners, grades are interpreted as a reflection of ability, they will play a significant role in enhancing or undermining their perceived ability to effectively perform a given task (Bandura, 1998). Grades can also represent barriers to further education or employment, determine parental approval, or be

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construed as remuneration for work completed (thus eliciting strong feelings when "compensation" is perceived to be inadequate) (Goulden & Griffin, 1995; Zimmerman, Bandura, & Martinez-Pons, 1992).

Given the importance and sensitivity of grading, educators must carefully consider the messages their grades (if used at all) are communicating. According to Black, Harrison, Lee, Marshall, and Wiliam (2004) instructors tend to rely on assessment strategies that interfere with learning and that deemphasize personal improvement. Through standardized and/or internal (e.g., exam, term test, chapter quiz) summative tests, right/wrong answers, and tests without specific feedback motivation and learning can be diminished (Brookhart, 2003; Harlen, 2005; Stiggins, 2002). Worse, such feedback, or lack of feedback, may communicate that the instructor does not value critical reflection and believes that intelligence is fixed (Black et al., 2004.; McMillan, 2001). Assessments such as these also discourage self-regulation as "[s]tudents often pay less attention to feedback and more to the grade or score that 'counts' in the final grade and thus learn less from the feedback than they might otherwise" (Brookhart, 2003, p. 8).

In contrast, assessment *for* learning (sometimes referred to as formative assessment), is underutilized and therefore does not provide learners or instructors with the opportunity to reflect on, find, investigate, and create strategies to overcome errors (e.g., Black et al., 2004; Black & Wiliam, 1998; Harlen, 2005; McMillan, 2001; Stiggins, 2002). The under-reliance on assessment tools to discover, inform, and provide data for adjusting learning successes or failures *during* the learning process is problematic. Black and Wiliam (1998) found "in a review of evidence published in over 250 articles by researchers from several countries" that there was unequivocal "evidence that improving formative assessment raises standards" (p. 9).

It is important for instructors to model processes of self-regulation through their assessment practices. Learners must be rewarded as ardently for identifying their misunderstandings and correcting misconceptions, as they are for demonstrating competencies. By assigning tasks that require the identification of misunderstood concepts, learners are also provided with the opportunity to work in groups to engage in peer tutoring, and self/peer assessment; these techniques contribute to academic self-efficacy and comprehension (McDonald & Boud, 2003; Noonan & Duncan, 2005; Palincsar & Brown, 1984). By tracking assignments that stress the identification of learning barriers, instructors also have the opportunity to identify problems, address underlying causes, and potentially adjust the curriculum accordingly. According to Harris (2007), identifying difficulties is important, as "teachers are clearly more effective if they address pupils' individual needs by making it their business to know at what state of development each pupil is and how to assist them in moving to the next stage" (p. 252). If classrooms are too large to provide customized feedback, it is essential that seminars, tutorials, or teaching assistants serve this function.

Using formative assessment in a summative fashion is not a new concept. Carter (1997) advocated for a test analysis technique that "with[held] the final gratification of a grade assignment until the learner complete[d] a thorough analysis of his or her performance on the test" (p. 68). Black et al. (2004) and Harlen (2005) advocated for using summative assessments to inform learners of mistakes, and advocate for active reflection. Harlen (2005) describes a process where formative assessments can have summative functions; although she admits that this approach has its drawbacks and must be implemented carefully. Maxwell (2004) advocates for progressive assessment which allows recent indicators of performance to supersede more latent results, thus rewarding learners for what they know now, not what they knew before. Hybrid assessment techniques such as these are promising and are supported by a vast array of evidence (see review by Black & Wiliam, 1998); however to improve the climate for self-regulation, a further step must be taken.

Deficiency Identification

If learners are unable to monitor misunderstandings prior to receiving summative evaluations, they are less likely to effectively "bootstrap" or boost their own learning (Winne, 1997). In opposition to the self-reflective "problem shooting" behaviour that is advocated for in SRL, current assessment punishes deficiencies and rewards proficiencies. Learners are expected to monitor their cognition, develop learning strategies, and engage in help seeking behaviour with limited or no grade recognition. Why shouldn't learners be rewarded for identifying their deficiencies *as well as* displaying their proficiencies? In such a culture of assessment, obtaining desired rewards would not necessitate hiding or surmounting shortcomings independently. Instead, each step in the learning process (i.e., identifying barriers, reevaluating learning strategies, co-operative problem solving, and displaying proficiency) would be rewarded equally and learners would be able to observe direct causation between adaptive learning strategies and grade recognition.

Consider the example of a student, Jane, who understands the difference between multiplication and addition and can complete an elaborative assignment to create equations with equal value e.g., 3 x 3 = 9 and 6 + 3 = 9 (elaborative assignments are discussed in the next section). In contrast, Anne, who does not understand multiplication, has also received full marks on her activity sheet for identifying the following barrier: "If I have three apples, and then have three more, I have six. Apples cannot become more apples by using an x, so I think 3 x 3 must be six. I don't understand how apples become more apples by using x's". In this case, by rewarding Anne for accurately monitoring her current knowledge and identifying her barrier to learning, the instructor has gained important insight into a concept that Anne (and potentially others) has misunderstood. Also, an opportunity has been identified for peer tutoring between Jane and Anne.

Elaboration

The effectiveness of self-regulation is enhanced when learners are gratified through learning new information (mastery orientation) and overcoming barriers by satisfying their desire to meet preset goals (approach motivation) (e.g., Bandura, 1997; Diener & Dweck, 1978; Elliot, 2005; Elliot & Thrash, 2002; Fryer & Elliot, 2008). Effective regulators are not easily discouraged and expect that engagement in strategic and effortful practice will generate achievement (e.g., Battle, 1966; Eccles & Wigfield, 1995). In this section, I will begin by discussing research on motivation that has been found to support SRL. Next, models that depict interactions between individuals and factors that influence learning motivation will be discussed. Lastly, facilitating mastery-approach motivation through elaborative assignments and reciprocal learning will be explored.

Motivation Research

When faced with adversity, mastery oriented learners sustain or enhance effort and attribute difficulties to a lack of volition (Dweck & Master, 2008; Elliot, 2005). In contrast, performance oriented learners, motivated by the opportunity to exhibit their abilities, decrease effort, avoid challenge, and attribute difficulties to a lack of ability (Elliot, 2005). Achievement orientation refers to learners who are motivated to either achieve a positive outcome (approach motivation) or avoid a negative outcome (avoidance motivation). The literature exploring the effect of goal and achievement orientation on SRL makes it clear that adopting a mastery-approach orientation positively influences learners' abilities to engage in

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self-regulation. Mastery-approach learners are less likely to experience anxiety, negative emotion, and decreases in self-efficacy when they fail (see Bandura, 1997; Elliot & Thrash, 2002; Linnenbrink & Pintrich, 2002). As a result, they are less likely to use maladaptive regulation such as self-handicapping (externalizing reasons for failure), defensive pessimism (preparing for failure by modifying performance standards), and disengagement (Fryer & Elliot, 2008).

In contrast, performance-avoidance learners hesitate to seek help, process material at a surface level, and experience increased anxiety (Elliot, 1999; Karabenick, 2003; Linnenbrink & Pintrich, 2002). Similarly, mastery-avoidance is associated with fear of failure, avoidance of help seeking, and anxiety due to parental pressure (Curry, Elliot, Fonseca, & Moller, 2006; Elliot & McGregor, 2001; Karabenick, 2003). Although performance-approach goals have been shown to positively affect learning in the short term, they are expected to lead to decreased motivation and disengagement in the long term (Fryer & Elliot, 2008).

Individual Decision Making

Learners are theorized to develop learning motivation in accordance with multiple affective, cognitive, and physiological factors. Fryer and Elliot (2008) depict this process as a confluence between personal and environmental influences, and perceived achievement outcomes. Carver and Scheier (1998) construe this process as a hierarchical network of feedback loops. In this model, goals reside at one of four different levels; namely the system (ideal self), principle (personal value), program (activity), and sequence (movement) levels. People engage to fulfil the requirements at each level. Since levels are superordinate to one another, lower levels of control can be manipulated to fulfil a need at a subordinate level.

For example, consider a first year university student who has experienced success in chemistry at the high school level. This student is currently enrolled in first year organic chemistry (a course well known for its difficulty). Let us assume this learner is an effective self-regulator and is motivated by mastery-approach goals. As the level of difficulty in this course increases, the student can be expected to alter her study strategies, adapt her environment, and exert more effort toward her goal. The learner will then compare the results of these actions with expected outcomes. If improvement is detected the learner will either maintain or enhance these efforts until an acceptable level of proficiency is reached (potentially high school equivalent grades). However, if improvements are not detected the learner may alter her perception of science (principle level) in order to protect self-concept (at the superordinate "ideal self" level). For example, she may develop a theory that organic chemistry is not "real" chemistry and therefore does not reflect her ability as a chemist. In turn, she may adopt a more performance-avoidance stance (e.g., "I must get good grades or people will think I am a bad chemist") and engage in less adaptive strategies (e.g., self-handicapping). The importance of both cognitive and affective learning outcomes to student success has been well documented in the classroom and online learning literatures (e.g., Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Lee, Srinivasan, Trail, Lewis, & Lopez, 2011; Shepard, 2008).

To develop assignments that prevent disengagement, instructors must first understand processes by which learners decide to either forgo mastery-approach learning, or "press on" and adapt their strategies to achieve their goals. Carver and Scheier (1990, 1997) construe this process as a continuum with two key decision points. The first decision must be made when a learner recognizes a problem. The learner must decide if the problem is sufficient to impede goal attainment. If the answer is "no," the learner can use strategies to solve the problem; if the answer is "yes," the learner must assess expectancy of success. Next, the

learner must make an internal confidence judgment regarding her ability to solve the problem (Thiede, Anderson, & Therrialt, 2003). If the learner is sufficiently confident, she will continue to work towards her goal, potentially adjusting strategies, effort, or the environment. If not, she will disengage from the activity as in the previous example.

Although potentially accurate, this depiction of the decision making process is overly simple. It does not address relationships between the utility of obtaining the goal and costs involved in persisting or disengaging. A long history of research has examined relationships between expectation of success, goal value, and perceived costs (e.g., Atkinson, 1957; Battle, 1966; Eccles & Wigfield, 1995). Atkinson (1957) construed persistence as a function of anticipated success or the inverse relationship between task difficulty and the probability of success. More recently, fine-grained analyses have identified four key factors in the decision making process: attainment value (value of completing the goal); intrinsic value (anticipated enjoyment or personal satisfaction); utility value (anticipated positive relationship between this goal and an important end goal); and cost (anticipated negative consequences of obtaining or failing to obtain a goal) (Eccles & Wigfield, 1995). Although each of these factors has been shown to predict behaviour, the relative weight and importance of each factor is dependent on goal proximity and domain (Eccles & Wigfield, 1995).

Elaborate Reciprocal Assignments

In accordance with these models, if learners are to conserve, or obtain, a mastery-approach orientation they must believe they have the tools required to reach previously negotiated goals. Moreover, learners must believe that the task has sufficient value to mitigate its implicit costs. The CREATE model assumes that reconfiguring learners' perceptions of "success" gradually enhances learners' perceived capacities to succeed. Defined as manipulating course materials to present a "correct" answer, some learners may feel that they do not have the requisite abilities or resources to provide an answer. However, defined as identifying barriers, developing action plans, and finding solutions, success may be viewed as more attainable. By placing equal value on quality questions *and* answers, learners are rewarded for both finding problems and solutions, and therefore should feel that they have the tools required for success. Lastly, if learning is desired, and goals are sufficiently internalized the costs of learning will be mitigated by its value.

For learners, the first step in this process is to parse out components of a task perceived to be understandable, questionable, or unattainable. Black et al. (2004) suggest a traffic light technique where tasks are labelled as green (attainable), yellow (questionable), or red (unattainable). Secondly, each of these categorizations will be addressed individually. Learners will answer green (attainable) problems in full. They will complete as much of each yellow problem as possible while also identifying specific information required for a full answer. Finally, learners who do not have the capacity to provide any part of the answer (red question) will provide an in-depth description of the confusing component(s) of the problem(s), plausible information required for the solution, and an action plan for obtaining the required information (as exemplified by Annie's comments earlier). As previously discussed, grades assigned for each of these options would be weighted equally.

In the CREATE model, it is suggested that elaborative techniques are employed for evaluating process goals. Tasks requiring that products are developed through the analysis of information are referred to as elaborative learning techniques. Traditionally, elaborative strategies such as self-questioning, self-explanations, argumentation, and summarization have been widely supported as effective techniques for study (e.g., Bretzing & Kulhavy, 1979; de Bruin, Rikers, & Schmidt, 2007; King, 1992; Palinscar & Brown, 1984; Whilhelm & Pieters, 2007). However, elaborative techniques are not only endorsed as mechanisms of study in the

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current model, but also as the means for both summative and formative testing. Learners are provided with a framework for creating and/or reflecting upon green, yellow, and red learning products by using elaborative techniques for assessment. To provide an example of how elaborative techniques may be used, a four stage cyclical relationship between learners and content is presented in Figure 1.

In the first stage of this model, the communication stage, learners are required to probe new information to develop learning products (e.g., questions, arguments, summaries). In the second stage, reflection, learners are required to create a written reflection on these products. This reflection could include the answer (or a combination of the answer and previously described barriers), reflection on an argument (e.g., misguided information), reflection on a summary (e.g., missing information), etc. In the third stage, learners exchange their products of learning with their peers. Peers are required to reflect on products of learning using the methods described in the second stage. In the fourth stage, learners in a group environment compare and contrast their constructed knowledge and prepare for final group submission to the instructor. Lastly, co-constructed questions then can be pooled and used for final assessment. In this way, peer tutoring, with instructor facilitation, ensures that all assessment items have been dispersed within the class. Moreover, learners can be confident that they are well versed in the content of the summative assessment.

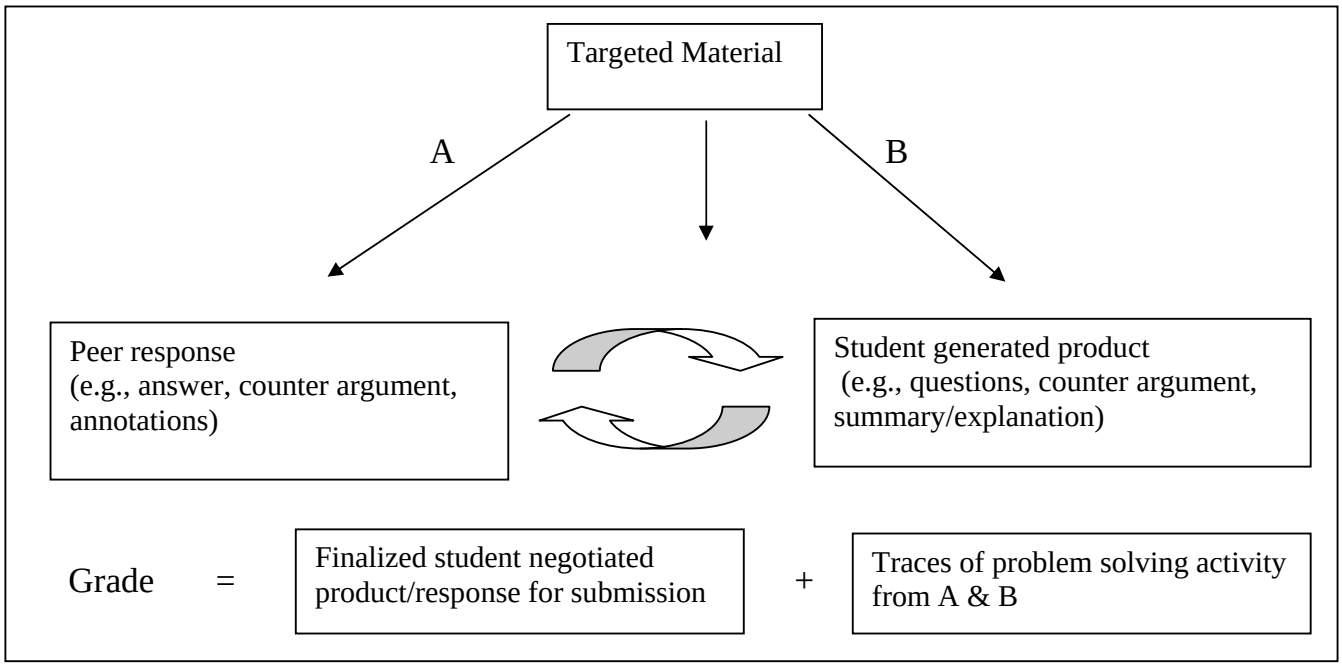

Figure 1. Example of process based assessment.

The model presented in Figure 1 is provided as an example of how elaborative learning can be used in assessment. However, it is not intended to be the only, or the best way, to conduct assessment in every situation. For example, the instructor may prefer to provide pre-developed questions that concentrate on specific concepts crucial to the unit. In this case, the learners would not be required to develop a product of learning. However, by providing learners with the opportunity to obtain rewards for identifying barriers and potential strategies, even traditional teach-study-test methods become elaborative. Most importantly, a SRL culture is nurtured that accepts and rewards the creation and refutation of knowledge as a valued component of learning.

Attribution

The analysis thus far has advocated for a curriculum that encourages setting multiple proximal goals, rewards for goal procurement, and assessments focused on the process and not the product of learning. However, to develop a curricular culture such as this, learners must attribute their success and failure to controllable-internal factors (Weiner, 2005). For example, if Jane perceives that intelligence is predetermined (entity theory) she may feel that the value of finding barriers and solutions are mitigated by the costs. Thus, she may be less engaged in elaborative assignments (Molden & Dweck, 2006).

Weiner (1979, 2005) identified three categorizations of learning attribution: (a) internal or external locus (self or other), (b) controllable or uncontrollable, and (c) stable or unstable (see Table 1).

Table 1
Weiner's Classification of Attributions

	Internal		External	
	Stable	Unstable	Stable	Unstable
Controllable	Attitude	Strategy	Teacher Bias	Assistance
Uncontrollable	Ability	Mood	Task Difficulty	Luck

Note. Adapted from Schunk (2008, p. 248).

Research indicates that both ability (uncontrollable, internal and stable) and effort/strategy (controllable, internal, and unstable) attributions on the part of an instructor improves self-efficacy. Ideally, instructors should begin by attributing success and failure to effort, but switch to ability attributions as learners master the content (e.g., Schunk, 1994, 2008; Schunk & Cox, 1986; Schunk & Gunn, 1986). It is important that students are challenged such that effort is *required* for success. If this is not the case, attributions may be perceived as invalid and not be accepted by learners as a realistic reflection (Schunk, 2008). The attributions learners make must be considered carefully as they affect how learners perceive academic causation. Learners who attribute failure to internal factors that are controllable and unstable (e.g., effort, strategies) may experience some guilt or sadness, but are less likely to have diminished future expectancy (expected future performance) and self-efficacy (Schunk, 2008; Weiner, 2005). However, learners who attribute failure to internal or external stable factors experience increased anxiety and decreased self-efficacy (Schunk, 2008). Potentially the most important role of an instructor is to attribute success and failure to factors that can be manipulated by learners. Moreover, attributions of "intelligence" should be coupled with an emphasis of the learning process as a causal factor (e.g., Dweck & Master, 2008; Schunk, 2008; Weiner, 2005).

Most attribution research has focused on developing positive learner attributions. However, a recent chapter by Weiner (2005) discusses the importance of shifting attention to the attributions instructors make that are not disclosed (directly) to their learners. Weiner suggests attribution research should be less concerned with

> the psychology of the competent or incompetent person, but rather the psychology of others viewing that individual. My answers to the question of what competence predicts, as suggested in this chapter, are whether others are envious of this individual; whether he or she elicits sympathy, contempt, anger and/or admiration when succeeding or failing; whether he or she is regarded as arrogant or modest; whether the individual is liked or disliked; and so on. (p. 83)

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Although most instructors are competent and caring professionals, it is essential that they also question their own perceptions and attributions, which they either internally or externally impose on learners. Schunk (2008) indicate that instructors tend to provide sympathy if failure is seen as uncontrollable and stable, and anger if it is seen as controllable and unstable. To ensure that learners make controllable, internal, and unstable attributions for failure, it is essential that instructors appropriately attribute success and failure based on "objective" controllable learner attributes. Activities such as providing sympathy grades or attributing success to natural intelligence serve to reinforce entity theory, promote learned helplessness, and take away from learners' perceptions of control (e.g., Dweck & Master, 2008; Meece & Painter, 2008; Schunk, 2008).

The theme advocated so far in this paper will continue here. Allowing learners to learn within a curriculum organized to reflect the essential stages of SRL will facilitate the development of effective learning strategies. Learners in the CREATE paradigm are encouraged to attribute success to meeting incremental process goals such as identifying barriers, creating strategies, asking questions etc. This structure alone is expected to facilitate internal and unstable attributions for success and failure. Instructors in the CREATE paradigm are also encouraged to reflect on their own theories of knowledge, and adjust any entity theories they may be inadvertently imposing on their learners. Instructors are invited to champion an SRL culture that ties attributions of success to consistent progress and the implicit value of obtaining new knowledge.

Tune and Evolve

Expert teachers are characterized as being flexible and having the ability to react effectively to changing circumstances within a classroom (Berliner, 2001). The CREATE model provides instructors with tools required to make adjustments to learning processes. Instructors are encouraged to actively tune their goals, expectations, and strategies based on the needs of their learners. This is an opportunity for instructors to allow their curriculum to become a living entity, one that is regulated and adjusted based on the needs of its community. According to Zimmerman and colleagues (1989, 1997, 2002), students and particularly elementary school students, learn from and emulate models of learning, that are modelled by peers. Instructors within the CREATE paradigm provide the environmental and emotional scaffolding students need to regulate their learning in an open and caring atmosphere. Along with providing a climate of autonomy that promotes intrinsic task interest, CREATE provides an opportunity for instructors to model effective SRL for their learners.

CREATE is most accurately seen as an evolving curriculum. As learners become more competent and confident as self-regulating learners, potentially more advanced elaborative assessments can be given. Instructors may be able to monitor peer and self-assessments less closely, and the learner may be required to provide more specific and in-depth accounts of their learning challenges. In this way, learners can improve SRL skills in coordination with, and not in spite of, the curriculum.

Conclusion

The ideas presented in this paper are not new. In fact, most of them have been researched, discussed, and written about for decades (if not centuries). In stride with previous literature the CREATE model attempts to improve learner self-regulation through instructional techniques, assessment, learning strategies, and indicators of SRL. However, unlike previous literature CREATE concentrates on developing a curricular culture that mirrors self-regulatory processes acknowledged to enhance and guide learning. The

CREATE culture defines learning and competency as the ability to understand, correct, and reflect, *not* as the ability to regurgitate didactic facts and figures. The existing tendency of rewarding success and punishing failure is challenged in exchange for redefining learner success as the ability to identify and respond to both.

An important aspect of the CREATE model for teaching and learning is that it is recursive. This is essential as it mirrors SRL, which is also recursive in nature. Like a self-regulating learner, teachers' implementation of curriculum must include negotiated goals and attribute successes to effective participation in the learning process. Most importantly however, it must reflect on its successes and failures, and adapt strategies based on the lessons that are learned. In this way, learners who become part of this culture have the opportunity to emulate and model skills needed for SRL. If we can accept the axiom that learning "begins with the master, and ends with the self," instructors and curricular designers have both a great opportunity and responsibility to incubate learners in a co-regulating and flexible learning environment. In this sense, the education system may look to the business world where corporate culture is often seen as the key to success or failure. As Nalman (1998) explains:

> [c]reativity in the workplace must be nurtured and cultivated for it to flourish. This means creating a culture of trust and having the freedom to express new ideas without being ridiculed, allowing room for mistakes, and developing the radar to spot opportunities in unexpected places (para. 49).

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