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Beyond Student-Centered and Teacher-Centered Pedagogy: Teaching and Learning as Guided Participation

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Beyond student-centered and teacher-centered pedagogy: Teaching and learning as guided participation

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Abstract. In recent decades, student centered pedagogy has provided serious challenges to traditional "lecture-and-test" modes of education in colleges and universities. Advocates of student-centered pedagogy generally proceed from the constructivist position that maintains that learners construct their understandings through their actions and experiences on the world. Student-centered thinking has spawned a burgeoning interest in the use of a variety of different active learning methods in and out of the classroom. These include collaborative learning, experiential learning, problem-based learning, and a variety of other pedagogical methods. However, the theory and practice of student-centered pedagogy is not without its problems. "Student centered" learning is often defined in contradistinction to "teacher-centered" pedagogy. The idea that students must be active in the construction of knowledge is often understood to imply a diminishing role for the teacher in the learning process. Teachers are called upon to relinquish singular claims to authority or power in the classroom. As a result, the role of the teacher becomes recast as one of "coach" or "facilitator". In this paper, I argue that the student/teacher-centered dichotomy is built upon a false premise -- namely that it is possible to parse off the active role of the student from the socio-cultural activities of which the student and teacher are a part. An alternative approach is based upon the socio-cultural-constructivist idea that learning is a form of *guided participation* in socio-cultural activity. From this view, knowledge in any given discipline is the historical product of socio-cultural processes that have evolved over long periods of time. Such knowledge is preserved and communicated through the cultural vehicle of language. It follows that learning within any given discipline requires mastery of the language-based meanings that define disciplinary knowledge and practice. Such knowledge can only be acquired through active participation in language-mediated learning activities that are structured by more expert individuals. All learning is thus viewed as a form of doing. Pedagogy becomes a task of articulating learning goals and identifying the forms of doing that promote development toward those goals.

I.

Much has been written on the distinction between traditional "teacher-centered" and progressive "student-centered" pedagogy (Cicchelli, 1983). Although much of this work has

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been elaborated in the context of primary and secondary education, these concepts have also been influential within college and university settings (Barrett, Bower & Donovan, 2007; Laverie, 2006; Lord, 1999; Barber, 2007; Umbach & Wawrzynski, 2005). The distinction between learner- and teacher-centered pedagogy is often made with reference to the distribution of expertise and authority in the classroom. Traditional teacher-centered pedagogy is generally defined as a style in which the teacher assumes primary responsibility for the communication of knowledge to students. From this view, because teachers command greater expertise about the subject matter, they are in the best position to decide the structure and content of any given classroom experience. Teacher-centered pedagogy is usually understood to involve the use of the lecture as a primary means of communication in the classroom. The goal of the classroom involves the dissemination of a relatively fixed body of knowledge that is determined by the teacher. The lecture format is generally assumed to proceed in a unilateral fashion; the teacher elaborates upon a given body of knowledge from his or her own expert perspective rather than building the content of classroom communication around questions that students might have. Drawing upon Cicchelli (1983), Hancock, Bray and Nason (2003) define teacher-centered instruction as follows:

> The teacher (a) is the dominant leader who establishes and enforces rules in the classroom; (b) structures learning tasks and establishes the time and method for task completion; (c) states, explains and models the lesson objectives and actively maintains student on-task involvement; (d) responds to students through direct, right/wrong feedback, uses prompts and cues, and, if necessary, provides correct answers; (e) asks primarily direct, recall-recognition questions and few inferential questions; (f) summarizes frequently during and at the conclusion of a lesson; and (g) signals transitions between lesson points and topic areas (p. 366).

Teacher-centered pedagogy is often described as being based upon a model of an active teacher and a passive student. In contrast, learner-centered education is based upon the idea of an active student. From this view, the teacher does not function as the primary source of knowledge in the classroom. Instead, the professor is viewed as a facilitator or "coach" who assists students who are seen as the primary architects of their learning. Hancock, Bray and Nason (2003) describe learner-centered pedagogy as follows:

> (a) teachers are a catalyst or helper to students who establish and enforce their own rules; (b) teachers respond to student work through neutral feedback and encourage students to provide alternative/additional responses, (c) teachers ask mostly divergent questions and few recall questions, (d) students are allowed to select the learning task and the manner and order in which it is completed, (e) students are presented with examples of the content to be learned and are encouraged to identify the rule of behavior embedded in the content. (f) students are encouraged to summarize and review important lesson objectives throughout the lesson and the conclusion of the activity; (g) students are encouraged to choose new activities in the session and select different topics for study, and (h) students signal their readiness for transition to the next learning set (pp. 366-367).

Student- or learner-centered education has its origins in constructivist developmental theory (DeVries, & Kohlberg, 1997; Fosnot & Perry, 2005; Kolb, 1984; Piaget, 1948/1973) and in the progressive education movement in the early part of the 20th century (Dewey, 1938). Constructivism refers to the idea that individuals *construct* their understanding of the world as a product of their *actions* on the world. Piaget's theory of cognitive development is perhaps the best known of constructivist approaches to development. Piaget's theory of knowledge construction stands in opposition to both rationalist and empiricist approaches to the

acquisition of knowledge. Rationalist approaches maintain that knowledge is either innate property or a logical product of the mind (Chomsky, 1980; Descartes, 1641/1993; Fodor, 1975). Empiricist approaches hold that knowledge is acquired from sensory experience (Hume, 1777/1993; Locke, 1689/1996). In contrast to rationalist approaches, Piaget held that knowledge is constructed over time by acting on the world. In contrast to empiricism, Piaget argued against the idea that knowledge and perception constitute mere copies of things seen or experienced. For Piaget, to know the world is to be able to organize it in terms of existing knowledge. One cannot learn anything acontextually; to know an object is to be able to assimilate it to some existing way of knowing. Without the capacity to assimilate objects with existing knowledge, there would simply be no way to make sense of the world.

Figure 1 depicts the contrast between empiricist and constructivist approaches to perception and knowledge acquisition. The left panel describes the empirical approach to perception as advocated by the British empiricists (Locke, 1689/1996; Hume, 1777/1993). From this view perception is understood as a relatively passive process. Perception begins with sensory input from objects in the world. Patterns of sensory data are received by sensory receptors, which mediate the process of creating an internal idea, image or copy of sensory impressions. Knowledge is not simply confined to sensory impressions. Locke (1689/1996) for example, elaborates in detail on the ways in which complex ideas develop gradually from the repetition of multiple simple sensory impressions. Nonetheless, although empiricism postulated mechanisms for the creation of complex ideas, such ideas have their origins in sensory impressions themselves. The arrow of perception moves in a single direction – from the object to the percept.

The right panel of Figure 1 depicts Piaget's (1952) constructivist conception of perceiving and knowing. Unlike the empiricist model, the person is considered to be active in the process of perceiving. Perception is not a passive process of simply receiving sensory input. Persons act on their worlds through the application and coordination of existing ways of knowing. For example, the process of perceiving a cube is not a simple matter of registering a fixed pattern of sensory input emanating from the object. Instead, it requires multiple acts of viewing the cube

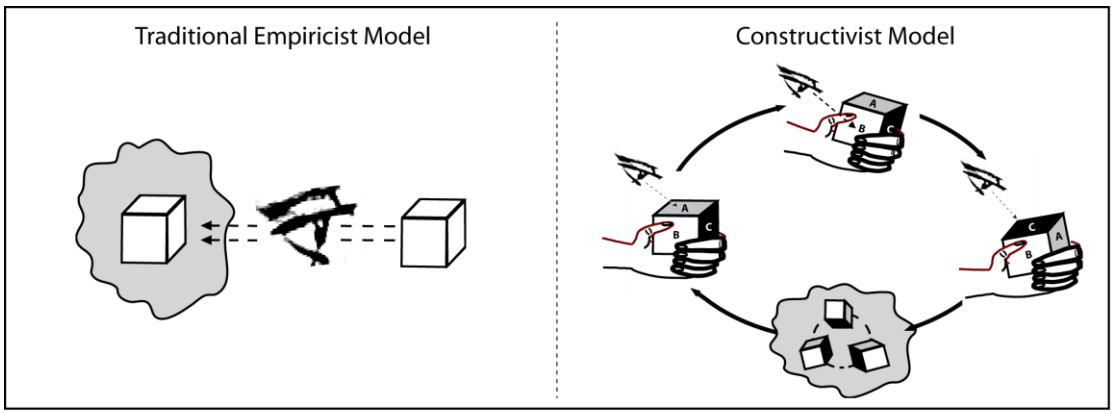

Figure 1. ***Empiricist and Constructivist Models of Perception.*** In the traditional empiricist model, knowledge and perceptions are viewed as the results of sensory experience. The person is not depicted as active in the process of organizing sense impressions. Perception starts with the real cube existing in the world. Sensory data from the cube is received by the eye. Knowledge of the cube is seen as an internal representation or copy of the really existing cube. Perception is viewed as a process that moves from the environment to the person. In the constructivist model, perceiving and knowing are considered active processes. Persons are not simply recipients of sensory experience; instead, perceptions and knowledge structures are constructed through the process sensing and acting on the world. The process of perceiving a cube involves multiple acts of looking, touching, turning and exploring the cube. Any single act proceeds from a single perspective and gives only partial knowledge of the cube. Sensorimotor feedback gained from acting on the cube from a myriad perspectives is coordinated into an integrated knowledge structure. It is through the application of integrated knowledge structures that we are able to go beyond the information given in perceiving the cube from any single angle. Such knowledge structures are constructed over time and allow us to see and know the cube as a single whole, rather than as a set of independent viewings.

from a variety of different angles and coordinating each organized perception into an integrated whole. Each act of viewing the cube involves the integration of many sensory modalities – (e.g., looking, moving the head and hands, seeing and feeling invariant patterns of movement of the body and of the cube in time and space). The product of the coordination of multiple such actions-on-objects is the capacity to construct an integrative representation of the entire cube. This is not an insignificant point. When viewing a cube from any single angle, we are only exposed to a part of the cube. However, we apprehend the entirety of the cube; we fill in the absent sides of the cube in conceiving the cube as a whole. In this way, our concept of a cube is a construction; it goes beyond the information given in any single view of the cube.

One can readily identify the origins of the concepts of teacher-centered and student-centered education in these philosophical positions. Consistent with the empiricist model of knowledge in which knowledge has its origins in the senses, the teacher-centered approach begins with a body of knowledge that exists independent of the individual student. The teacher is viewed as the primary expert on the body of knowledge in question. Teaching occurs as the knowledge is transmitted from the teacher to the student. The conduit metaphor is often used to describe the practice of teacher-centered education. Like a conduit, the task of the teacher is to move a relatively fixed body of knowledge from the mind of the teacher (or text) to the mind of the student. From this view, to teach is to *give* (e.g., give a lecture); to learn is to *take* (e.g., take notes; acquire knowledge). A teacher has taught the course *material* if he or she has *given* the lecture; a student has *received* the material if he or she has *taken it in*. Because knowledge is viewed as being transmitted cumulatively from the teacher to the student, there is no need to take into consideration the knowledge structures of the individual student. The student simply receives the material transmitted by the teacher.

The conduit metaphor of teaching portrays the learning process as one of *accumulating* knowledge. In contrast, the constructivist approach maintains that learning involves the transformation of existing knowledge into increasingly higher-order forms. It is not possible to learn anything totally anew; all new knowledge develops out of existing knowledge. Piaget (1985) invoked the concept of *equilibration* to describe the process by which individuals construct knowledge and skills. Piaget held that all knowledge has structure. Piaget suggested that knowledge is organized into *schemes* or *cognitive structures*. Any given act of knowing involves the assimilation of a to-be-understood object into existing knowledge structures as well as the simultaneous attempt to accommodate or adjust one's knowledge structure around the new experience. In this way, novel aspects of experience are understood in terms of existing ways of knowing. The possibility of learning occurs when a person encounters novel experiences which cannot be readily understood in terms of existing knowledge structures. The resulting cognitive conflict (or *disequilibrium*) motivates the learner to rebuild existing knowledge structures in order to accommodate the novel experience. Genuine learning occurs when individuals are able to transform existing knowledge into higher-order modes of thinking that resolve the conflict and contradictions engendered by the experience of novel events.

The constructivist approach has important implications for teaching and learning. If individuals construct their understanding of the world through action, then there is no way to simply "teach" or "give" students knowledge. All new knowledge is constructed on the basis of existing knowledge. As a result, any attempt to teach a novel concept must take into consideration the student's existing ways of understanding the domain in question. A good teacher is one who is able to engage the student's existing ways of knowing and introduce novelty in such a way as to prompt transformation in the structure and content of a student's knowledge and skills. Further, if students construct knowledge through action, then it becomes important to provide students with an opportunity to engage in the types of action that will allow them to *construct for themselves* the knowledge at hand. From this view, to learn is to invent; if students are to engage in genuine learning, they will have to perform the actions that will lead to deep

understanding of the concepts in question. Because students will always assimilate novel experience according to their existing knowledge and developmental level, a teacher can never directly teach new concepts. The best that a teacher can do is to provide students with learning opportunities and direction. The constructivist teacher thus relinquishes his role as the expert or focal point in the classroom. Instead, he operates as a facilitator or coach who designs learning activities through which students will create organized structures of knowledge.

II.

Beyond the Student-/Teacher-Centered Dichotomy

The constructivist challenge to teacher-centered pedagogy is an important one. Consistent with the constructivist approach, a large and growing body of literature supports the proposition that active student engagement in the learning process produces higher quality learning than the traditional lecture and testing approaches used in the United States (Sharan, 1990). However, there are nonetheless serious issues that can be raised about student-centered conceptions of learning and development. These include the tendencies (a) to promote active student engagement at the expense of active teaching; (b) to privilege individual experience over linguistically-mediated cultural knowledge in the development of higher-order knowledge; and (c) to confuse desired *outcomes* of education with the *developmental processes* that lead to those outcomes. In elaborating upon these issues, I will argue that the student-centered/teacher-centered dimension constitutes a false dichotomy in educational theory and practice. Throughout this section, in addressing these issues, drawing upon both socio-cultural and constructivist ideas, I will elaborate a general *structured action* conception of teaching and learning.

The Role of the Teacher

Student-centered pedagogy is generally defined in terms of the source of power and authority in the classroom. In drawing on the constructivist idea that children must be *active* in *constructing their own understandings* of the world, learner-centered pedagogy has emerged as an attempt to stimulate and support the constructive activity of the student. Often, however, the goal of fostering the active construction of knowledge by the student is understood against the backdrop of a weakening of the role of the teacher in pedagogical activity. However, the idea that students must actively construct their skills and understandings *for themselves* is not the same as suggesting that children must actively construct their skills and understandings *by themselves*. Conceptions of teachers as mere "facilitators" or "coaches" whose function is to support a student's active attempts to discover and reconstruct knowledge through their own actions relinquishes the central role of teachers in the pedagogical process. This point can be illustrated with reference to Vygotsky's (1978) concept of the *zone of proximal development*. Vygotsky maintained that there is a difference between the developmental level at which a child can function when working on her own and the level that she can sustain while working with an adult or more accomplished peer. Vygotsky (1978) referred to the distance between these two levels as the zone of proximal development. Social interactions that occur within the zone of proximal development pull the less expert partner's functioning to levels that are higher than that which he is capable of sustaining alone. Learning occurs as less expert social partners appropriate and reconstruct higher-order knowledge and skills that have their origins in the child's participation in social interaction with others (Rogoff, 1993). A child cannot ordinarily create the zone of proximal development by himself; he needs the more expert individual to bridge the gap between his current developmental level and his proximal level of development (Mascolo, Fischer & Pollack, 1997).

None of this is to suggest that the goal of promoting active engagement of individual students is not an important one; on the contrary, it is *essential*. It *is* to say, however, that for the vast

majority of students of all ages, the goal of promoting active engagement cannot occur in the absence of authoritative teachers who play a central role in organizing the structure, content and direction of a student's learning. Wood, Bruner and Ross (1976) invoked the concept of *scaffolding* to refer to the processes by which more accomplished others assist, direct and otherwise support a learner's active attempt to construct new knowledge (see also Gauvain, 2001; Rogoff, 1990; Stone, 1998). In dyadic and small group activity, scaffolding occurs when the more expert partner in a learning activity directs the learner, breaks down a task to make it more manageable, supports the deployment of a learner's attention, helps to manage frustration and so forth. As learners master the elements of a given task and gain the capacity to perform a given task independently, the scaffolding can be attenuated and ultimately removed. At this point, the more expert partner can "up the ante" in order to prompt students to function at still higher levels (Rogoff, 1990). In this way, the process of scaffolding is an interactive one (Mascolo, 2006); the more expert partner adjusts the level of support provided with reference to her sense of the developmental needs of the child.

Mascolo (2005) described a series of different forms and levels of social scaffolding that more expert partners typically use in supporting a learner's development. These forms and levels are depicted in Table 1. There is a broad range of processes by which more expert individuals can support the learning and development of less accomplished social partners. As indicated in Table 1, the lowest levels of scaffolding occur when more expert individuals simply prompt or remind a child to perform an already mastered action; provide emotional encouragement or frustration management for ongoing activity; or use language to restate or expand a child's utterance. A particularly effective form of scaffolding involves *distancing* (Sigel et al., 1993). Using distancing strategies, a more accomplished partner asks questions or makes statements that prompt constructive activity on the part of the learning in a particular direction.

Distancing strategies create "distance" between a learner's current developmental level and his or her possible developmental level. For example, a young child might ask, "What makes it night?" In response to this question, the relative expert might ask, "What is different about the day and the night?" Such a question prompts novel constructive activity on the part of the child.[2] The highest levels of scaffolding occur when more able partners actively direct a novice partner's actions and thoughts. This can occur with direction (including lectures), modeling and imitation, or even physical guidance. Effective scaffolding occurs as more able partners adjust the level of support and direction that they provide to the anticipated needs of a less able partner (Azevedo, Cromley, Seibert, 2004; Cromley & Azevedo, 2005; Rodgers, 2004) and promote deep engagement of the student in the learning process (Chi, Siler, Jeong, Yamauchi, & Hausmann, 2001).

Language and the Cultural Origins of Higher-Order Knowledge and Skills

A second issue concerns the constructivist assumption that students construct knowledge as a process of reflecting on personal or collective *experiences* that result from their explorations of the world. Whether through independent processes of exploration and discovery or collective processes of collaboration and dialogue, students can construct new principles (e.g., scientific laws; mathematical regularities; psychological principles) through systematic exploration and reflection on their experiences. This proposition is not so much erroneous as it is incomplete. Although active exploration and reflection are essential for learning, the idea that students themselves construct knowledge through undirected experience fails to appreciate the *mediated*

[2] Distancing statements are very different from questions to which students already know the answer. The latter types of questions fail to promote constructive activity, whereas the former promote representational development (Sigel et al., 1993).

Table 1
Forms and Levels of Social Scaffolding

Type of Scaffolding or Support	Example
1. Encourage/Prompt. Student already has the requisite skill and understanding, and is responsible for deploying the skill by him or herself. More expert partner simply provides encouragement, prompts, reminders, or praise without specific direction or instruction.	Aware that a student is able to perform a given task (e.g., develop a particular ine of reasoning, identify the proper statistical test), professor reminds or prompts appropriate response or action.
2. Sequential Direction-and-Independent-Action. More expert partner explains concepts or models target operations. Afterward, novice performs task *without* further assistance or support from the expert during student's execution (compare to Level 6). Student responsible for performing task independently after expert explanation.	Lecture and test. Multiple revisions of resubmitted papers or projects following feedback. Distance learning involving sequential direction and response (e.g., paper revisions using email correspondence)
3. Asymmetrical Assistance. Expert supports child's action by breaking down the task, performing part of the task or otherwise providing support so that the novice can complete the rest of the task (without distancing or higher-level scaffolding).	Professor breaks assignment into smaller chunks; expert performs higher order statistical operation (e.g., factor analysis) so student can perform a lower level one (e.g., interpret factor loadings).
4. Distancing. Expert creates cognitive demand on novice, motivating constructive action in a particular direction. Distancing motivates but does not specify a student's representational activity. Examples include requests for evaluations, inferences, comparisons, open-ended questions, probes and Socratic dialogue.	In response to a student's question, "Is the capacity to walk genetically determined?" professor prompts further reflection by posing conflict-inducing question like, "Can a child acquire the capacity to walk without effort?"
5. Direction. Expert provides explicit and specific directions about how to perform an action or procedure, or explains to-be-acquired meanings as in lecture. Novice follows directives, appropriates explanation, takes notes, etc.	Any form of direction, explanation, direction, etc. Lecture and note taking; modeling a statistical calculation while students watch and ask questions, etc.
6. Concurrent Direction for Student Action. Expert provides direction and guidance while the student is in the process of performing a given task. Student adjusts action concurrently to expert's guidance.	More expert partner directs and guides student through the process of writing a passage, developing a line of thought, performing a statistical test, etc.
7. Concurrent Physical Guidance for Student Action. More expert partner uses hand-over-hand guidance, physical contact or highly directive gestures to direct a student's attention or actions.	Instructor points to each word in a complex passage to support reading; uses hand-over-hand guidance to demonstrate use of complex equipment.

nature of higher-order knowledge and skills (Mascolo, 2004; Wertsch, 1998). Academic knowledge and skills are historical products of *culture* and are represented and communicated through the social vehicle of *language*. As products of culture, the knowledge and skills of any discipline – mathematics, literature and the natural and social sciences – evolved over centuries of intellectual exchanges between and among scholars. The intellectual products of any given discipline are not natural objects whose properties can be explored and identified through unmediated experience. Learning mathematics requires that students master the use of a system of signs and procedures for manipulating representations of quantity. Learning sophisticated ways of reading and writing requires that students master a set of linguistically structured distinctions, norms and procedures for understanding and producing text within particular writing genres. Similarly, acquiring skills and knowledge within the discipline of psychology requires that students develop an understanding of intra- and inter-disciplinary knowledge and skills, all of which are historical products of disciplinary activity.

Such technical knowledge is represented and communicated through the vehicle of language. Language is a special vehicle of culture, communication and thought. Unlike other symbol

systems (e.g., images, pantomime, art), signs (e.g., words) have special properties. Using words, humans can represent essentially arbitrary systems of shared meanings that would be otherwise impossible to construct outside of the province of language. Unlike images or symbols, words have the capacity to represent *shared* social meanings that are relatively arbitrary. For example, people will disagree about the meaning of a picture of a voting booth; however, anyone who is facile with the use of the English language can immediately understand the consensual meaning of the term *democracy*. Further, the concept of *democracy* is a social category with a relatively arbitrary (rather than natural) meaning; one cannot learn the meaning of the term *democracy* by observation alone. Instead, one must be learn the conventional meaning and use of this term through discursive interactions with others who understand its meaning. When a student grasps the meaning of the term *democracy*, she can use it to mediate her own thinking about government. In this way, a learner's conception of democracy is not a product of individual construction; it requires the capacity to make contact with and gain facility with linguistically-mediated cultural knowledge.

To the extent that this is so, it follows that the skills and understandings that students acquire in any domain of higher-order learning must be structured with reference to the linguistically-mediated knowledge and skills that constitute disciplinary activity. Students cannot simply construct disciplinary knowledge through their own action without being informed by more expert others. This is because disciplinary knowledge is *mediated knowledge*. Language is the living and evolving repository of cultural, social and scientific meaning; it is the vehicle through which shared knowledge is created, communicated and transformed. Disciplinary knowledge and skills are the results of long histories of collective cultural and scientific activity, the products of which have been deposited in the particular sign systems (words) that mediate disciplinary activity. Thus, mastering a discipline requires learning to understand and use the language and other semiotic means through which disciplinary knowledge and processes are defined, communicated and acted upon. As a result, acquiring disciplinary knowledge requires some sense of "getting it right". It is the teacher who is charged with the responsibility of orienting students so that they may position themselves with reference to the knowledge, values, and conventions of a given disciplinary or interdisciplinary matrix[3].

Differentiating the Starting Points and Endpoints of Development

An important goal of student-centered learning is to promote active, self-directed and life-long learners. Student-centered approaches often work to actualize this goal by creating conditions in which students are granted a higher degree of autonomy in the classroom. For example, Sharan and Shaulov (1990) write, "minimizing opportunities for pupils to influence the learning process and to exercise personal control over their own work. Self-regulation, the power to make decisions affecting one's own work…are considered to be critical components of high level motivation in respect to carrying out learning tasks" (p. 175). Rice (2006) writes, "it is now widely acknowledged that faculty no longer have full responsibility for the transfer of knowledge" (p. 19). In a review of high school students' access to student-centered pedagogy in science, Smerdon, Burkam and Lee (1999) identified student-centered programs as those that involve "making their own choice of science topics to study, designing and conducting their own experiments, and making up methods to solve science problems" (p. 7). Warren (1997) holds that "students should take on primary responsibility for learning factual information so that class time can be liberated for other issues" (p. 17). Barrett, Bower and Donovan (2007) maintain that student-centered pedagogy reflects "a method of instruction in which authority for curriculum formatting is jointly shared by the learner and practitioner" (Conti, 1985, p. 7,

[3] This is so even if a professor rejects the tenets of disciplinary activity. If some aspect of a discipline is rejected, the professor must have reasons for doing so, and thus acts with some sense of what he or she considers to be appropriate.

cited in Barrett, Bower & Donovan, 2007, p. 38). Such ideals run the risk of misidentifying the intellectual and motivational *endpoints* of development as the *processes* that promote progress toward those endpoints. The student-centered ideal of granting students greater autonomy over their learning misidentifies the desired endpoint of education (i.e., autonomous, self-directed learning) as the educational process itself (i.e., granting students autonomy). Such thinking is based upon the assumption that autonomous learning develops from granting students autonomy over their learning; that self-regulated learning develops from having students exercise choice over their learning tasks; that students will acquire the motivation for scientific exploration by granting them autonomy over what aspects of science to study.

A problem with this line of thinking is that active, autonomous self-regulated learning should be the *outcome* of development; yet it is not the starting point of development (Mascolo, Finke & Fischer, 2002). If educators wish to promote self-directed learning, one must first address a series of developmental questions: What do we mean by *self-regulated learning*? How does the capacity for *self-regulation* develop? With regard to the first question, self-regulation cannot be properly defined as the "power to make decisions affecting one's work" (Sharan & Shaulov, 1990, p. 175). Such power is easily achieved simply by granting students the right to make such decisions. Instead, self-regulation refers to the capacity to bring one's thinking, feeling and acting into correspondence with internalized standards (Kopp, 1991). An enormous developmental literature exists that addresses the question of how the capacity for self-regulation develops. The overwhelming finding derived from hundreds of studies stipulates that the capacity to control one's thoughts, feelings and actions moves *from other-regulation to self-regulation*. This general finding is found over and over again in a variety of different intellectual, social and emotional domains, including the development of behavioral self-regulation (Fox & Calkins, 2003), the capacity to delay gratification (Ayduk, 2007); the development of emotional regulation (Schore & Schore, 2008); attachment and the development of social competence (Sroufe, 1996); rule internalization (Kochanska, 2002), and the development of everyday and academic skills (Wolters, Pintrich & Karabenick, 2005). These findings suggest that the capacity for effective self-regulation develops to the extent that parents adjust their attempts to promote, explain and enforce rule-related behavior to the emotional and intellectual characteristics of children. Self-regulation develops within relationships with active, guiding and authoritative adults; it does not arise spontaneously from within the developing individual.

IV.

Guided Participation: An Integrative Conception of Teaching and Learning

Rogoff (1990, 1993, 1995) invokes the concept of *guided participation* as a general framework for thinking about teaching and learning. The concept of guided participation proceeds from the idea that learning is neither a teacher-centered nor a student-centered process. For Rogoff (1993), all learning takes place within the context of socio-cultural activities. The concept of participation goes beyond the idea that students must be active in their learning. Instead, the concept of participation stands in opposition to any conception that separates the learner from the social and cultural processes of which he or she is an integral part. Regardless of the form of teaching involved, novices learn by performing activities that occur within cultural contexts. Lectures and tests, cooperative learning, experiential learning, apprenticeships, and independent reading are all culturally organized activities in which students *participate*. A person does not start off life as an individual and then come to be part of a culture; instead, persons step into and act within already existing socio-cultural process. Their participation in these activities provides the conditions for learning.

However, mere participation in cultural activities is not sufficient. Novice members of a culture – including the cultures of schools, colleges or disciplines – do not acquire cultural knowledge

on their own. A student's *participation* in disciplinary activities is *guided* by more accomplished others. The concept of guidance is understood here in its broad sense to involve the full range of instruction, scaffolding and support that more expert individuals provide for less expert individuals. Rogoff (1993) invokes the concept of *participatory appropriation* to refer to the processes by which individual learners construct skills and understandings from their actions in social contexts. *Appropriation* can be defined as a process of *taking* and *making one's own*. Participatory appropriation therefore refers to the process of taking control of meanings and skills that have their origins in an individual's active *participation* in cultural activities. The concept of participation is a thoroughly interactive one; the student does not take information from the teacher, the lecture, her peers or a book. Instead, she appropriates elements of meaning and skill from what she *does with* the teacher, the lecture, her peers or a book. The concept of participatory appropriation eliminates the "barrier" between the teacher and the student. There is not the teacher *and then* the student; there is only the dynamic teacher-object-student relation as it evolves over time within cultural contexts. One cannot separate the learner from the social, cultural or disciplinary process of which she is a part.

Figure 2 depicts a socio-cultural-constructivist conception of teaching and learning. This model is consistent with a variety of integrative conceptions of teaching and learning that have been proposed in the literature, including socio-cultural-constructivist approaches (deLisi, 2006; Cobb, 2005), guided participation (Rogoff, 1990, 1993, 1995), distancing theory (Sigel, 1993), and dynamic systems theory (Fischer & Mascolo, 2005; Van Geert, 1993). From this view, teaching and learning are inherently dynamic processes that can be understood in terms of five basic classes of coacting elements. These include: (a) the constructive actions of individual learners; (b) other persons, (c) mediational means and other cultural tools of learning, (d) physical and cultural objects or artifacts on which teachers and learners act, and (e) the broader meanings that exist within the teacher and learner's socio-cultural context. In what follows, I will elaborate upon the basic assumptions of this model and its implications for teaching and learning especially as it occurs within social science classes in college or university settings.

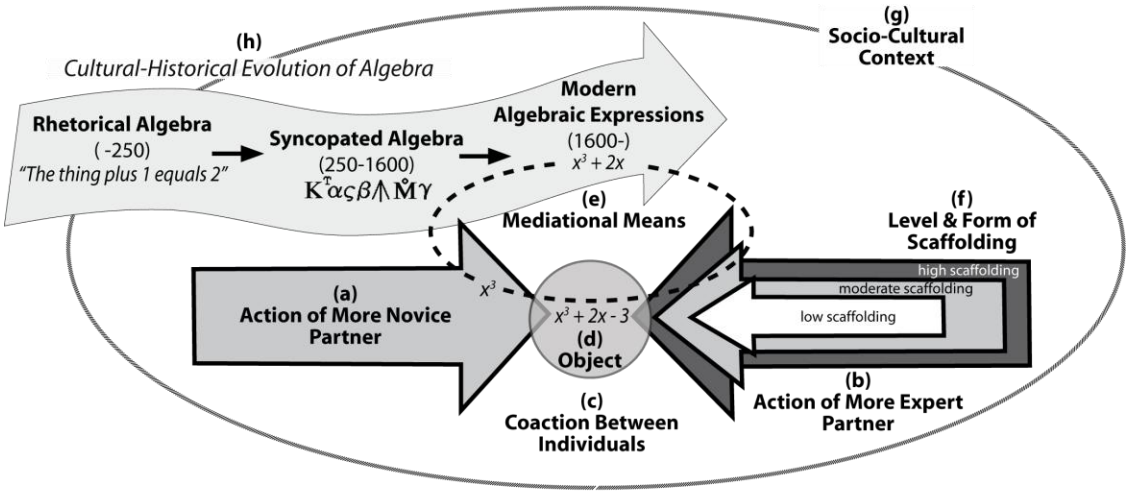

Figure 2: ***Socio-cultural-constructivist model of teaching and learning.*** Learning is neither teacher-centerd nor learner-centered. All learning occur through constructive participation in socio-cultural activity. In a learning episode, (a) a more novice partner (c) acts jointly with (b) a more expert partner within (g) particular sociocultural context. The teacher and learner operate on physical, imaginal or artifactual (d) objects using language, signs and other cultural tools as to (e) mediate joint and individual action. Mediational means provide the vehicle for the appropriation and use of (h) cultural knowledge. Optimal learning occurs as the more expert partner adjusts the level of (f) scaffolding to the conceptual level and needs of the learner.

All Learning is Learning by Doing

All learning occurs by doing; all doing is a form of acting. The basic unit of a socio-cultural-constructivist approach to teaching and learning is *action* (Mascolo, in press). Individual action is indicated in Figure 1 at points (a) and (b). The concept of action implies an active, goal-directed and embodied organism whose operations on the world are mediated by meaning. The concept of action is an integrative one; any given action on the world necessarily involves the coming together of the various psychological processes that we, as psychologists, tend to study as apart from each other – sensing, perceiving, motor action, thinking, feeling, emoting, motivation, etc. To speak of action as the main unit of understanding human functioning renders other psychological processes either as *forms* of action (e.g., thinking is a form of internalized action) or as *aspects* of action (e.g., feeling involves the experience of ongoing activity). The idea that *action* can function as a fundamental unit of psychological analysis has the capacity to transform our thinking about teaching and learning. If all learning is a form of doing or acting, we can then ask: What types of actions are students and professors engaged in? What types of knowledge and skills (doings) do we want to promote in our students? If all learning occurs by doing, what types of actions will best promote the development of such understandings and skills?

It is easy to think of the lecture-and-test approach to teaching as "passive" and activity-based learning as "active". Perhaps a more illuminating way to think of the active-passive distinction is in terms of the degree of *organismic involvement* (Sarbin & Allen, 1968) any given activity requires. Although any given action necessarily involves the coordination of multiple subsystems of action, different activities require different degrees of involvement of an organism's subsystems. The tasks of "running up a hill" and "imagining I am running up a hill" both involve the coordination of multiple subsystems; however, running up a hill involves *greater involvement* of motor, cardiovascular and metabolic systems than imagining running up a hill; whereas imagining running up a hill involves greater participation of visual-imaginative systems than actually running up a hill. Attending to a lecture is also an active process that involves the coordination of multiple subsystems. Learning from a lecture, say, on moral development, is a form of effortful skilled activity. It requires the active coordination of attention to the professor's utterances; the capacity to differentiate what is important from what is less important; skill in organizing the professor's commentary on the page in the form of meaningful note taking; monitoring and identifying when one is understanding or not understanding the lecture; relating new ideas raised in class to existing knowledge; asking meaningful questions, and so forth. Learning about moral development from a lecture is different from learning about moral development by performing a small study interviewing individuals at different ages about their experience with various moral issues. Each activity is distinct and requires different patterns of organismic involvement. A student who performs interviews is more likely to develop a deep understanding of how particular people reason about moral dilemmas; however, she may or may not understand the concept of a moral dilemma as clearly as an individual who has attended carefully to a well-crafted lecture. Thus, it is not helpful to view attending lectures as a passive process and conducting an interview as an active process. Both are forms of doing that call forward different patterns of organismic involvement. As a result, each form of activity holds out the opportunity for a different form of learning.

If all learning is a form of doing, then it becomes essential to ask ourselves about the types of doings in which we ask our students to engage, and the reasons for which we ask them to perform those activities. There are many reasons why college and university professors may choose to engage in lecture-and-test styles of teaching. The most likely reason is simply tradition, coupled with the implicit belief that the purpose of teaching is primarily to disseminate a body of factual and theoretical knowledge. To the extent that a professor's goal is to promote understanding of a particular body of factual and theoretical knowledge, a well

crafted lecture can be an effective means for accomplishing this goal. However, most college or university professors would probably concede that dissemination of factual information is probably *not* the only or even the primary goal of education. A well-designed lecture may serve some course purposes well, but others more poorly. To the extent that this is so, it becomes incumbent upon the professor to (a) identify what types of knowledge and skills she wants to promote in her students, (b) identify the types of tasks and doings that are likely to foster the development of such skills and knowledge, and (c) to teach students how to perform those activities. The resulting course would include a set of guided activities – perhaps including lecture, Socratic dialogue and a suite of active learning activities – that are tailored to the specific learning goals of the course.

For example, consider the various understandings and skills that a professor might wish to promote in courses offered within a psychology department. One might expect that any solid psychology curriculum would operate to prompt the development of (a) theoretical and factual knowledge within a given area of study; (b) understanding of the ways in which philosophical assumptions and values structure theoretical and empirical inquiry; (c) skills for higher-order reading and analysis of psychological texts; (d) the capacity to make inquiries into psychological issues using quantitative, qualitative and other research methods; (e) awareness of how to select research tools and skills that function in the service of one's theoretical goals; (f) the capacity to make professional presentations; (g) skill in collaborating with others in scholarly research; (h) a sense of the ethical duties of psychologists and practitioners, and (i) the student's psychological voice. What are the ways in which a reflective professor might work to actualize these goals? Each of the goals articulated above involves an inseparable melding of both content knowledge and skill. As skills involve some sense of knowing *how*, content knowledge consists of knowing *that*. *Knowing how* informs *knowing that*, and vice-versa. For example, performing a simple research study is a form of activity that necessarily requires the coordination of content knowledge and skill. Although any particular element of the research process requires some form of teacher-directed communication (e.g., lecture, guidance in real time, feedback), the actual performance of the project requires active execution on the part of the student or students. It is through the *guided execution* of the task that students develop and coordinate research skill and content knowledge. From this view, oppositions between knowledge and skill, content and process, teacher-led and student-initiated activity, and so forth, are false dichotomies. In order to learn, students must engage in active doings, whether those doings consist of active reading, writing, listening, speaking, or project execution; however, without active direction and guidance, students cannot develop the skills and knowledge to perform requisite acts of learning.

The Guided Construction of Skills and Knowledge

The socio-cultural-constructivist approach rejects the dichotomization of modes of effective teaching as either student-centered or teacher-centered. Both students and teachers must be active in the learning process, both in and out of the classroom. Student-teacher interaction is indicated in Figure 2 at points (c), (d), (e) and (f). As indicated above, although students must be active in the construction of new knowledge, students do not construct knowledge in a vacuum; they require direction, guidance and instruction that is sensitive to their existing levels of understanding relative to the skills and knowledge under construction. This point implies several important corollaries.

First, all new knowledge and skills are elaborated from existing knowledge and skills. From this view, it is not possible to teach something entirely anew. Any concept that is communicated to a student will necessarily be assimilated to existing ways of knowing. The only way for a student to apprehend a new concept is through the application and extension of existing concepts. If this is so, any attempt to prompt the construction of novel understandings or skills

should begin by identifying the student's current level and form of understanding of the concepts in question. Learning occurs as a process of bridging the gap between the student's current level of understanding and the next most proximal level of skill or understanding. At this point, the difference between a Piagetian constructivist conception and a Vygotskian-inspired socio-cultural approach becomes crucial. From a classical Piagetian view, the role of the teacher is to provide (a) experiences that *conflict* with the child's existing level of understanding, and (b) opportunities to perform activities that will allow the student to find ways to resolve such conflicts, which thus allow students (c) to restructure existing knowledge in normative directions. Although both the Piagetian and Vygotksian approach advocate instruction that lies beyond the student's current level of development, the Vygotskian approach differs substantially. The socio-cultural model draws upon the idea that students operate at higher levels of development when they work with more expert individuals than when they operate alone (or with peers). As a result, the function of social interaction is to raise the student's level of performance beyond that which she can sustain alone. Learning occurs as students reconstruct and appropriate for themselves elements of meaning and skill that have their origins in guiding activities that occur between the student and the more accomplished other. Within the Piagetian approach, the student can rely only on his actions and reflections (or the disequilibria provided by peers) to move his thinking to a higher level; from a Vygotskian view, interactions with a more accomplished other not only pull the student's thinking higher than he can sustain alone, but also in the direction defined by disciplinary knowledge and conventions. In this way, as indicated in Figure 2 at point (f), learning involves an active teacher who adjusts his level of scaffolding to the learner's developmental level.

The discursive use of language (and other sign system) between teachers and students is a key aspect of the developmental process. As indicated above, language functions as the living repository of cultural and disciplinary knowledge. Mastery of disciplinary knowledge requires that one masters the use of the language and signs of that discipline. This is indicated in Figure 2 at points (e) and (h). Point (h) describes an aspect of the cultural history of disciplinary activity in the mathematical domain of algebra. It is tempting to think of mathematical knowledge as a universal reflection of human logic or rationality. However, this is not the case. Mathematics, like all disciplinary knowledge, evolved over long periods of time. It is only within the last 400 years that algebra employed the kinds of symbols and equations that we utilize today. Algebraic knowledge evolved through three basic phases: *Rhetorical algebra* (prior to 250 AD), *syncopated algebra* (250-1600) and *symbolic algebra* (1600-present). Rhetorical algebra was organized without the use of symbols, using ordinary language and numbers. For example, the modern equation "$x + 1 = 2$" would be represented as "the thing plus 1 equals 2". Syncopated algebra involved the early use of symbols, but in ways that differ from contemporary use. Symbolic algebra emerged with the work of Leibniz to include a formal and consistent system of symbols and relations (e.g., $3x^2 + 2x - 1$). Thus, contemporary algebra is organized in terms of a series of symbolic conventions and relations.

The task of mastering algebra requires facility with the rules governing the use of these sign systems. The signs and symbols that constitute algebra function as *mediational means* – they operate as the vehicles that mediate the operations that one performs when one performs algebra. Mediational means are indicated in Figure 2 at point (e). With respect to any given student, these mediational means exist within cultural activity that *predates* the student. The task, therefore, is one of assisting the student in gaining entry into the requisite system of mediational means. When students gain mastery of the use of the mediational means that define the practice of algebra, they are able to *think algebraically*. Doing algebra and thinking algebraically are thus mediated by mastery of the use of a system of signs and symbols that have their origins in cultural history. Learning how to do pre-modern algebra involves a different set of operations than learning contemporary algebra. The proposition that acquiring disciplinary

competence involves mastering the use of mediational means underscores the central role of the teacher in structuring educational discourse. While there are many ways to organize learning activities in ways that allow students to gain facility with the rules that govern the use of signs and symbols within a given discipline, none of them can occur without the expert guidance of a more accomplished teacher.

III.

Active Learning Techniques Function in the Service of Pedagogical Goals

Constructivist, student-centered, and socio-cultural approaches to pedagogy have spawned a wide variety of different active learning modes, strategies and techniques. For some, such modes of learning operate as general approaches or philosophies of teaching (Burbules, 1993; Kilgore, 2004; Knowlton & Sharp, 2003; Werdinger, 2005; Weimer, 2002); for others, they function as particular types of learning strategies or techniques (Barkley, Cross & Major, 2005; O'Brien, Millis & Cohen, 2008). A large and growing body of literature has examined the effectiveness of various sorts of active learning techniques in a wide variety of disciplines with students from kindergarten through graduate school.

There is a variety of different techniques that fall under the broad heading of active learning. These include but are not limited to *cooperative learning* (Guilies & Ashman, 2003; Sharan, 1990) *collaborative learning* (O'Donnell, Hmelo-Silver & Erkens, 2005); *problem-based* or *inquiry learning* (Capon & Kuhn, 2004; Knowlton & Sharp, 2003), *experiential learning* (Hopkins, 1994; Wurdinger, 2005), *participant learning* (Tsien & Tsui, 2007) and related approaches (Burbules, 1993; Rogoff, Turkanis & Barlett, 2001). Many of these learning methods have been developed and elaborated in the context of elementary and secondary school (K-12) education (Slavin, 1990; Sharan, 1990). In recent decades, versions of these methods have been adopted in colleges and universities (Johnson, Johnson & Smith, 2007). Although is some lack of consensus about the meanings of these terms, and although these modes of learning overlap, it is possible to offer some basic definitions. *Problem-based* or *inquiry learning* consists of learning activities in which groups of students collaborate in an attempt to solve particular problems. Problem solving requires a variety of different sub-skills that can be coordinated through goal-directed collaboration among students. Problem-based learning is often used in classes that lend themselves to laboratory or small group work, but has also been adapted for large classrooms (Oliver, 2007). *Experiential learning* refers to a mode of learning in which students construct knowledge and skills through direct action, experience and reflection (Estes, 2004). From this view, the role of an educator is to provide the experiences from which learning can occur through active reflection. Experiential learning has its origins in Dewey's (1938) inquiry-based approach to learning. Although experiential learning is often practiced in applied community settings, such as internships, community service, and field work, it can also be used in classroom settings (Wurdinger, 2005). *Participative learning* involves providing students with the opportunity to play an active role in the structure and content of courses and learning activities. In collaboration with a teacher, students may be involved in the design of course syllabi, identifying course assignments, creating student assessment devises, and even grading (Simkin, 2005; Wingfield & Black, 2005).

Collaborative, *cooperative learning* and *problem-based learning* are among the most thoroughly studied of active learning methods. *Collaborative learning* refers to goal-directed learning that occurs in small groups of students (O'Donnell, Hmelo-Silver & Erkens, 2005). These forms of learning are sometimes called *peer-assisted learning*, *group learning*, *peer-tutoring*, and other terms. *Cooperative* learning is special form of collaborative learning that is generally defined in opposition to *competitive* or *individualistic* learning (Johnson & Johnson, 1990). Competitive learning occurs when individuals or groups must work in opposition to each other; individual learning simply consists of learning by one's self, often in a competitive

context. In contrast, cooperative learning is deliberately organized through an interdependent structure in which group members must rely upon one another to perform particular learning tasks. An important tenet of cooperative learning is the notion of *intentional design* (Barkley, Cross & Major, 2005). It is, perhaps, a common practice among instructors simply to organize students into groups and provide an assignment for group activity. However, such practices are not necessarily conducive to successful collaboration. The goal of cooperative learning is to organize student activity around a pedagogically meaningful task in which students must cooperate for task success. For example, Johnson and Johnson (1990) identify five conditions for promoting cooperative learning within groups. *Positive interdependence* refers to the idea that no single individual in a group can succeed unless all individuals in the group succeed. *Goal and resource interdependence* refer to the ideas that all members of the group must cooperate in order to attain a common goal, and must mutually rely upon the resources provided by different members of the group. Groups must engage in *face-to-face interaction* in which each individual is *individually responsible* for performing a fair share of the work and for working to facilitate the process of goal attainment by others in the group. One example of this process is the classic jigsaw model (Aronson et al., 1978; Slavin, 1980; Kagan, 1986). In this approach, each member of a learning group is provided with resources related to only one aspect of an assignment or joint project. Students are accountable to their partners to teach them the parts of the lesson for which they are responsible. Within the larger classroom, different jigsaw groups are accountable to each other for communicating different aspects of an organized lesson. This is but one of scores of different types of collaborative learning approaches.

Research on the effectiveness of collaborative and cooperative learning methods as opposed to traditional classroom instruction is voluminous. While much of this work has been conducted in elementary and secondary schools (K-12), a large and growing body of studies has examined cooperative learning in colleges and universities. Overall, the comparative effectiveness of collaborative learning methods over traditional instruction can be described as positive, but somewhat mixed. Springer, Stanne and Donovan (1999) conducted a meta-analysis of studies assessing student achievement and persistence as a function of small group learning in science, mathematics, engineering and technology classrooms. Barkley, Cross and Major (2005) summarize the results of Springer, Stanne and Donvan's meta-analysis as follows: (a) students in collaborative learning classrooms exhibited higher levels of achievement and persistence than students in traditional classrooms; (b) improved performance was stronger when students were assessed with instructor-generated examinations than with standardized tests; (c) students described collaborative learning more positively than traditional learning experiences; (d) meetings among students that occurred outside of class produced greater achievement than in-class collaborations; however, within-class collaborations resulted in more positive evaluations of learning activity than did out-of-class collaborations. These results corroborate in college and university settings the positive effects reported collaborative learning found in primary and secondary education.

These positive findings notwithstanding, there are a variety of questions that can be raised about research that compares collaborative learning and traditional learning. In higher education, while studies comparing collaborative learning to traditional learning often indicate the superiority of collaborative learning, this is not always the case (Wingfied & Black, 2005). More importantly, in many studies it is not always clear exactly what students are asked to do in collaborative or traditional classrooms. Further, in some studies collaborative and traditional instruction is explicitly manipulated. In so doing, lecture-based classrooms are designed in ways that explicitly discourage types of student engagement that *can* go on in a traditional classroom. For example, in one study, "Demonstrations, models, overhead transparencies, and projection slides were sometimes used during the lecture…One two or three occasions during the semester, the class was shown a lengthy video or movie that reinforced the presentation

delivered during the previous session….Very little time was provided for student questions during the class" (Lord, 1999, p. 24). It is unclear the extent to which the forms of teaching implemented in these studies are representative of the *best* forms of traditional education. As a result, it is not always clear what forms of teaching and learning account for the performance differences that are observed. For example, as summarized by Barkley, Cross and Major (2005), in college samples, outside-of-class collaboration played a larger role in boosting academic performance than within-class collaboration. There are many reasons for why this may be the case. It is possible that students were able to devote more time to outside-of-class collaboration; that more motivated students spent time in extra-class study sessions; that extra-class collaboration was more focused on aspects of coursework that would be evaluated, etc. It is possible that much learning occurs as a result of individual and collaborative activity that occurs outside of class in both collaborative and traditional settings (Dickinson & O'Connell, 2001). These results suggest that in evaluating modes of learning, it is important to take into consideration the structure and content of the entire experience of learning in any given course of study.

In addition to the positive outcomes of peer collaboration, there are a number of difficulties that require attention. First, as indicated above, successful collaborative learning requires the intentional design of activities that direct student attention and learning in particular pedagogically meaningful directions (Barkley, Cross & Major, 2005). Such intentional structures are often difficult to create and maintain, and thus require a degree of flexibility and innovation on the part of the professor. Second, collaborative learning generally requires more time than traditional learning. This raises questions of what should topics be prioritized in any given course and the appropriate relationship between breadth and depth of analysis in any given course. Third, within collaborative learning, a variety of different group dynamics arise that, left unchecked, can limit the positive effects of collaboration. These include the dominance of some peers over others (O'Donnell & O'Kelly, 1994); the failure of some group members to contribute to collaborative activity (Joyce, 1999); the emergence of non-cooperative discourse among group members (Liang, 2004; Thompson & Ku, 2006); lack of instruction, monitoring and support about how to engage in group interaction (Veenman, Kenter and Post, 2000). Further, instructors must also address the issue of how to hold individual members of a group responsible for the purpose of grading (Shindler, 2004), and how to address inevitable clashes that occur during group work. These problems do not negate the promise of collaborative learning; instead, they indicate areas where care in needed in its implementation. A variety of ways to address this issue has been documented (Quarstein & Peterson, 2001; Roberts & McInnerney, 2007).

Active Learning in Traditional Classrooms

An important but often neglected form of active learning is one that might be called *traditional active learning*. Traditional learning is often understood to refer to the teacher-led lecture method of instruction. However, this is an overly narrow conceptualization of traditional education. There are several reasons why this is the case. First, assessments of teaching style on student performance only address what occurs within the classroom. However, there is more to a course of study than what occurs within the classroom. Much learning – perhaps even most learning – occurs as a result of activities that occur *outside* of the class. Among these include the basic activities of reading, writing, studying for examinations, and so forth. Successful performance in reading requires that students organize written material; extract main points and supporting ideas, relate ideas at hand to issues discussed in current and past classes, and so forth. Writing is an especially integrative learning activity. Writing a successful paper requires the active integration of multiple skills, including understanding content knowledge, elaborating a thesis, identifying connections among ideas, elaborating main points and supporting details, reflecting upon the structure of argumentation, and so forth. The pedagogical value of these

learning activities often escapes the notice of college and university professors, perhaps because these activities are assumed as part of the background of a college course. Second, there are a variety of activities that occur within many traditional classrooms activities require active engagement on the part of the student. These include, but are not limited to the guided interpretation of texts (Lapp, Fischer & Grant, 2008), Socratic dialogue (Overholser, 1992), and even effective note-taking (Brazeau, 2006). Guided interpretation of texts occurs when teachers and students read a text – usually an original source – together. The professor guides students in their attempt to understand and interpret the text. Guided interpretation is a rich process that allows students to exchanges their interpretations with the teacher and with other students. The teacher – by virtue of having more expert knowledge than the student – can direct the student toward or away from particular readings of the text. In this way, students can not only acquire informed ways of understanding a text, but also develop skills for organizing and comprehending complex scholarly material. This form of interaction may be distasteful to some postmodern scholars who might argue that the professor's interpretation of a text, as but one of many possible perspectives, should not necessarily be privileged. Nonetheless, within teacher-student dialogue, there is ample room for many ways to approach the interpretation of the text, including those that cast doubt on the professor's particular sense of a reading.

Because they involve active engagement and constructive effort on the part of the student, these traditional activities can properly be regarded as instances of active learning. While proficiency with these basic skills is often assumed by college professors, this is not necessarily the case. Many college students enter college without the reading, writing, and organization skills needed to support higher-order independent learning (Linderholm, 2006)[4]. Further, as professors, it is easy to forget that even under the best of circumstances, the skills required for college level work are not completely developed by the time that students enroll in college. Higher-order scholarly activities require higher-order skills. Such skills, like any skills, are acquired through the process of guided participation. Without recognizing this point, it is easy to simply assign readings, paper assignments, presentations, or other projects without realizing that students require instruction in how to perform these tasks. Such instruction should not be regarded as ancillary to the functioning of a college course. Practices such as writing papers and preparing presentations are not simply means for student assessment; they are learning activities. The process of guiding students through such learning activities is thus an instance of teaching students how to learn. Such practices provide the core skills that undergird the development of active, self-directed learning.

The Central Role of Feedback in Fostering Learning and Development

The provision of feedback is central to effective learning and development. College courses vary dramatically in the extent and form in which feedback is provided to students. In some classes – particularly those that rely upon traditional lecture-and-test format – feedback is often limited to the grade that a student obtains on a test. In such circumstances, students are neither provided with specific information about how to improve their skills and understandings, nor are they provided with opportunities to put feedback into practice by reflecting upon and revising their work. From a socio-cultural-constructivist point of view, effective feedback operates as a form of scaffolding that promotes ongoing and future learning and development.

[4] It is possible that many professors rely upon lecture-and-test as a primary mode of instruction *because* students lack basic skills. Professors may use the lecture to disseminate information because they feel students are incapable of acquiring an understanding of what they read. While understandable, such practices, if they exist, would function to perpetuate the problem of substandard skills among students in higher education.

From this view, effective feedback addresses at least four interrelated properties. First, it provides direction for the growth of skills and knowledge. In a review of 12 meta-analyses of research assessing feedback provided by teachers to students, Hattie and Timperley (2007) identified three effective forms of feedback: *Task feedback* involves commentary about the student's performance on a particular task (i.e., identifying errors; redirecting student interpretations, etc.); *processing feedback* consists of suggestions about strategies for monitoring, evaluating and revising their own work; feedback about *self-regulation* provides communication about ways to direct their own learning through effort, self-monitoring, and integrating evaluative feedback from others with internalized learning goals. These forms of feedback promote increasingly higher-order skills that contribute to the development of self-regulated learning.

The mere providing of feedback, however, is insufficient. In order for feedback to be effective, there is a need to provide students with the opportunity to implement feedback to improve understanding and skills (Heylings & Tariq, 2001). For feedback to be effective, reflection upon teacher commentary, the opportunity to revise work and to re-learn skills and understanding must be built into the structure of the learning experience. In the absence of opportunity to use an instructor's feedback, instructors often find that their laborious efforts to provide commentary on student work is simply ignored by students who may not even seek the return of papers that have been submitted. In integrating feedback into the learning process, the level of commentary provided by the teacher becomes important. Effective feedback avoids the extremes of being either too global or too specific. For example, when providing feedback about student writing, comments that provide global evaluations (e.g., "good job") or which simply identify a failed standard (e.g., "awkward") fail to indicate what a student has to do to correct the problem. Contrastively, feedback that identifies and corrects particular passages fails to provide the student with an opportunity to revise problematic passages on his or her own. As such, feedback that requires a student to actively apply a concrete rule in revising a writing assignment provides the student with a problem to be solved and the means to solve that problem.

Feedback is more than the mere provision of information. Providing feedback is type of communicative act that occurs between two people within the context of a socio-cultural activity. Like any communication, it occurs against the backdrop of the rules and expectations of the parties involved. To the extent that learning occurs by doing, it follows that students learn through their participation in the communicative exchange itself. How a professor engages the student when providing feedback is as important as the content of the communication itself. In this way, effective feedback necessarily takes into consideration the interpersonal and self-evaluative aspects of teacher-student communication (Dennen, Darabi & Smith, 2007). Teacher-student exchange provides the opportunity to assist a student in defining ways to position himself in relation to the learning process. As but one example, how an instructor frames his commentary has implications for the development of a student's sense of self as a learner. Dweck and her colleagues (Dweck & Leggett, 1999) have demonstrated that a student's conception of self-as-learner has profound implications for how he or she approaches learning. Students who adopt the belief that their "ability" or "intelligence" is fixed often tend to avoid the challenge of difficult learning experiences. However, students who adopt an incremental view of learning – the idea that learning is a step-by-step process of self-improvement through effort and hard work – are more likely to rise to rise to the challenge and put forth the level of sustained effort necessary to master difficult learning experiences. Instructor feedback can play an important role in promoting the development of "growth" rather than "fixed" mindsets in students (Dweck, 2006; Schapiro & Livingston, 2000). Feedback that (a) acknowledges a student's ongoing progress, (b) articulates the value of hard work and continuous improvement, and (c) identifies what a student has to do in order to take the next

incremental step in developing any given skill or understanding can foster the development of a student's sense of the value of incremental learning over the mere attempt to meet particular performance goals.

IV.

Coordinating Pedagogical Goals with Different Modes of Doing

All learning is learning by doing. Learning occurs through the ways in which one participates in socio-cultural activities, whether these activities occur within or outside of educational contexts. If all learning occurs by doing, then it becomes important (a) to reflect broadly upon the learning outcomes that we wish to promote in our students, and (b) identify particular types of pedagogical activities that will best bring about those learning outcomes. The task of reflecting upon desired learning outcomes will readily bring most teaching professors beyond the goals and values that inform traditional lecture-and-test approaches to education. An informed approach to teaching, however, would not discard any particular pedagogical strategy *a priori*. Instead, a reflective professor would work to adopt pedagogical strategies that are best coordinated with his or her teaching goals.

Figure 3 provides a visual representation of a variety of traditional and progressive teaching methods. The diagram is organized along two dimensions including the extent to which (a) the teacher is *directive versus non-directive,* and (b) learning occurs *individually versus collaboratively* in social groups. These two dimensions result in four quadrants of teaching and learning activity. *Directed learning in groups* is indicated in the upper-right hand quadrant. The quintessential teacher-directed group learning activity might include the practice of choral recitation, indicated in the upper right hand corner of the diagram. Choral recitation occurs when students imitate in unison what a teacher says and does. Choral recitation occurs in kindergarten and elementary school mathematics classrooms in China, where students learn mathematics facts in collective drills (Stigler, Lee & Stevenson, 1987). The traditional lecture-and-test approach is displayed at the extreme right hand portion of the diagram. This form of teaching is indicated at the extreme end of the teacher-directed dimension. However, because traditional lecture occurs in groups that do not collaborate in their learning, it is identified at the midpoint of the social/individual dimension. The upper left hand quadrant depicts various forms of *open-ended learning in groups*. Various forms of active and collaborative learning methods depicted in the upper portion in both the open-ended learning and directed learning quadrants. As one moves toward the left hand pole of the upper right quadrant, the expert role of the teacher gradually diminishes, and the teacher-student relationship is increasingly viewed as a partnership among equals. The lower two quadrants reflect more individualized forms of learning. *Self-directed learning* is depicted in the lower left quadrant, which *didactic and dyadic direction* is represented at the lower right. Independent learning is represented in the lower left hand corner, and reflects a maximum degree of individual learning outside of the influence of teachers. Expert-novice tutoring is represented in the lower right hand corner as a form of teacher-directed activity that is individually tailored to the needs of the student. The mentor-mentee relationship is depicted at the midpoint of the teacher versus self-directed continuum. In such a relationship, a mentee is afforded wide latitude in conducting individual learning activities, but under the supervision, guidance and advice of the more expert mentor.

As indicated above, active collaborative learning methods are represented in the two upper quadrants of Figure 3. The representation of active and collaborative learning across these two quadrants can be understood in two ways. First, different teaching professors will approach their classrooms from different theoretical, ideological and epistemological perspectives. Collaborative learning as represented in the *directed learning* quadrant (i.e., upper right) proceeds from the theoretical position that collaborative learning among peers optimally occurs when its goals and procedures are scaffolded, directed and supported by an active teacher.

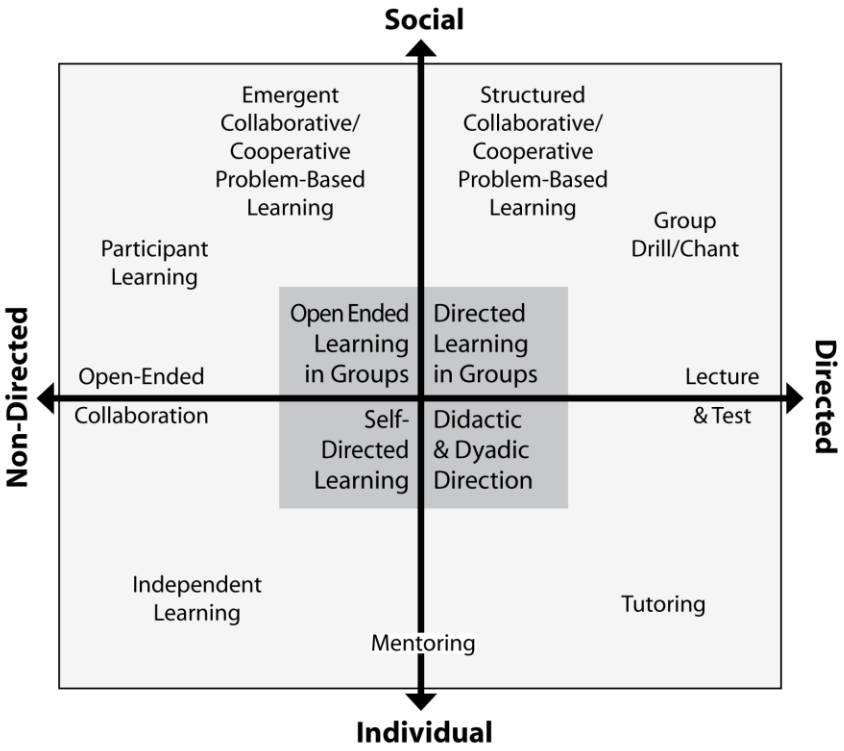

Figure 3: ***Modes of Teaching and Learning in Conceptual Space.*** Two dimensional representation of modes of teaching and learning. The horizontal axis reflects *degree of teacher direction* in the learning process; the vertical axis depicts *individualized versus group learning*.

Collaborative learning methods in the upper left hand quadrant often proceed from more social constructivist (Brufee, 1993; Rhinehart, 1999), postmodern (Kilgore, 2004) and liberationist (Friere, 1974; Long, 1995) orientations. Founded upon the idea that the construction of knowledge proceeds as a social and collaborative process, such pedagogical approaches seek to decentralize the power and authority of the teacher in an attempt to empower the experience and constructive activities of the individual learner within the social process of learning. A second way of understanding differences in the power and authority of the teacher or instructor lies not so much in theoretical orientation, but in the level of relative *expertise* held by persons assuming the teacher and student roles. From this orientation, the increasing decentralization of the role of the teacher that occurs as one moves from the right to the left hand quadrants can occur with as learning partners assume increasingly equal status, expertise or power. Such a shift might correspond, for example, to a shift from the practice of teacher-guided collaborative learning between professors and undergraduate education students (middle right) to teacher-training workshops run by teachers with special expertise (middle left) to collaborations among teams of teachers brainstorming to develop new ways teaching strategies in their classrooms (extreme left).

There are many ways to approach the task of teaching and learning. Advocates of student-centered approaches have raised important challenges to traditional teacher-centered approaches to pedagogy. The burgeoning literature on active and collaborative learning has introduced a variety of potent practices that, under the appropriate circumstances, function as powerful vehicles of learning. However, the tendency to discriminate teaching methods along the student-centered/teacher-centered dimension is built upon a failure to appreciate the inseparable nature of individual activity from the socio-cultural processes of which it is a part. All learning is a form of doing that necessarily occurs within the context of particular socio-

cultural activities. This statement is equally applicable to different forms of active and collaborative learning, lecture-and-testing, self-directing learning, individual tutoring, or blended combinations of these activities. The proposition that all learning occurs by doing does not by itself justify the use of any particular mode of learning. Instead, it suggests that there is a need to reflect upon and articulate one's teaching and learning goals and coordinate them with the forms of doings that are most likely to actualize target outcomes.

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