Learners' Permit: A Pedagogical Model for Advancing Epistemic Agency in Students

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Abstract

Despite decades of increased focus on educational models to improve student achievement, there remains a disconnect between educational inputs and measurable outcomes. This paper provides a critical review of existing theories, models, and approaches, and integrates these into an original model that connects inputs to outcomes. The unique contribution of this model is its potential to increase student achievement by fostering epistemic agency, or having authority over one's own knowledge advancement. This model is optimal for middle school classrooms because students are more developmentally prepared for self-directed learning activities than lower elementary students, and the classroom structure and schedule is more suited for interdisciplinary activities than in high school. Nonetheless, the model can be adapted to other grades allowing for a cost-effective, scalable model which incorporates 21st century learning goals and standards, and remains flexible enough to adapt to evolving theories, standards, and policies in the coming years.

Introduction

Educational theories, policy makers, and entrepreneurs have long sought a remedy to the lagging progress of American schools by global standards. Measures of systemic failures abound; from international standardized tests, to retention and graduation rates, to anecdotal narratives of students being "left behind" (Rich, 2012).Yet, it remains a long-standing practice to idealize the perfect single solution to an underperforming system, despite the clear challenges of identifying one such silver bullet.

The public education space is steeped in theories, approaches, and measures. Instructional models[1] and performance expectations are introduced and retracted with such regularity and speed that often there is not adequate time to fully implement and evaluate the models or approaches in relation to the intended indicators of success. As new models are developed to reflect emerging learning theory, or to address perceived deficiencies in student performance, they often fail to meet the expectations of the stakeholders. Most notably, in the 30 years following publication of *A Nation at Risk* (1983), educational spending has doubled, but student achievement has increased only marginally (Kern, Innovating Toward New Learning Models, 2011).

Perhaps there is not a static "one size fits all" solution to be found. Rather, a solution should make use of the approaches and strategies that are relevant to the local environment. *Learner Epistemic Agency Pedagogical (LEAP) Model,* a dynamic, student-centered, interdisciplinary, differentiated, experiential[2] model, is designed to recognize the value of existing models, approaches, and theories by allowing for the unification and synergy of best practices in upper elementary and middle school classrooms while promoting the agency of each student.

This model is largely positioned within the 21st Century Skills framework. The Partnership for 21st Century Skills, an organization comprised of commercial and corporate business members, has developed this framework for development of skills needed in the new global economy. While the skill sets identified are not unique to the Partnership's framework, they illustrate the broad range of both enduring and emerging goals for American education. The LEAP model is responsive to these goals; however, it is also flexible enough to accommodate alternate or additional frameworks depending upon a variety of needs. Using the 21st Century skills framework as an impetus, the following questions are addressed in this paper:

[1] In this paper, the term "model" is used to describe a comprehensive instructional solution. Models include pedagogical, curricular, and environmental design considerations (e.g., International Baccalaureate schools). Conversely, "approach" is used to describe a simple, stand-alone, localized solution (e.g., cooperative learning) to a specific instructional issue (e.g., KWL encourages prediction skills).

[2] The terms "authentic" and "experiential" are used throughout to describe a "real world" or outside-of-school setting. Generally, it is used in this paper to describe learning in a meaningful, lifelong, way.

- What elements are necessary to meet the goals for education in the 21st century?

- What existing models or approaches have shown success or promise in incorporating those elements, and how are they executed?

- How can the best aspects of those models and approaches be synthesized in a workable classroom model?

In the first section, I examine of the context and constraints of public upper elementary and middle school education, and introduce a high-level, practical illustration of LEAP. In the second section, I delineate key elements of a successful educational model and support their inclusion in the LEAP model through a survey of historical and contemporary learning theories—as well as instructional models and approaches which integrate learning theories—while detailing the strengths and limitations of each.[3] Finally, I present a practical blueprint of the LEAP model in the third section, including a description of how the elements and approaches are reflected in the model, how the model functions on a practical level, and an example of a learner-generated instructional plan is offered.

Section I: The Context of American Public Schooling

K-12 public education in the United States is a dynamic space where curricula, pedagogy, and educational technologies must evolve with economic, social, and cultural needs (Computing Research Association, 2005). Each administration brings new policy; outcome-based policies such as *No Child Left Behind (NCLB)* and *Race to the Top* are de rigueur in the 21st Century. While the growing influence of federal policies has altered the landscape of public education in the United States, policy alone cannot remedy the shortcomings of American public schools. Many of these policies establish strict performance expectations which can be restrictive and limiting, resulting in a metaphorical "glass ceiling" for instruction. Such policies pay great attention to the minimum requirements for student performance—such as Grade Level Equivalent benchmarks (GLEs)—leading to an environment where adequacy, not excellence, reigns. Even the nomenclature of NCLB emphasizes a low threshold for success with *Adequate* Yearly Progress (AYP) expectations. Because emphasis is placed on the lower-end of the performance spectrum, AYP can mask the true level of accomplishment (or lack thereof) at the school level, lulling the public into a false sense of achievement. Public school educators are subject to the pressures of outcome-based policies in ways which, could be argued, are unprecedented. Considerable resource is devoted not only to the tailoring of the content to match the content and form of high-stakes assessments, but significant

[3] It is not within the scope of this review to analyze the related models and approaches in their entirety. Rather, it identifies and evaluates aspects of each which are related to the primary elements of the LEAP model.

instructional time is also reserved for the administration of the tests. According to the International Reading Association (IRA), teachers often respond to accountability pressures by focusing their attention and instruction primarily on lower-performing students and adapting the instruction to cover only lower-level skills (International Reading Association, 1999).

Consequently, educators might be reluctant to stray too far from the status quo and provide a more personal and responsive approach to instruction. The financial—and therefore operational—consequences of schools failing to meet AYP requirements jeopardize both the schools' future and the educators' careers. What seemingly has been lost with the growing movement toward the federalization of education is the instructional emphasis on act of learning instead of on the imperfect, and perpetually shifting, act of measurement. Reform efforts should make student needs paramount, and the instructional methodology employed to meet those needs should drive policy, not be limited by it.

In lieu of a limiting NCLB top-down approach, reform that originates in the classroom can provide a catalyst for deep political transformation, not superficial and palliative measures that placate the public with placebos. Unfortunately, the initiation of such reform, and the adoption of programs responsive to those needs, is not necessarily a simple task. Policies and approaches may be at odds with each other limiting educators' abilities to meet designated goals. In fact, public education as a whole lacks a consensus on the overarching goals, and ideological differences in a decentralized system can result in friction and challenge sweeping reform (Partnership for 21st Century Skills, 2007). For example, with NCLB, AYP is measured through tools aligned to state-defined criteria. However, the assessments in one state may not measure the same standards or skills as in a neighboring state, and the assessment tools may vary in rigor, potentially depreciating the value of the AYP data. This attempt to standardize a largely decentralized system illustrates that friction and can jeopardize instructional reform efforts.

Consequently, practitioners are burdened by a variety of external influences on classroom instructional practices and are charged with meeting conflicting goals and demonstrating efficacy through incongruent measures of student performance. Even within a single reform effort, educators are tasked with an array of goals and expectations to meet. For example, the 21st Century Skills framework calls for: both authentic applications *and* academically rigorous content; the addressing of not only cognitive but *also* affective domains; the execution customized assessment *and* the implementation of system-wide assessment approaches; and the meeting of each and every child's needs *while concurrently* addressing societal goals (Partnership for 21st Century Skills, 2007, p. 6).

Unfortunately, educators often are provided with only cursory direction or ineffective training in preparation for accomplishing these lofty goals within the classroom, yet remain accountable for demonstrating student progress toward achieving

them. Recent federally funded studies demonstrate that there are minimal, if any, increases in student achievement related to educator professional development (PD), including PD programs which are aligned to strict, recognized standards of practice (Education Week, 2011).

Meanwhile, theorists, policy makers, and commercial entities continue to generate new approaches, mandates, and programs. Each of the stakeholders is in search of a simple solution, but each also struggles to provide solutions that are flexible and responsive to current—and future—theoretical, pedagogical, and political demands. Some of these solutions are input-based, focusing on the ways in which resource, instruction, and pedagogy can influence the learning process. Other solutions are outcome-based, centering on measures of achievement such as assessments, performance indicators, and GLEs. These solutions, like the previously discussed policies and goals, also can be at odds with each other. Unfortunately, the learning environments in which the models and approaches are implemented may not demonstrate the flexibility or the ability to evolve with emerging theory or policy needed to resolve the tension between input-based approaches and outcome-based measurement.

Compounding this is the reality that learning theory is generally borne out of academia, an environment which one could argue emphasizes the value of analytical differentiation between theories and approaches more than the synthesis of understanding. Further, educational theory not developed with design research methodology—where theory development evolves with the research protocol—may not result in a tenable, replicable model founded in the application and refinement of the theory in non-laboratory environments (Collins, Joseph, & Bielaczyc, 2004). Successful models must "provide an excellent and equitable education for every child [and] schools must more effectively incorporate advances in learning science into instructional practice" (Partnership for 21st Century Skills, 2007, p. 5). The successful marrying of research, theory, practice, measurement, goals, and policy will be instrumental in finding the ever-elusive perfect solution.

Section II: Elements of a Successful Learning Model: Building LEAP

Learning theories evolve over time and compete for valuable instructional hours. Regardless of the similarities or complementary nature of the theories, schools see a cyclical adoption and abandonment of theories, even those theories which share common core attributes. The LEAP model is not rooted in any one learning theory—it has a foundation in a variety of learning theories and the flexibility to incorporate others, both now and in the future, depending upon the goals of the local community and the student population, as well as in response to practitioner-generated data or experiences. The goal of balancing the most effective and synergetic aspects of sound learning theories, models, and approaches is reflected in Bransford, Brown, and Cocking's (2000) research into the four perspectives of learning environments: 1) learner-centered, 2) knowledge-centered,

3) assessment-centered, and 4) community-centered. The authors detail how the four perspectives overlap, mutually influence each other, and must be aligned to the goals of the local learners, school, and community, while emphasizing that there is not a specific target balance that should be achieved. Rather, the four perspectives should be integrated to varying degrees depending upon local goals (Bransford, 2000). The balancing of diverse approaches and allowing local flexibility is instrumental in the LEAP model as well.

This examination of the context of American schooling suggests that a successful model must resolve the tension between other models and identify ways in which those disparate elements can complement each other in practice. Such a model must 1) allow for the easy implementation of a range of theories and models to work in synergy; 2) meet the demands of policy and assessment; and, 3) allow for customization based on local population needs.

Foundations of the LEAP Model

The LEAP model begins with this simple premise: students have agency in their learning experiences and should be active participants in determining the course and process of those experiences. The LEAP model is designed so that meaningful student input occurs from inception of an instructional objective to the definition of an authentic problem to the final evaluation of the products of learning. This approach is supported by creativity researcher Keith Sawyer (2012). Research has shown that creativity can be fostered by allowing a learner not only to solve problems in an authentic context, but also by participating in the act of defining those problems. Doing so encourages divergent thinking, a source of creative activity. This can be accomplished through the collaboration of teachers and students in solving the ill-defined problems and in debating the issues related to those problems (Sawyer, 2012).

One can see this approach thriving in an open-ended, yet structured, environment. Critics of an approach allowing this level of student input and control might caution that such a model could promote wild abandon, envisioning an environment where educators leave learners in charge without direction. To the contrary, the LEAP model is designed so that there exists an overall structure to the program, with clear expectations and learner tools to ensure success, resulting in a more appropriate and effective way of engaging students and employing their inherent abilities to provide meaning and purpose to their own learning processes.

Because the LEAP model is heavily inclusive of self-directed learning design in conjunction with the need for a collaborative, cross-curricular, integrated environment, the architecture, the model is optimized for an upper-elementary self-contained or a middle school interdisciplinary team-approach classroom. While it requires that the educator reconstruct his or her conceptions of the role of the educator in the classroom, concerted planning, and the ability to adapt to a wide range of variables, the structure of

the model is actually quite simple. In many ways, the relationship between the educator and the learner in the LEAP model is not novel, at least not when compared to learning outside of the classroom.

Consider the distinction between the traditional classroom and authentic learning, for example. Toddlers do not learn to speak through standards-based, outcome-oriented, regimented, Cartesian models of instruction. Parents do not expect their young children to sit patiently and obediently while they instill a stream of relevant grammatical rules and conventions, expecting that the toddlers would not only internalize the content but also apply and transfer that knowledge to a variety of novel situations and abstract conditions. Rather, learning is approached more holistically, driven by the child's wants, needs, interests, and capabilities. In this type of environment, learning is purposeful—the toddler needs to communicate when she is hungry, thirsty, or tired—and the ability or inability to communicate has real, meaningful consequences for her. If she does not manage to convey her needs, she will not satisfy them.

Applying a similar analogy to older learners, consider the ways in which teenagers learn to drive. Educators or parents do not lecture students on the rules of the road, administer a quiz, and then hand them the keys to a vehicle. Rather, they use a more balanced approach, combining both direct instruction (explaining how to operate a car) and experiential learning (allowing students to interact directly with the vehicle) while scaffolding through targeted critical advice ("try downshifting to second gear on this hill"), and opportunities for productive failure (balancing releasing the clutch with feeding the engine with fuel, often resulting in a stall). In this instructional scenario, we allow the students to be the metaphorical—and literal—drivers of the learning experience. They are allowed the freedom to authentically engage with the learning process, but are not abandoned and left to figure it out on their own. Classrooms should do the same; allow students to obtain a "learner's permit" for schooling.

Unfortunately, unlike with learning a language in the preschool years and learning to drive in high school, the traditional classroom has abstracted the learning process; some might claim that it has "perfected" instruction for maximum efficiency. In the traditional classroom, learning is no longer dependent on the immediate needs of the learner and the environmental context in which the learning takes place. Something that might take months or years to learn experientially is distilled into a single 40 minute lecture. While boiling down instruction to its most elemental components might minimize tangential distractions and increase the volume of content (and therefore the breadth of coverage of the domain), it could also leave the learner with a contrived view of the lesson purpose and an abstracted view of her world. Sadly, even in classrooms which attempt to recognize the importance of authentic applications—such as classrooms that integrate project-based learning approaches—those interactions are largely contrived and sanitized to the point where the student's experience is almost ancillary to the project. The learner experiences only a summative view of the content, synthesized and articulated from another person's point-of-view, depriving her of the opportunity to

construct her own knowledge and understanding of her world through personal experience, engaging in productive failure, negotiating understanding with societal constraints, synthesizing the content, applying newly created knowledge to alternate situations, or evaluating its accuracy and importance in the domain.

Cognitive science researchers Bransford et al. (2000) support this view, finding that traditional curricula are problematic. Too often, curricular content is compartmentalized and educators introduce instruction as discrete, stand-alone learning activities instead of presenting a web of interrelated and interdependent pieces of a larger network as it is in the outside-of-school settings. When instruction is presented in isolation, students may be learning only the routines related to the content (e.g., mathematical operations, biological processes, rhyming patterns) and lose sight of the meaning and relevance of the content in the context of its application in the natural world. This limits the ability for students to transfer and apply their knowledge to other domains, and therefore deepen understanding (Bransford, 2000, p. 139).

Considering all of the above, the LEAP model encourages interdisciplinary approaches to foster creative activity, drawing on both the student's experiences and social context as well as including the learner's voice in the learning path design. To that end, the following section describes how, and why, the LEAP model incorporates four key elements into its design:

A. Epistemic Agency and Differentiation
B. Fostering Creativity
C. Collaboration in a Socio-Cultural Context
D. Integrated Instruction

Element A: Epistemic Agency and Differentiation

Two theoretical foundations of the LEAP model are constructivist theory (the belief that learning is a largely internalized process in which people generate their own meaning of the world through individual constructs) and constructionist theory (a learning theory that is rooted in constructivism but also recognizes the importance of social context and the generation of learning artifacts). As closely related as these theories are, they are posed as distinct and separate from each other in academic literature. For example, Yasmin Kafai (2006) makes a clear distinction between the two in spite of their interrelatedness by emphasizing that Piaget did not design constructivism to be a learning theory or model (Kafai, 2006, p. 35). The consequence of this is that practitioners might take a dogmatic approach to adherence to the theory and miss opportunities for learner understanding. Instead of differentiating the two theories, the LEAP model integrates them.

In both theories, learning is believed to occur within the individual—or, more precisely, knowledge is not received but rather produced within—and is necessarily part

of a personal, intimate process. Because of this, it becomes important that, in practice, the learners both assume the role of arbiters in their own learning paths and participate in the design and execution of those learning experiences. Simply put, students should have epistemic agency—in its purest form, assuming control over their own knowledge advancement—the creation of which is a result of a variety of influences, including the learning choices the students make for themselves (Damşa, 2010). In traditional classrooms, the instructor both manages and directs the cognitive elements of learning, including problem solving, knowledge acquisition, and prescribed skill development. While it might be possible for a skilled and experienced educator to navigate and balance her own role in being a source of content knowledge and providing appropriate direction and scaffolding for learning, the conflicting demands on teachers makes successfully providing opportunities for deeper instruction unlikely. Shifting roles from setting learning goals, observing student progress, and assessing mastery to one in which direct instruction is supplemental to supporting seemingly uncertain, student-driven and inquiry-based epistemic goals is a task for which many teachers are unprepared (Erkunt, 2010, p. 38). In spite of this, ceding authority over learning design to students also benefits teachers by increasing both intrinsic motivation of students and instructional differentiation opportunities. And, while many traditional teachers do work to build intrinsic motivation and differentiate instruction, many do not realize that students might hold the key to the solution.

> At the same time, the notion that students should take charge of the highest-level regulatory functions of the classroom—functions such as evaluation of progress in understanding, curriculum coverage, and so forth—are still considered the exclusive domain of teachers and curriculum experts. The challenge is to identify the kinds of distributions that are educationally effective, and then to search for ways that they can play a more central role in day-to-day classroom activities. (Hewitt, 1998, p. 81)

Essentially, educators can relieve many of their growing instructional responsibilities by embracing the shift from a teacher-directed environment to a student-designed environment. And, of course, the benefits of such an environment extend beyond improving the instructor's experience in the learning process. The impact is highly visible on the student side, as well.

Many popular models and approaches purport to aid in differentiation and allowing student-centered instruction, but a number of them do not reach the necessary depth to truly claim a structure which supports epistemic agency. While project-based learning, problem-based learning, cooperative learning, and guided discovery do provide opportunities for students to engage more personally with the content and can be self-directed to varying degrees, they do not inherently encourage students to generate or advance knowledge beyond what is seen in a traditional classroom (Erkunt, 2010, p. 38). More and more, what is seen in the traditional classroom is the aforementioned tension between policies that emphasize common standards and opportunities for true

differentiation. Without differentiation, there is no guarantee that students will not be "left behind." However, the assessments used to identify those left behind tend to focus on rote learning and are at odds with personalized, differentiated, and student-directed learning.

Further, what is missing from such policy is the acknowledgement that those being left behind are not necessarily those struggling. Students who have exceptional abilities in a variety of content domains, in fact, are left behind when most resources, expectations, and policies target marginally-performing students.

More specifically, an effective model should avoid the "lowest common denominator" trap where instruction targets the lowest performing skill level in the classroom in order to ensure that all students are progressing. When teachers are required to teach specific skills based on grade level expectations, students who have already mastered those skills may not be challenged to exceed those expectations. By introducing a somewhat radical approach to differentiation with LEAP—allowing the students to participate in the development and design of their own learning goals and products—the benefits of differentiation can be reaped by all students. All learners can demonstrate cognitive unevenness, or mixed skill levels of proficiency, across domains, so differentiation—not tracking—is instrumental in providing challenging and comprehensive instructional opportunities for *all* students, not just those at risk of being "left behind." The practice of leveling (grade level expectations) and tracking (homogenous grouping based on perceived ability), which remains commonplace in American public schools to this day, is an attempt to differentiate, but only at the group level. Although it has been shown that tracking students into homogenous groups is detrimental to students at both ends of the spectrum, differentiation is still valued—both in remediation and in advanced instruction—so tracking remains.

Even in remediation, however, it is increasingly accepted in the instructional design domain that knowledge acquisition isn't the ultimate goal. Rather, the ability for a student to discern what knowledge is needed in order to actively participate not simply as a learner but also as a practitioner in a domain is equally—if not more—important. Instead of a system where students spend an educational career amassing knowledge, and then applying that knowledge to an authentic task only when one becomes a practitioner in the field, Brown and Adler (2008) support the inclusion of situated learning—or learning in the field—through John Dewey's concept of *productive inquiry* (Brown, 2008).

They build upon the idea of productive inquiry by arguing for a shift in learning dynamics, particularly in relation to knowledge acquisition and development. Specifically, they call for the building of an environment or community where learning is initiated through a need to participate in a practice (demand-pull) instead of building an inventory of knowledge with no immediate purpose (supply-push). A demand-pull environment

allows learners to engage with others in communities of practice, where learning is motivated by passion and not by external forces (Brown, 2008).

The demand-pull approach to knowledge generation is also relevant beyond the walls of a classroom. According to research conducted on an international level, many students are neither prepared for the workplace nor demonstrate adequate life skills, and learning how to regulate one's learning and take initiative in the learning process can be buoyed by environments that support inquiry learning. Inquiry learning not only encourages learners to initiate the learning process, but also occurs in authentic, collaborative, experiential settings which provide the students with relevancy (de Jong, 2006). The Partnership for 21st Century Skills supports this view by emphasizing the importance of self-directed learning and problem solving. It calls for opportunities for students to learn how to apply tools to solve problems both independently and collaboratively, while remaining flexible and persistent as they work through failed attempts at problem solving. (Partnership for 21st Century Skills, 2007).

Learning in this type of environment can allow students to more readily transfer their knowledge to future workplace settings and can be accomplished within the context of an individual classroom. However, there is not necessarily one "right" way to achieve this. While some may believe that there is one correct approach to instruction and learning, researchers now recognize the benefits, and argue for the inclusion, of *epistemological pluralism*, acknowledging that there are multiple paths to understanding and a balance of both "hard" (distanced and abstract reasoning) and "soft" (close and concrete reasoning) approaches can be effective (Resnick M. , 2006, p. 10).

In light of this, it should be noted that while student-directed learning and inquiry learning practices to go hand-in-hand, there is no reason to limit learning opportunities to only self-organized and directed endeavors. Contrary to what might be believed about constructionism, it is not contraindicated to, nor discordant with, direct instruction. Constructionist activities or inquiry learning approaches need not be adopted at the expense of a foundation of factual and procedural knowledge. Rather, a solid knowledge base should be treated as the medium with which students learn.

> The opposition of constructionism to instructionism often aligns constructionist learning with discovery learning - as learning without curriculum in which the child discovers principles or ideas by him or herself. A common myth associated with constructionism is the idea that all instruction is bad […] Constructionism has articulated a more distributed view of instruction, one where learning and teaching are constructed in interactions between the teacher and students as they are engaging in design and discussion of learning artifacts. (Kafai, 2006, p. 36)

It is through this student-teacher engagement where direct instruction retains value in the classroom. But it is important to find an appropriate balance between the demand-pull and the supply-push—and "hard" and "soft"—approaches. Unfortunately,

finding the correct balance can be difficult for practitioners to achieve. Theories are often not packaged as working models, so educators may struggle to find effective implementation methods (de Jong, 2006, p. 533).

The LEAP model not only accommodates both self-directed and direct instruction, but it allows the balance to be determined and negotiated based on student needs.

Element B: Fostering Creativity

As described in great length in the Partnership for 21st Century Skills report, creativity and divergent thinking not only are instrumental in providing a strong foundation of core cognitive skills, but also are necessary aspects of productive members of the future American workforce. "For ages, traditional education, with its emphasis on rote learning and memorization of static facts, has valued conformity over novelty of thought. But in today's world of global competition and task automation, innovative capacity and a creative spirit are fast becoming requirements for personal and professional success" (Partnership for 21st Century Skills, 2007). Unfortunately, the traditional model of education is not an uncommon occurrence in American public schools—even in the 21st Century. Classrooms emphasize convergent thinking at the expense of divergent thinking and conformity at the expense of innovation (Sawyer, 2012, p. 389).

Historically, teachers have discouraged the types of behaviors often associated with creativity, leaning more toward behaviors which convey order and control. Research by mid-20th century creativity research Ellis Paul Torrance (1965) supports this view. In his interview of teachers in five countries, he found that teachers discouraged practices which are now associated with creativity. Specifically, teachers disapproved of students asking questions, taking risks, challenging opinions, forming their own opinions, and making educated guesses (Torrance, 1965). Since that time, more progressive periods in education have resulted in attempts to change this model and increased emphasis has been placed on cultivating creative approaches. However, while teachers may want to foster creativity in their students, they are limited by the school climate, curriculum, and assessment guidelines.

Unfortunately, with the exception of a handful of experimental schools, such attempts have not met with success. Specifically, despite the insertion of creative pedagogical approaches into the curricula, these attempts are simply superimposed over a dysfunctional Cartesian model where the student is the recipient of the teacher's fountain of knowledge. Although great attention has been paid to altering the ways in which students engage in the learning process, and attempts have been made to develop inquiry and critical thinking skills as well as provide real and authentic experiences, these attempts will always be limited by the framework in which they are integrated. In light of this, the LEAP model addresses not only the instructional content covered and the

pedagogical techniques employed, but also the environmental framework in which they are delivered.

Although it might be romantic to consider creativity to be an inherent talent that occurs after a moment of inspiration, research suggests that the opposite is true. Instead of the overly-simplified flash of creative inspiration, creativity should be perceived more as a process, and one that can be taught, encouraged, and fostered in the classroom. The process itself consists of a series of evaluation loops—both self-evaluation and peer-evaluation. Because of this, it is important that any instructional model be considered a temporal endeavor and allow for a significant period of time to foster the creative process. It is equally important that the process be considered non-linear in nature in order to accommodate new discoveries and approaches resulting from the evaluation cycle (Sawyer, 2012).

Evaluation loops are a valuable tool for the creative individual. By reflecting on what was attempted and how it was attempted in relation to the outcomes in a self-aware manner, individuals can refine their own creative processes, which also can be considered a meta-cognitive or epistemic activity. By using evaluation loops as a formative process, instead of as a summative process, students can develop an eye for critical review as they are generating knowledge instead of after it has been solidified in their minds.

Providing an evaluation loop allows for productive failure. Sawyer sees this as an essential component of the creative process. “Many creators say that the best way to have a good idea is to have a lot of ideas, and then just get rid of the bad ones” (Sawyer, 2012, p. 131). There is an inherent risk in allowing students to define their own problems—and therefore have greater autonomy when defining their learning paths—so time to allow the process to result in success necessitates a willingness to “fail” in the interim. This risk, perhaps, is most troubling for the student. As Hargreaves describes, “There is risk to individual students: …a major barrier to creativity is fear of the unknown, ridicule and failure, so engaging creatively may be a source of anxiety. These fears are very real for students who have invested a great deal of time, effort and increasingly money in their studies” (Hargreaves, 2008, p. 230). However, it is also found that “uncoupling” creative tasks with assessment reduces this anxiety and, therefore, risk.

One final consideration when recognizing the importance of ample time in a creative process is an incubation period. Allowing “down-time” for quiet reflection and “back-burnering” an idea often results in creative breakthroughs. Traditional classroom models are scheduled in such a way that they do not allow for periods of disengagement, resulting, perhaps, in reduced creativity. 40 minute class periods with specific educational standards to be met—day after day—minimizes opportunities for students to reflect on and connect with the content in a personal way. The challenge is that even if prescribed “periods of incubation” were to be integrated into the schedule, it likely would not result in increased creativity since incubation does not occur at a single point during the creative process, and it cannot be predicted in advance (Sawyer, 2012). Therefore, like other

models and approaches that provide a top-down solution to instructional obstacles, a contrived teacher-initiated schedule of "incubation time" wouldn't be effective in practice. It needs to be respondent to the individual student's needs, cognitive processes, and goals, allowing for knowledge generation at a pace which is most efficient for the learner, and one which only the learner could regulate. Because of this, the LEAP model allows for the individually-scheduled tasks within block periods of instructional time. Each student's project schedule will not only vary in plan, but will vary in practice depending upon what is learned during the self- and peer-evaluation loops.

Much like with epistemic agency, models and approaches abound which focus on developing—or at least acknowledging—creativity and creative approaches to instruction and learning. And, as with models and approaches that allow for epistemic agency, they are not ineffective, per se, but rather not necessarily comprehensive nor able to deliver on their promised results. Cooperative learning (collaborating to complete a task), teaching for transfer (applying knowledge to diverse situations), project-based learning (solution-oriented activities), and authentic teaching contexts (relevant and purposeful learning) are effective pedagogical strategies. However, used in isolation, and not in the context of policy and current assessment measures, the approaches are often displaced by more pressing testing concerns. (Partnership for 21st Century Skills, 2007).

Unfortunately, the Partnership for 21st Century Skills, like many other approaches originating in policy instead of in practice, does not delineate to practitioners *how* this can be accomplished. Providing standards and objectives is important—both for learning and for teaching—but layering them on top of existing Cartesian models of instruction in a high-stakes testing environment is, based on historical evidence of similar attempts at reform, bound to fail.

Element C: Collaboration in a Socio-Cultural Context

Constructivists characterize learning as an internal process. Construct*ionists* argue, however, that learning is necessarily a social activity and is influenced by the environment and context in which it occurs. A variety of social and cultural influences help to shape the perceptions and understandings that are formed by the individual learner. Because of this, an effective learning environment does not isolate a student as might commonly be seen in traditional classroom activities. Conversely, it provides a balance between activities which allow for quiet incubation and those which utilize the understandings, perceptions, and constructs of those with whom they collaborate. "It is tempting to paint a picture of a cognitivist classroom with individuals working silently in their seats, employing individual testing and grading practices. The situative classroom, in contrast, has students collaborating and engaged in group work" (Hewitt, 1998, p. 81).

Although collaborative activities are not new to K-12 classrooms and various manifestations have existed for decades (e.g., cooperative learning, pair and share, class meeting, etc.), they never fully exemplified the value that more contemporary

approaches have demonstrated. Instead of emphasizing the level of engagement and the act of collaboration, modern examples of effective collaboration focus primarily on the artifacts of learning and the effect on learning itself. Knowledge-building (collaborative generation of knowledge), project-based learning, and the flipped classroom (using instructional time for collaboration and discussion and independent time for lower-level knowledge acquisition) are all examples of approaches that depict a situated classroom and which demonstrate that collaborative activity is a means to an end and not an end in itself.

In addition to the cognitive benefits that collaborative activities have on learning, there also remains the need for students to become active problem-solvers outside of school. "Finally, we need to know how to reach out to others to tap their expertise to solve the complex problems we face today. Advances in cognitive science support the notion that problem solving has a social dimension" (Partnership for 21st Century Skills, 2007, p. 14). In fact, Brown and Adler (2008) argue that it is imperative that students participate in instructional activities that center not on learning about the domain, but rather learning how to participate within that domain. (Brown, 2008)

However, while social activities provide great benefit in the learning process, they should not be included to the exclusion of effective use of independent activities. Too much emphasis on social constructionism will minimize the importance of individual contributions to a domain (Resnick L. , 1991). But is such a view warranted in all aspects of learning? After all, it is accepted among researchers that creativity does not happen in a vacuum. In order for creative activities to flourish, they must be considered in the environment in which they occur. For the most part, that environment consists of a broader community within which the individual is participating, either knowingly or unknowingly.

The distinction between individualist and sociocultural approaches to understanding creativity lies in the importance placed on that environment. Creativity researchers Teresa Amabile and Mihali Csikszentmihalyi (1999) use the *Systems Model of Creativity* to untangle the relationship between the two. Specifically, the model is comprised of three separate entities: the person, the domain, and the field. During the creative process, all three entities are at play, while still retaining their own unique qualities (Csikszentmihalyi, 1999).

Similarly, the McWilliam and Dawson instructional model recognizes the relationship between the individual and the broader environment. "First generation or big 'C' creativity locates the creative enterprise as a complex set of behaviours and ideas exhibited by an individual, while second generation or small 'c' creativity locates the creative enterprise in the processes and products of collaborative and purposeful activity" (McWilliam & and Dawson, 2008, p. 633). This model is aligned with Sawyer's, Amabile's, and Csikszentmihalyi's, perspectives. Namely, that both individual creativity and sociocultural creativity are integral components of the creative process.

Individualist creativity—largely a western perspective—is rooted in the idea that creativity is an inherent, interior process that comes from within. Hallmarks of an individualist perspective of creativity include specific personality traits, elevated IQ, significant expertise in the domain, and intrinsic motivation. The individualist perspective focuses on how to encourage creativity within an individual through appropriate "solo" instructional activities including, for example, participation in the arts. Research supports the individualist view showing, for example, that there is are greater number of per-capita patents issued in countries which are characterized as more individualistic (Sawyer, 2012).

Conversely, the sociocultural perspective of creativity is rooted in the idea that the creative process cannot be removed from its cultural environment and necessitates a certain level of group interaction. Sawyer defines the sociocultural perspective of creativity as "the generation of a product that is judged to be novel and also be appropriate, useful, or valuable by a suitably knowledgeable group" (Sawyer, 2012, p. 8).

If one accepts that definition, it is important to recognize that creativity exists only in as much as it is valued by those in the community. A product or process can be novel, but unless it is deemed valuable by others, it cannot be construed as creative or innovative (Sawyer, 2012). Csikszentmihalyi agrees: "If creativity is to retain a useful meaning, it must refer to a process which results in an idea or product that is recognized and adopted by others. Originality, freshness of perceptions, divergent-thinking ability are all well and good in their own right, as desirable personality traits. But without some form of public recognition they do not constitute creativity" (Csikszentmihalyi, 1999, p. 314).

While recognition of the value of a creative product is key to the creative process in a sociocultural approach, it does not negate the recognition of the individual in that process. In fact, group process creativity relies heavily on the individual contributions of its members. Sawyer found that group creativity is centered on "distributed cognition" where individual member contribute separate, integral pieces of the solution to form one collective product (Sawyer, 2012). It is for these reasons that the LEAP model utilizes an interdisciplinary approach, one which taps into both individualist and sociocultural perspectives providing opportunities for both collaboration and independent work.

Additionally, Sawyer found that the more diverse the group is, the more creative its products are. In practice, diversity provides opportunities for divergent opinions, which can result in increased creativity and deeper cognitive processes. Interestingly, this is also the foundational component of knowledge building, a student-centered, task-oriented approach which fosters a collective inquiry collaboration. Knowledge building occurs both in the classroom and in a digital or online environment known as the Knowledge Forum, but remains a very socially-grounded activity in both settings. In a knowledge building environment, students generate collective knowledge by building upon each other's

ideas. The knowledge building approach also makes use of inquiry-based strategies and has been shown to be successful for both high-achieving and struggling learners (So, Seah, & Toh-Heng, 2010, p. 480).

However, like many other models and approaches, it is not clear how utilizing this approach in the classroom will meet the goals of current policy. Additionally, the Knowledge Forum is a closed environment, so there remains risk that students are generating knowledge that is not accurate or provides no contributions to the domain.

Such a closed environment raises another question about the grouping of students in productive activities. In discussing the "optimal" group, Sawyer provides several cautions. First, diversity in the group should be cognitive, not based on ethnicity, gender, or socio-economic factors. Having an appropriately balanced heterogeneous group will result in more ideas. Second, group members should find and promote a shared sense of purpose and commitment. It is difficult to imagine learners sharing a sense of purpose and commitment without having influence over defining that purpose and what constitutes commitment. Therefore, teacher-orchestrated groupings may not be as effective in recognizing the benefits of collaborative activities (Sawyer, 2012). When students find a shared sense of purpose and define common standards for participation, both productivity and commitment can increase.

Facilitating the process in group work is also important to consider prior to implementation. Studies have shown that certain group tasks—such as brainstorming—can result in reduced creative outputs. The reasons for this varies, but include reduced individual time allotted for contribution, participant anxiety, and divergent opinions about the goal of the activity. To remedy this, Sawyer recommends the following to avoid production blocking, topic fixation, and evaluation apprehension: 1) clearly specifying the goals; 2) using a trained facilitator; 3) using electronic brainstorming; 4) using groups to select ideas (Sawyer, 2012).

In spite of the wealth of research supporting the use of collaborative activities in the classroom, practitioners once again lack clear direction on how these theories and mandates can be readily executed in the classroom. The primary challenge is that, too often, collaborative activities are centered on lower-level cognitive activities instead of higher-level knowledge generation. Distributed learning is effective only in as much as the teacher can sufficiently monitor the students' progress and define goals, rather than just allowing the students to share ideas. The collaboration must allow for knowledge advancement, both on a personal and a group level (Hewitt, 1998, pp. 81-82).

Element D: Integrated Instruction

The final element of the LEAP model focuses on the integration of content domains (or subject areas) in a unified and meaningful way. Much like collaborative approaches, cross-curricular instructional integration approaches have been present—to

varying degrees—in American classrooms since the 1970s. However, the extent to which they are applied, and the ways in which they are integrated, falls short of what could be characterized as a comprehensive approach. Instead, piecemeal efforts to draw connections between—for example—arithmetic and the solar system, or American history and poetry, result in artificial and forced representations of the interdependency of domains. Instead of demonstrating to students the connections between the fields of knowledge and capitalizing on authentic illustrations of interdependency, not just similarities, interdisciplinary approaches often are little more than inauthentic ties between distinct and isolated content areas. As previously described, this compartmentalization of content areas, according to Bransford et al., can have detrimental effects, resulting in the students learning routines and facts in lieu of a more global view of the objects of learning as a whole. It is only until students understand the context in which content is situated that they will be able to apply that understanding in authentic ways (Bransford, 2000, p. 139).

The Partnership for 21st Century Skills framework also emphasizes the importance of content integration. Not only does it represent the domains in an authentic way, but also it provides context and motivation for the student to recognize the importance of the instructional goals. "Interdisciplinary work often draws on a real-world context, because as we all know, real life issues don't restrict themselves to knowledge from just one subject domain. While teaching for transfer helps answer the eternal student question 'Why do I need to know this?' interdisciplinary work can help students see the essential connections between bodies of knowledge, and more fluently synthesize disparate domains" (Partnership for 21st Century Skills, 2007, p. 10).

Research supports the inclusion of content integration approaches to encourage divergent thinking. Specifically, the research demonstrates that not only do interdisciplinary approaches provide context in an authentic setting, but also it can positively affect cognitive processes. "When the arts are integrated with instruction in another content area, such as math or science, that other content area is learned more effectively […] The claim is that when the arts are integrated with instruction in other content areas, learners achieve a deeper understanding, acquire an ability to think more flexibly using content knowledge, and develop enhanced critical thinking and creativity; the arts help teachers engage students more deeply, and reach a broader range of learning styles" (Sawyer, 2012, pp. 391-392).

Central to this idea is cross-pollination, or cross-fertilization. When individuals are working on multiple projects in separate domains, they are able to connect these activities in meaningful ways. Individuals may draw upon and adapt techniques or methodologies from one domain and execute them in a different domain. This application and adaptation requires that the individual reorganize their cognitive processes to accommodate constraints of the second domain. In a way, learners construct analogies between the domains, enabling them to perceive patterns that would not emerge had they not engaged with two domains. For example, when students apply their

understanding of musical rhythm and tone to the analyzing of poetry, they more fully can comprehend cadence and lexical stress, and how those could be manipulated to affect lyrical flow and meaning. It is these connections—this reorganization of thought—which are indicative of the creative process, a process which is heavily emphasized in 21st Century Skill development. Or, more to the point: "A network of enterprises increases the likelihood of cross-fertilization across projects, and many of the most important insights happen when two different projects come together unexpectedly" (Sawyer, 2012, p. 376).

This insight is particularly important outside of school in terms of innovation and building expertise. Through interdisciplinary activity, students can also more readily prepare themselves for participation in authentic activities, deepen intrinsic motivation, and develop the flexible thinking skills they need in order to participate effectively in personal, civic, and professional endeavors. Unfortunately, it also has been shown that effective integration across subjects "lags behind" (Partnership for 21st Century Skills, 2007, pp. 8-10). So can, and does, effective integration happen in schools?

One well-established approach that is gaining traction is *Project Based Learning*, or PBL, which is an important aspect of LEAP. The premise is simple: provide students with holistic, authentic opportunities to find solutions to existing problems. Doing so helps the students to make connections between the content and experience—or "teaching for transfer"—resulting in the increase both of memory of content and a greater understanding of the subjects (Partnership for 21st Century Skills, 2007). Project-based learning activities, in their perfect form, are largely student-directed. The learner not only produces a learning artifact (or project), but also is actively involved in defining the problem the project will address. Learners collaborate in groups to negotiate the solution, and the solution can come in many forms, both tangible (e.g., a functioning model) or conceptual (e.g., a plan to increase community involvement in their school). Lastly, the project is rooted in real issues and is not necessarily tied to one content area since true problems rarely are limited to a single domain.

Often, educators integrate project-based learning approaches, but not necessarily in a way which allows for maximum instructional benefits. Unfortunately, in practice, the execution of project-based learning can look very different than how it is designed. Instead of focusing on the learning processes at play during the execution of the project, teachers often emphasize the final product or artifact. "Most classrooms can be characterized as 'task-based' because the focus is on completing tasks such as story-writing, project-building, math exercises, and so forth" (Hewitt, 1998, p. 82). Additionally, classroom teachers may ignore some other significant components of project based learning. They might organize students into groups based on teacher-defined needs instead of student-centered interests. They might define the problem for students to solve and provide rigid requirements for project artifacts. And, instruction can be isolated to one content area, overlooking meaningful learning opportunities that surface naturally during the project.

Contrary to how it has been applied in practice, project-based learning is not simply a stand-alone tool that individual educators might work into their instructional repertoire. It can also be an essential component of more comprehensive models. In fact, many curricular models have adopted PBL approaches as a pillar of their framework as they provide motivating and authentic experiences for students to hone their skills (Kafai, 2006, p. 45).

For example, a knowledge building environment is a natural fit for problem-based learning approaches.

> In comparison, the focus of the Knowledge Building Community is on advancing knowledge. Conventional school tasks may still be involved, but these are now subordinate to engagement in a collaborative research program with the goal of advancing both individual and collective understanding. Participants develop greater competence in a particular subject area, using what group members already know as an important component, and co-constructing plans of action to extend that knowledge. Much like an academic research community, this involves talking to more knowledgeable colleagues, reading relevant resource materials, posing questions, offering theories, conducting experiments, and generally working with peers to make sense of new ideas. Individual understanding is thus driven forward by the dual need to be familiar with the knowledge of others and to advance that knowledge (Scardamalia and Bereiter, 1997)." (Hewitt, 1998, p. 82)

In spite of the previously identified limitations of knowledge building, it provides a solid framework that could easily and readily encourage interdisciplinary approaches to learning and collaborating in an experiential, problem-solving context.

Another very successful model utilizing integrated approaches to instruction is the International Baccalaureate (IB) program. Comprised of over 3,300 schools in 141 countries, the IB program is lauded for its high academic standards, holistic approach to instruction, and its focus on creativity and epistemological freedom. Its framework, like the LEAP model, is student-centered and emphasizes interdisciplinary approaches to understanding their world. Unfortunately, critics claim that the IB model has flaws including that the progression through the school is disjointed, particularly at the middle years level, and that external exams and assessments are not rigorous enough to demonstrate student mastery of the content (Bunnell, 2011). Additionally, research has shown that educators at the middle-years level feel that while the program is highly conceptualized, they are left without substantive direction for how to execute the vision. While educators feel at ease with the substance—the "what"—of the IB program, they have a difficult time fully understanding the methodology—the "how"—of IB (Bunnell, 2011, p. 270). The final section (*Section III: Executing the LEAP Model*) will offer the "how" by providing a practical illustration of the model in action.

Section III: Executing the LEAP Model

Making the leap from conceptualization to implementation is challenging. Reconciling outcomes-based policies with input based approaches is a lofty goal. With the Bush administration's No Child Left Behind (NCLB), educators no doubt recognized that funding is directly tied to student performance, and those performance expectations were tied directly to high-stakes assessments, but the policy did not provide insight into how to achieve those goals. NCLB's successor, the Obama administration's Race to the Top, acknowledges that 21st century learning needs to evolve and move beyond performance-based assessments where schools should become "engines of innovation" to "personalize education for all students" at the classroom level (U.S. Department of Education, 2012). Unfortunately, it falls short of providing practical approaches to meeting those needs. This final section will provide a snapshot view of the LEAP model in action in an attempt to bridge the gap between instructional approaches and policy goals in an educator-friendly, "ready to wear" format.

LEAP Model in the Classroom: Elements and Approaches

To achieve this type of learning experience, the LEAP model integrates each of the elements detailed in Section II and makes use of a variety of instructional approaches. Before each of the elements is detailed in practice, it is important to visualize a high-level view of its use in the classroom. In practical terms, the LEAP model includes the following elements:

Table 1
LEAP Implementation Classroom Characteristics

Activity	**Description**
Educator Role	The teacher is no longer the apex of the classroom. Instead, students work in a combination of small group, whole group, and individual tasks with the teacher's primary role is that of a facilitator or "master" in a cognitive apprenticeship approach, providing scaffolding through questioning, targeted direct instruction, and contributing to the learner's instructional goals and plans. Effectively, instructors act as a bridge between the instructional content and the students' own experiences.
Standards Alignment	Students are provided with student-friendly standards or objectives to be covered during the course of the designated time-period (e.g., a month.) These standards and objectives are pulled from local, state, or national standards and include minimum grade-level expectations, but need not be limited to those standards designated for the student's particular grade. Additionally, the standards are rewritten at an age-appropriate reading level with technical language and jargon removed.
Project Planning	Students work collaboratively and with their teacher (individually, in small groups, or as a whole class) to identify ways to demonstrate their understanding of the content by the end of the month. These could be art projects, writings, computer-designed activities, skits, tutorials, etc. It is important that students develop their own plans (in consultation with each other and the teacher) in order to maximize intrinsic interest and ensure grade-level specific achievement.
Student-directed Learning	Students work in a combination of small group, whole group, and individual activities each day during the thematic cycle (the timeframe of each day and thematic cycle will vary depending upon local needs). During that time, students are allowed to shift activities at their discretion, but are also responsible for their own time management.
Teacher-directed Instruction	Throughout each cycle, educators transparently address the independence and time management skills needed through direct instruction. During the designated project time, the teacher conducts small group instructional activities covering any new content. For example (see Sample Learner Instructional Plan), on day six, the teacher may have scheduled three small group tutorial sessions based on the needs of the students: 1) Pythagorean theorem; 2) elements of plot; and 3) Greek philosophers.

	Participation in the tutorial sessions would be mandatory for some students (based on their teacher's assessment of their needs) and optional for other students (based on their own assessment of their needs).
Culmination	At the end of the project period, students conduct a final evaluation of the projects and invite family, school, and community members to see their work.

This type of instruction differs greatly from what one might find in a traditional classroom where content acquisition is the primary concern and the instructor is the decision-maker for all aspects of the learning experience. Differences between the LEAP model and the traditional classroom include:

- Project work is central, rather than peripheral, to the instruction.
- Content knowledge is generated, not absorbed.
- Students define their own problems, which lead to an infinite number of solutions and knowledge constructs. The role of the educator is to facilitate execution of the project plans, provide mentorship in an apprenticeship model, and provide content knowledge support in a differentiated manner.
- Students have opportunities to engage in authentic experiences instead of pseudo-experiential opportunities that are calculated and contrived.
- Flexibility in scheduling one's own time minimizes "wasted time" performing tasks that an individual student may already have mastered and maximizes instructional time.
- Differentiated instruction (and learning experience) occurs on many levels in a natural, authentic way.
- There is significant flexibility with regard to which methods, approaches, and models are applied in this environment. Experiences can be tailored to the needs of the local population.
- Students are the designers of their own learning experiences, and are provided with the opportunity to engage with topics they are passionate about and in ways that are reflective of their own learning styles.

To provide more specificity, Table 1 identifies each of the key elements of a successful model defined in Section II. It also includes instructional approaches and describes how each is incorporated into the LEAP model (denoted in **bold**). As previously discussed, the importance of balance in instructional approaches should be recognized

when differentiating instruction. The table, therefore, provides details about how the model provides a balance of approaches for each of the identified elements.

Table 2

Approach and Element Integration in the LEAP Model

Key Element of a Successful Model	**LEAP Model Approaches**	**Opportunities for Flexibility**
Meeting Policy Goals	Since *learner instructional plans* [LIPs] utilize a **backward design** approach, and educational policy related to instruction and achievement is largely outcome-based, there is a level of assurance that all activities will result in adherence to policy criteria.	The model is not tied to any specific current policy. As policies evolve, the LIPs evolve with them. Additionally, emphasis is placed on the learning process, not in the demonstration of mastery through high-stakes tests, so the policies are not driving the learning processes.
Meeting Societal Goals	The standards and objectives which students integrate into their LIPs can be adapted or replaced at any time. This allows for different standard sets (e.g., Partnership for 21st Century Skills, Common Core standards, individual state standards, etc.) to be replaced or combined into any single LIP, reflecting the immediate local and societal goals.	Students are no longer limited by standardized goals. In the traditional classroom, instruction focuses on only those goals, consequently creating an "achievement ceiling." LEAP allows students to integrate additional standards to allow for multi-level (from remedial to advanced) instruction and the inclusion of other domains of interest.
Substantive Reform	This is not a model which is an "add-on" to an already overburdened system and overworked educator. It replaces the traditional instructional framework and requires a significant conceptual shift in the perceived roles of educators and learners in the classroom.	Implementing the LEAP model need not require a major overhaul of policy or systemic procedures and standards. An individual teacher can implement and execute the model in her own classroom without disrupting other school- or district-wide routines.

Key Element of a Successful Model	LEAP Model Approaches	Opportunities for Flexibility
Synergy	The LEAP model unifies input-based approaches with outcome-based expectations through the LIPs. Also, it can readily integrate the best-practices of various approaches including **inquiry-based instruction**, **knowledge building**, **cooperative learning**, **blended learning**, the **flipped classroom**, and **backward design**. The model allows the instructor to exploit commonalities in theories, approaches, and models instead of being limited by contraindications. She can then scaffold that for learners through their LIPs.	Educators and learners need not integrate all of the identified approaches into each of the activities. For example, a learner may wish to work individually on one task in lieu of collaborating with peers. Alternatively, she alsomay utilize only certain elements of each of the approaches identified instead of implementing them in their entirety (e.g., making use of **knowledge building** approaches but not utilizing the **Knowledge Building Forum** digital environment.)
Customization	The LEAP model allows for customization and personalization at multiple levels: individual learner, the local community, and specific cultural characteristics.	Although the LIPs are customized and individualized, they are also collaborative and replicable. Learners can share their LIPs with students locally or globally through the Internet and adopt, repurpose, or build upon previous activities from other learners' LIPs.
Flexibility	The LEAP model can readily evolve with existing policy and theory by adapting the structure of activities and swapping objectives. In practice, the model is also flexible in that it allows for a variety of grouping options and effectively eliminates student tracking practices. Additionally, the LIPs are flexible.	Although the standards and objectives covered are flexible and can evolve with policy and theory, there is no reason not to include "retired" standards which fit the need of the student or local population. This avoids the proverbial "throwing out the baby with the bathwater" approach to classroom instructional reform.

Key Element of a Successful Model	LEAP Model Approaches	Opportunities for Flexibility
Practitioner-based (design research)	The LEAP model was originally conceived and beta-tested during the author's actual experience in a 5th grade classroom teacher, but has been refined and subsequently aligned to theory and policy.	LEAP is currently in its infancy and has not been scaled to other classrooms. While grounded theory and design research will help to refine the practical aspects of the model, it is necessary that it takes into account existing research and theory related to effective instruction.
Epistemological pluralism	The LEAP model embraces epistemological pluralism by integrating some of the most sound and effective approaches and theories including: **constructivism**, **constructionism**, **productive inquiry**, **knowledge building**, **demand-pull approaches**, **project-based learning**, **the situated classroom**, **cognitive apprenticeship**, **direct instruction**, **epistemic agency**, **blended learning**, the **flipped classroom**, and others.	A model supporting epistemological pluralism does not imply that *all* theories, approaches, and models are good for all students, communities, or situations. Additionally, it does not imply that concrete facts and domain knowledge are unimportant or irrelevant. Rather, it makes use of the best practices and approaches and treats the factual content as the medium with which students learn to learn.
Epistemic Agency	Learner Instructional Plans are based on student interests and foster the skills needed outside of school. By trusting the students to actively engage in their own learning processes, we provide them with the tools to become lifelong learners.	While learners participate in both the design and execution of their plans and paths, they are not left to do whatever they wish. Drawing from the c**ognitive apprenticeship** approach, the instructor scaffolds learning experiences by providing constructive and meaningful feedback in ongoing, informal evaluation loops as well as through targeted direct instruction. This approach allows for working within policy constraints (standards, specific approaches, etc.) without negating the value of student agency.

Key Element of a Successful Model	LEAP Model Approaches	Opportunities for Flexibility
Differentiation	Instruction is differentiated for all learners, not only those with an individualized education plan (remediation or gifted.) This helps to remove the "instructional glass ceiling" that most students experience.	Although instruction and goals are differentiated, there remain common expectations and collaborative opportunities to reach those goals, and demonstrate understanding and mastery of the content.
Authenticity	The LEAP model provides authentic opportunities for students to interact with domains through projects that contribute to the field of knowledge and interactions with those already in the field. No work is to be for naught.	Authenticity need not translate to dry, boring, or antiseptic. Work can include fantastical, creative, and fictional elements as well. Authentic does not necessarily mean literal or empirical. As long as it has a real purpose (e.g., to entertain an audience wider than within the class), it is authentic.
Creativity	There are many elements in the model which support and foster creativity: it is non-linear, not temporally constrained (allows for periods of incubation), encourages the development of divergent thinking skills, allows for self-assessment and reflection cycles/evaluation loops; encourages **productive failure**; and it uncouples creative tasks with assessment.	While the LEAP model encourages creativity, it does not undervalue the use of convergent thinking skills when appropriate. This is particularly important when one considers that high-stakes tests tend to measure convergent thinking skills over divergent thinking skills.

Key Element of a Successful Model	LEAP Model Approaches	Opportunities for Flexibility
Collaboration	The integration of **collaborative activities** within a **situated classroom** allows students to generate their own views and personal constructs within the context of their community and culture. Knowledge generation stems from challenging those constructs, not internalizing others' constructs. Students are grouped based on learner-defined needs. By allowing learners to develop their own flexible, heterogeneous groupings, they will begin with a shared sense of purpose based on mutual interests and develop a shared commitment to the learning activity.	Not all activities can be, nor should be, collaborative. It is important to provide opportunities for independent reflection to allow for incubation, contextualizing social constructs, and to encourage creativity. Each LIP will contain a balance of collaborative and independent activities.

Key Element of a Successful Model	LEAP Model Approaches	Opportunities for Flexibility
Integrated instruction	Cross-domain learning can result in a sum greater than its parts. While students could learn about letter writing in an English class, space exploration in a Science class, and climate patterns in a Geography class, providing them with the opportunity to draw on **real experiences** and contribute to **real domains** could result in such creative products as 1) a letter to the editor of the New York Times about reaction to a recent scrubbed rocket launch; 2) fan fiction in a "letter exchange" format between Captain Kirk and futuristic NASA; or 3) a letter request and sample map sent to National Geographic to have their cartography team develop a "launch" climate map, identifying locations which are most favorable for a successful launch.	This does not imply that domain specific content and skills are not targeted nor isolated for in-depth analysis. Educators will continue to guide students in balancing depth vs. breadth and ensuring that there is adequate coverage of specific topics and objectives in the learner plans.

Part C: Sample LEAP Learner Instructional Plan

An excerpt sample student-generated LIP is provided in Appendix A for illustration. Included are examples of select 7th grade standards adopted by Pennsylvania in three content areas: Social Studies, Math, and Language Arts which relate to the theme "Ancient Greece". To implement the LEAP model, students would—in consultation with their teachers—examine the standards prior to instruction and develop *learner instructional plans* [LIPs] that, upon completion, will guide the students in demonstrating mastery of the standards and objectives for the designated period of time (e.g., week, month, marking period). Each plan would integrate learning opportunities across the content areas and directly address the learning standards identified. In executing this plan, students would work in a variety of group settings including individual research, collaborative artifact creation, and targeted direct instruction.

Challenges and Conclusion

This paper has demonstrated that a variety of educational theories and pedagogical approaches can be synthesized and complement each other in a unified practice. Constructivism and constructionism both lend themselves to effective classroom approaches including implementing epistemic agency, differentiation, collaborative learning, and integrated instruction.

Although the LEAP model is simple in design and has the promise for truly bringing classrooms into the 21st Century, there are a number of barriers which must be overcome. First, additional refinement and research into its efficacy needs to be completed prior to any large-scale acceptance or implementation. Although the model has been developed in tandem with its execution in a classroom, when one considers the landscape of competing priorities, programs, and demands, as well as the difficulty for any one model to gain traction and be sustained, sound research supporting its efficacy is critically important. Reform and implementation are not sufficient—efforts to sustain, monitor, and facilitate the program must not dissipate over time (Coburn, 2003).

Second, the role of the educator shifts so dramatically that there would need to be significant professional development and a shift in teacher preparation pedagogy in order to align teachers' perceptions with the reality of their new role in the classroom. Further, stakeholders including administration, parents, and policy makers must also recognize and embrace the new role of educators.

Third, similarly, students would need to be transitioned into their new roles with an emphasis being placed on time management, working effectively in groups to build knowledge, problem solving, creative approaches to content mastery, and personal responsibility. Although these skills can be built naturally through these roles, many students are conditioned to perceive their roles as passive consumers of education and might not yet have the faculty to fully embrace their new roles.

In spite of these challenges, the LEAP model has the potential to provide an environment that is responsive to needs of policy, the community, and most importantly, the learner. Reform and innovation addressing the needs defined in this paper are materializing within the education space. For example, 2Revolutions, a private design lab which launches and supports learning models, is spearheading educational reform by building a collaborative team of practitioners and innovators and has recently itemized specific aspects of a quality education including collaboration, individualization, critical thinking, problem solving, and real world skills (Kern, Innovating Toward New Learning Models, 2011). They have subsequently shared a framework which meets their vision and issued a call to the gatekeepers of other models and approaches to collaborate on building a mechanism that can "advance our shared goal of designing a new learning ecosystem that is capable of more fully preparing our young people for the future

challenges and opportunities that await them" (Kern, Designing the Future of Learning, 2012).

The political environment, for the time being, also is primed to embrace a model like LEAP. For example, one of the largest expenditures in public schools is special education. Education law and policies have largely favored inclusion over resource (or "pull-out") classes. The consequence is that classroom educators are left to determine how to differentiate instruction for students on IEPs while providing standardized instruction for the rest of the classroom. Implementing the LEAP model not only would allow for a seamless and favorable inclusion experience for the special education students, but it also would provide on-level and high-achieving students with the benefits of differentiation—not only without increased budget, but possibly with reduced costs overall.

Lastly, there also is evidence that policy not only is primed for reform, but is actively pursuing it. Race to the Top is encourages innovation at the classroom and practitioner level, rewarding those who have a direct understanding of the needs and capabilities of learners. The second phase of Race to the Top emphasizes the personalization of education for all students, not only those at risk of being left behind. Furthermore, its call for transformation is not solely at the district administration level, but emphasizes reform in each classroom as well (U.S. Department of Education, 2012). It is within such a reform-minded, learner-centered, practitioner-based environment that the LEAP model can thrive.

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Appendix A

Figure 1. Sample objectives/standards.

Theme: Ancient Greece

During the course of this theme, you will need to work both individually and with other students to create projects which show that you can do the following:

Language Arts

1. Write a multi-paragraph information piece in two of the following formats
    - Letter
    - Report
    - Instructions
    - Essay
    - Articles
    - Interview
2. Use two or more of the following graphics to support your information piece
    - Map
    - Chart
    - Graph
    - Table
    - Illustration
    - Photograph
3. Use primary and secondary sources.
4. Listen critically and respond to others with questions, ideas, information and opinions.
5. In a presentation, show awareness of audience by using appropriate volume and clarity.
6. Develop an inquiry-based research project.

Social Studies

1. Describe social, political, cultural, and economic contributions from people in Ancient Greece.
2. Describe how historical documents, artifacts, and sites are important to study.
3. Describe how Ancient Greece has impacted us today in one or more of the following areas:
    - Belief systems and religions
    - Commerce and industry
    - Politics and government

Math

1. Show trends and make predictions about data in a graph.
2. Create and answer questions that can be shown through data.
3. Organize, show, and interpret data.
4. Use three of the following to display data:
    - Histogram
    - Bar graph
    - Line graph
    - Stem-and-leaf plots
    - Circle graph
    - Scatterplots

Figure 2. Sample learner instructional plan.

Project Plan Excerpt ***Theme: Ancient Greece***	**Group**	**Direct Instruction**	**Objectives**	**Time and materials**
e.g. Research the origin of the Olympics using secondary sources. Compare and contrast to how the Olympics are conducted now using primary sources. Show the increase of country and athlete participation in graph form. Write a news article and record it as a reporter to share it with the class. *(separate rows for each project; students will likely have 2-3 projects)*	e.g., work with Kristina	1) making a line graph 2) help with research skills 3) difference between news article and other types of factual writing	SS #1 SS#3 LA #1 LA #2 LA #3 LA #5 LA #6 LA #7 Math #1 Math #3 Math #4	Video camera Internet connection Daily, over two weeks

Figure 3. Sample schedule.

Day	**My Schedule**	**Amount of Time**
1	*Begin Olympics origin research*	*45 minutes*
2	*Participate in line graph direct instruction* *Collect data about participation in the Olympics*	*20 minutes* *25 minutes*
3	*Create participation line graph*	*40 minutes*
4	*Participate in expository writing direct instruction*	*30 minutes*
5	*Collect five articles about the Olympics in the past 20 years*	*20 minutes*
6	*Draft news article* *Review news article with teacher*	*45 minutes* *10 minutes*
7	*Record news brief on video*	*20 minutes*