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Unleashing Creative Development

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Abstract

Creativity emerges out of a process of creative development. In part one I describe the framework of creative development and illustrate it with examples of well known individuals, showing how their creativity emerged through this process. In part two, I present thoughts about teaching and nurturing creative development, including specific curriculum suggestions. With education and support we can help individuals develop their creative potential.

Keywords: *Creativity, innovation, education, human development, human potential*

INTRODUCTION

Creativity is the root of innovation and the progress of human civilization. Creativity and innovation drive the dynamics of economic and cultural systems, and are the basis for business and global competitive advantage.

Unfortunately it is still the case today that many people never gain the opportunity to develop their creative potential. This has two unfortunate consequences. Many people neither have the experience of being engaged in creative activity nor the fulfillment of creating something. And second, society does not have as large a pool of creative contributions as it might, which retards progress and human development.

I believe we can do better and help people unleash creativity through education. My purpose in this essay is to outline a framework of creative development, and, tied to this, an educational curriculum through which students can learn to appreciate their own creative potential and how to develop it. My essay is divided into two parts. In the first part I outline the framework of creative development. In the second part I discuss implications and a framework for education.

I. THE NATURE OF CREATIVE DEVELOPMENT.

The nature of creativity is widely misunderstood. The most common image of creativity is a sudden flash of insight or inspiration – often depicted as a light bulb turning on or a bolt of lightning striking out of the blue. While such peak moments of creativity definitely occur, and are vital to creativity, they arise out of a rich process of development that is often not appreciated or understood.

I prefer a different picture of human creativity: A tree. The tree has roots, a strong trunk, a long process of development, and rich branching -- leading to a flowering of creativity. The image of a tree growing helps us understand that creativity emerges out of an organic process of development unfolding over time.

The process of creative development is a process of exploring creative interests, learning, evaluating options, having ideas and insights, engaging in creative projects, and reflecting upon one's creative work and development, triggering further development. Creative development is an iterative, open-ended process: over time a person engages in a series of projects, her interests evolve, and her creative focus and energy vary as she learns and grows, has experiences, and changes as a person. Creative de-

velopment is a process that every person can go through.

The Framework of Creative Development

I have developed a framework describing creative development through the empirical study of many individuals across many fields, including the arts, sciences, technology, business and entrepreneurship, and scholarship. The framework is a flexible one that encompasses many forms of creativity and different creative pathways. The framework is presented in *The Nature of Creative Development* (Feinstein, 2006). I am currently developing formal models describing this process (Feinstein, 2011, 2012; see Gabora, 2005, and DiPaola and Gabora, 2009, for related discussions comparing human and computer-generated creativity). The framework resonates with Howard Gruber's approach to the study of creativity (Gruber, 1981; Wallace and Gruber, 1989). More generally it is based on and resonates with the biographical approach to creativity (Holmes, 2004; Cohen, 2009; Simonton, 1988; Gardner, 1993). A few examples of outstanding biographies I have drawn on in developing the framework include Holmes' biography of Hans Krebs (Holmes, 1991), Blotner's biography of William Faulkner (Blotner, 1966), and Spurling's biography of Matisse (Spurling, 2006). Biographical and especially autobiographical materials inform my discussion of Albert Einstein, Alexander Calder and Charles Darwin below.

In simple terms we can describe creative development as a two-step process. The first step is the formation of a creative interest. The second step is the creative development of the creative interest through pathways of creativity generation and creative projects.

The formation of a creative interest is a key first step in creative development. A creative interest is a topic or issue that a person finds fascinating and believes has creative potential. Often a creative interest forms relatively early after beginning to learn about a field, as a person responds to what he is learning, to what sparks his interest and curiosity and excites him (Feinstein, 2006, Chapters 2 and 3). A creative interest is not a "standard" topic though it may start that way, but rather more distinctive and focused. A person defines his creative interest for himself, out of the building blocks of what he has learned and experienced. Thus he begins his journey to originality and creativity.

There are a variety of different kinds of creative interests. A creative interest may be a particular topic the person defines for herself – a unique set of objects, elements, people, works, or experiences she believes form a natural focus for creative development. A creative interest may focus on an interesting, novel perspective on a more standard topic, or on questions – often broadening out from a first question to a broader investigation. A classic form of creative interest is a "relationship interest" - an interest in pursuing the links between two different topics, for example the application of a methodology to a novel topic to which it has not previously been applied. Finally, a creative interest may be rooted more in guiding principles – exploring the development of a topic guided by a set of principles. In all of these ways creative interests are distinctive and are themselves creative.

Alexander Calder formed a creative interest in the solar system as the basis for art. His experience was sparked by a chance experience sleeping on a boat one night early in his career as an artist. He writes in his *Autobiography*, "It was early one morning on a calm sea, off Guatemala, when over my couch – a coil of rope – I saw the beginning of a fiery red sunrise on one side and the moon looking like a silver coin on the other.… It left me with a lasting sensation of the solar system" (Calder and Davidson, 1966, pp. 54-5). He told an art critic, "The basis of everything for me is the universe. The simplest forms in the universe are the sphere and the circle. I represent them by discs and then I vary them." In the introduction to one of his exhibitions he wrote: "From the beginnings of my abstract [art] work, even when it might not have seemed so, I felt there was no better model for me than the Universe. … Spheres of different sizes, densities, colors, and volumes, floating in space, traversing clouds, sprays of water, currents of air, viscosities and odors – of the greatest variety and disparity" (Lipman, 1976, pp.17-8; Feinstein, 2006, pp. 44-5; my discussion has been drawn upon by the Guggenheim Museum in their online catalogue description of Calder's creative work). Calder's description of his interest is a wonderful illustration of the richness that creative

interests often possess.

Creative interests develop over time, and in some cases a mature, rich, distinctive interest grows out of a more basic earlier interest. Charles Darwin loved to collect objects and specimens as a child. In his *Autobiography* he mentions collecting, among other things, coins, stamps, shells, birds' eggs and insects. In college he amassed an extensive beetle collection. A few years later, serving as naturalist on the *H.M.S. Beagle*, Darwin formed a far more conceptual, distinctive interest that grew out of his childhood interest. His creative interest focused on the geographic ranges of species, and how one species was replaced by another, closely allied or similar species beyond a certain point. The itinerary the *Beagle* followed made it natural for Darwin to form and develop this interest. The *Beagle* initially made land in the tropics, at Bahia. Darwin was stunned by the incredible diversity of life forms he found, such as brilliant butterflies. As the *Beagle* traveled south, entering the temperate zone and eventually sailing around the Cape and back up the western coast of South America, Darwin noticed how the life forms also changed, in regular patterns. Ever a careful observer, he noted the similarities and differences among relatively similar species occupying neighboring ranges (Barlow, 1945, pp. 177-9; Darwin, 1988, pp. 53-5, 77, 250, 272-3; Keynes, 1979, pp. 175-9; Darwin, 1989, pp. 41-80, 106-7, 217-9). His interest extended to the temporal range of species and extinction of species, replaced by others, often with similar but somewhat different morphology and behaviors (Feinstein, 2006, pp. 103-4; see also Gruber, 1981, p. 102). Ultimately, as the Beagle sailed across the Pacific and headed for home and he pondered his observations, Darwin developed his initial idea of "transmutation of species" as a way to explain the geographic and temporal patterns he had observed, including the famous examples of different finches and tortoises on the Galápagos Islands (Darwin, 1989, p. 246-7; see also Sulloway, p. 982).

Dozens of further examples of creative interests and their patterns of development are presented in *The Nature of Creative Development* (see especially Chapters 2 and 3).

The second step of creative development is creativity generation. There are two pathways in particular that are common ways through which creativity is generated.

One pathway is a creative response (Feinstein, 2006, Chapter 9). A creative response occurs when an individual encounters a new stimulus or has an experience that connects with his creative interest and with conceptual elements he has learned and internalized exploring his interest -- sparking a new idea or insight. Creative responses can be quite sudden and unexpected, and match the idea of an epiphany of creativity. However they are rooted in the creative interest an individual has developed. In the zone of intersection between a person's creative interest (specifically the conceptual structure the individual has built up through exploring his interest) and the novel stimulus or experience there is great creative potential. The creative interest may lead the individual to notice an aspect of the stimulus that most people fail to notice, sparking a novel insight. Or the person may make a creative connection between the stimulus and some element of his creative interest. Or the stimulus may resonate with a set of elements he has learned exploring his interest, that previously seemed discordant, leading him to recognize a novel pattern or a creative generalization.

A creative response Alexander Calder made during a visit to Piet Mondrian's studio launched a new branch of his creative development that led to his development of the mobile as a distinctive form of modern sculpture. Describing his visit in his *Autobiography* Calder writes that it gave him "a shock. A bigger shock, even, than eight years earlier, when off Guatemala I saw the beginning of a fiery red sunrise on one side and the moon looking like a silver coin on the other." He writes that he was inspired to pursue modern abstract art by Mondrian's studio and art – by the simple abstract forms he saw there. After painting in Mondrian's abstract style for a few weeks after his visit, he reverted to wire sculpture which in his words "was still abstract." Over the ensuing months he invented his first distinctive modern sculptures and later, as he added motion, the modern art mobile (Calder and Davidson, 1966, pp. 112-3).

Mondrian's studio resonated with Calder's interest in the universe (solar system) as the basis for art. In his studio Mondrian had *Wall Works*, simple

rectangular cut-outs in red, yellow, blue, gray and white taped on the walls. Standing in the studio gave one a three-dimensional immersion in Mondrian's art that went beyond seeing his paintings. A comment by de Kooning conveys a sense of the power of the studio – it was "like walking around inside one of Mondrian's paintings" (quoted by Holtzman in Mondrian, 1986, p. 9 and surrounding). Surrounded in this way by modern art, as the planets surround the sun, Calder had the realization that his creative interest could be pursued as a modern art theme (see Feinstein, 2006, Chapter 9 and specifically pp. 260-5 for further discussion).

It is noteworthy that creative responses are often sparked by particularly powerful and heightened experiences such as Mondrian's studio created for visitors. It is also noteworthy that Calder's visit to Mondrian's studio occurred eight years after his experience on the boat that sparked his creative interest. During that time his interest had been latent and not directly connected with his art work. Creative development takes time and follows a jagged course – one cannot know when one's interest will spark an important idea.

The other creativity pathway is connecting two elements one has encountered exploring one's creative interest, elements that have not previously been connected. Because a creative interest is distinctive and, like the piece of a jigsaw puzzle, has a distinctive conceptual shape, it leads a person to learn about diverse elements that have not previously been grouped or linked together. Thus by connecting different elements a person can make a valuable new creative connection.

Albert Einstein is a brilliant example of an individual who made this kind of creative connection. In his "Autobiographical Notes" Einstein describes a paradox he hit upon at the age of sixteen: "If I pursue a beam of light with the velocity *c* [that is, travel just behind the beam at the same velocity] I should observe such a beam of light as a spatially oscillatory electromagnetic field at rest [since he will be moving at the same speed as the beam it will, according to classical physics, not appear to be moving from his perspective, thus will be at rest]. However, there seems to be no such thing, whether on the basis of experience or according to Maxwell's equations." (Einstein, in Schlipp, 1949, p. 53.)

Unable to resolve the paradox, in the ensuing years Einstein developed a creative interest growing out of it. Interestingly, his interest had two lobes. One lobe centered on physics, specifically electrodynamics and a host of topics that he saw as related to this issue, including classical mechanics, thermodynamics, and the new quantum theory pioneered by Max Planck. The other lobe of Einstein's interest centered on philosophical conceptions of space and time. This lobe was quite distinctive for a young physicist, and proved to be crucial for his creative development.

Einstein was surely familiar with Newton's description of time in his great work *The Principia*. Newton's conception is inherently medieval, viewing time as "absolute" flowing "uniformly" and "without reference to anything external" (Newton, 1999, pp. 408-10). Beginning from that conception, Einstein explored more modern conceptions. He had been introduced to the work of Ernst Mach in college; Mach emphasized a critical perspective questioning the notion of any absolute abstract time. A few years later, working at the Swiss Patent Office in Bern, Einstein pursued the topic further. Einstein formed a reading group with a few friends which they called the Olympia Academy. We know at least some of what the group read because they kept a record (see *The Collected Papers of Albert Einstein, Vol. 2; The Swiss Years: Writings 1900-1909*, edited by John Stachel, 1989, pp. xxiv-xxv). The reading list indicates a remarkably broad foray into philosophy, including works by Plato and Spinoza, John Stuart Mill's *System of Logic*, and many others. Ultimately, Einstein read David Hume's *Treatise on Human Nature*.

Hume was a great early modern critical philosopher. In the section of his treatise entitled "On Space and Time" he argues that we have no direct perception of time. Rather, we construct our measure of time. We measure the "time" that elapses by reference to some second series of events. For example, when we say someone has been speaking for "one minute" we mean that during the time they have been speaking the second hand on a clock has revolved one full rotation. Hume gives the example of musical notes played in sequence giving a sense of time.

Einstein had been familiar with related critical

ideas expressed in Ernst Mach's work. But it appears based on the record including his own statements that reading Hume was decisive for him. Some months later he made a creative connection between Hume's idea that we construct measures of time and his paradox. The key insight was that the two observers, the first in his frame at rest, the second moving relative to the first, each defines their own time measure, using the same basic method – yet the two constructed measures are different and in particular an observer at rest perceives the clock of the second observer, moving relative to him, as running slower. (When the role of which observer is at rest and which is in motion is inverted the result is the same in the opposite way – again the observer at rest perceives the clock of the observer in motion as slower.)

Describing his moment of insight Einstein recalled that he was speaking with his friend Michele Besso. "Then suddenly I understood where the key to this problem lay. Next day I came back to him again and said to him, without even saying hello, 'Thank you. I've completely solved the problem.' An analysis of the concept of time was my solution. Time cannot be absolutely defined…" (Einstein, 1982/1922, pp. 45-7). Thus - after what he described as "ten years of groping" -- Einstein resolved the paradox and invented the theory of relativity.

The two pathways of creativity I have described and illustrated with examples are main pathways through which people generate creativity guided by their creative interests. Creativity is generated out of the exploration and development of creative interests, through experiences, creative responses, and making creative connections. Thus there is a logic to how creativity emerges out of a rich process of development, punctuated by moments of creative insight and inspiration.

Phases of Creative Development

Creative development has three distinct phases: (i) initial learning about a field and formation of a creative interest; (ii) exploration of creative interests; and (iii) engagement in creative projects. All three phases have creative elements and major creative steps can arise in each. Alexander Calder's development illustrates the three phases and the role of creativity in each. He formed his creative interest while traveling on a ship and his interest was itself a creative vision. Eight years later his interest sparked a creative response when he visited Mondrian's studio. And as he pursued his vision of the universe as the basis for modern art in a set of creative projects he made further innovations, adding motion to his sculptures, thus inventing the modern art mobile.

Each phase of creative development involves a distinctive set of activities and sensibilities. During the first two phases an individual tends to be relatively open to the world around him – open in a very broad sense in phase one while forming an interest, and open but in a more focused way during the second phase as he explores his interest. During the third phase in contrast, individuals tend to be more inwardly focused on their creative project. There is still much creativity that occurs during this phase, as Calder's development illustrates, including creative problem-solving, revisioning, and oftentimes through redefining a creative project multiple times.

Over the course of his full creative development, which can last a lifetime, an individual cycles among these phases. He forms new creative interests, existing interests evolve, and he engages in many series of creative projects. Thus creative development is a very rich, iterative, open-ended, evolving process.

It is easy to fail to appreciate the richness of this process, a fact which has important implications for education and the management of creativity. A creative idea or insight may strike in a moment. But it is rooted in and grows out of a long period of development, based upon creative interests and their exploration. It is easy to overlook the importance of creative interests, including the questions and principles associated with them, and the exploration of creative interests, as the basis for creativity. There is often a substantial gap between the formation of a creative interest and the creative contributions that flow from it. Indeed it is not uncommon for an individual to form a creative interest years before he makes his most important creative contributions – both Calder's and Einstein's developments illustrate this. A person's creative interest guides him along a winding path of development and is thus the original source from which his creative work flows, even if it might not seems so on the surface.

Finally, collaborative creativity is also often

rooted in creative interests. When two or more individuals collaborate, there is tremendous creative potential in the zone of intersection of their creative interests. Identifying this zone, and exploring it, is often exciting, and is a great way for a pair or a group to develop creative ideas and projects.

II. NURTURING CREATIVE DEVELOPMENT: A PROGRAM FOR EDUCATION

Viewing creativity as emerging out of a process of creative development unlocks what has often seemed a mysterious closed door to creativity, giving us a framework with which to build an education curriculum for creativity and an approach for managing creativity.

Every human being carries the potential to be creative, through immersion in a process of creative development oriented towards pursuing their own creative interests. Through education we can reach all these millions of people and help them unleash their creative potential.

Heretofore our educational institutions have not been very effective at unleashing this creative potential. To the extent that creativity is incorporated in the education curriculum, it is often as a "fun" interlude. Most commonly creativity is incorporated as one small element in larger topic, scattered throughout the curriculum. It is not actually taught as a subject but rather allowed or encouraged at scattered moments.

Although students may experience some creativity in this way, their experience is limited for two main reasons. First, often students are asked to be creative in relation to a fixed topic, not one they choose but one that the teacher designates. For example they might engage in an art project asking them to be creative, but in an overly directed manner, such as a self-portrait. Or they may be given the opportunity to be creative in relation to a writing or science topic that is assigned, such as writing a short story or a poem about a designated topic or exploring the properties of a chemical compound. In this situation students are not able to define the creative topic for themselves. This limits the nature of their creative development and in many cases will sharply reduce their motivation to engage in the project relative to the level of intensity they routinely bring to play and games outside of school. Indeed it is a striking feature of modern day childhood and adolescence that students are often far more creatively engaged with activities outside of school. The educational system thus misses the chance to engage children creatively at the level at which they are capable.

The second limitation is that students are not given the chance to experience the longer term process of creative development. When creativity is simply injected in isolated assignments into a curriculum that is mainly focused on other issues, it is not likely to be appreciated for the truly rich, integrative, holistic process that creative development actually is. It is this longer term, larger, richer process that is in fact the basis for genuine creativity and innovation, whether in the arts, sciences, business, design, or engineering. Ironically, the way creativity is currently approached in schools, students may emerge from the school setting more convinced than ever that creativity is mainly sporadic moments of inspiration and does not need to be systematically nurtured and developed.

Thus although there are many good intentions, the approach that has been employed towards creativity in educational settings is not likely to be effective and may even have deleterious effects.

A Curriculum for Creativity & Creative Development

We can improve the way educational institutions nurture and teach creativity through developing courses of study specifically focusing on creative development. As I envision it, such a course of study will be longer term, whether a few weeks, a term, an entire year or even longer; will build on itself and be more integrative; and will be a program in which creative development is the principle focus, not an aside.

To be successful a creative development program of study must incorporate several distinct elements and a diverse set of approaches. These should include theory, examples, engagement in the different phases of creative development, reflection on process, feedback, discussion, mentoring, and group activities. This approach follows in a long distinguished line of education theory that seeks to promote the development of the whole person through a mixture of theoretical instruction and

practical guidance tailored to the individual's needs and stage of development . Noteworthy contributors include John Dewey (1890, 1916), Maria Montessori (1912; see also Lillard, 2005), Lev Vygotsky (1978, original writing in 1930's) as well as many others. It is important to recognize that this is one line of approach fitting within the broader field of curriculum development (for overviews see Tanner and Tanner, 2007; Dillon, 2009; and the classic tract by Tyler, 1949). Curriculum development embraces so many dimensions, including many practical issues given the large scale of primary and secondary education, that a focus on creative development is often lost. Further, in the United States since the turn of the twentieth century there has been a significant focus on efficiency achieved through standardization of curriculum, a focus that has in fact been reemphasized in recent decades (see Au, 2011).

We cannot teach the full depth and process of creative development in school, even in a one year course of study. But like life in Plato's cave in *The Republic* (Plato, 1961, Book VII, pp. 747-72) we can help students gain an understanding and appreciation of what true creative development will be like through examples, stories, reflection, and engagement in smaller scale projects and possibly a capstone project. The goal of a course of study of creative development is for the student to gain the understanding and confidence to pursue his or her own creative development beyond school and help others pursue their paths of development.

In the scope of theory the objective is for students to gain an understanding and appreciation of the nature of creative development. Most important are aspects of this process that run counter to conventional views and are challenging. Thus it is crucial for students to gain a sense for the relatively long time course of creative development. The patience and ability to navigate the changing course and inevitable turns of fortune is vital for realizing one's creative potential, and is not necessarily intuitive. Similarly, the fact that creativity is not just a flash of inspiration but rather emerges out of a longer-term process is vital to understanding how to unleash creativity.

It is important to help students understand that creative development is very much self-guided, and that it is rooted in creative interests - that each person defines their own interests and pursues their own path of development. Students have typically engaged in multi-year growth-oriented activities, such as sports or learning to play a musical instrument. But they may not have made the connection between these activities, where the focus is more on mastery of skill, and the rich creative development process. Outlining the theory and providing many examples can help students appreciate how creative development contains both exploration and learning as well as creative projects.

While some examples may be universal, there is no reason students can't read about individuals and creative teams, organizations and projects they choose for themselves. After all, every student has her own interests and these should be the basis for her learning. Guided by an instructor/mentor/advisor, students can decide whom and what to learn about, and in what field, whether movie directing, creative writing, science, engineering, design, music, advertising, entrepreneurship, leadership, or some other venue. Students can then work out how the theoretical frameworks they are taught relate to the examples they learn about.

Central to a curriculum focusing on creative development is engaging in exercises and activities that provide direct experience of the different phases of creative development. Every exercise should have a well-defined function, and place in the curriculum in relation to theory, the other exercises, and student personal growth. Betty Edwards pioneered this approach in the context of art, setting it forth in her book *Drawing on the Right Side of the Brain* (Edwards, 1999), but it is valid far more broadly as she herself recognized (Edwards, 1999, Introduction). I have developed this approach for teaching business and general interest students about creativity and creative development in my class "The Practice and Management of Creativity and Innovation" at Yale.

Activities and exercises fall into two categories, and both types are useful. One kind is exercises that illustrate specific aspects and elements of creative development. For example, in my class I have students do several exercises described by Betty Edwards in her book. One of my favorites is the palm-drawing exercise: Tape a piece of paper to a

table, then hold your left hand (if you are right-handed, else the right hand if you are left-handed) slightly cupped with palm up, and without ever looking at the paper draw every detail you see in your palm (Edwards, pp. 89-92). Students are amazed to find that the longer they stare at their palm the more lines and details they see. The exercise serves the purpose of introducing the concept of close observation as the basis for creative insight. I build on it with in-class examples and relate it to the idea that our creative interests can guide our perception to see details others miss. Other related exercises help students appreciate that there are many implicit, hidden constraints that restrict our perceptual powers and thus hinder our creativity.

The other type of activity is engaging in creative development. While the overall process is generally too lengthy and encompassing for a class curriculum, it is possible to have students engage in key parts of the overall process. In my course at Yale as well as in presentations for organizations I have participants work on developing a statement of a creative interest. Everyone has incipient interests, but typically they either have not fully recognized the nature of their interest, or have never actually stated it out loud or written about it. In writing out creative interests I encourage (indeed push) students to make their statement rich, à la Alexander Calder's statement of his creative interest quoted above. This process not only helps students appreciate the nature of creative interests, often in the course of working on their statement of interest they make connections in their own personal history, seeing how different experiences that have sparked their interest and stayed with them are in fact connected in the web of a richer creative interest.

A second, related activity is to facilitate exploration of creative interests. There are so many resources available for this in today's world of the internet, in addition to libraries, experts, television and radio, and places to visit. Students can be given time and asked to write briefs describing their activities, in the form or diaries or weekly reports. Over time they will see how the threads of exploration change, some growing, some dying out, with new interconnections forming, and their interest evolving.

Finally, students can engage in creative projects. While projects are generally the central focus of creativity in the ordinary school curriculum, in the program of study I envision they fit as one building block in exploration and exposition of the far broader process of creative development. However they remain important, exciting opportunities for students to exercise their creativity.

The main issue with creative projects is how much structure to impose on them. In true creative development there is often not a lot of structure, though in an organizational setting there may be a considerable degree. In the classroom setting some structure is needed to keep projects manageable.

An example of a creative project I have used in my Yale class for a number of years is the photography/sketch project. I structure the students' general area of work and timeline. In particular, in the first week I ask students to develop a theme or focus that they will explore during the ensuing week, either through photography or sketching. Most students are comfortable with photography as nearly everyone has ready access to a digital camera. A few choose sketching, having had experience with it in the past and wanting to rekindle this activity. I provide some background readings about how to find and recognize a good "shot". The thematic focus acts like a creative interest to provide a way for students to have some focus in their exploration. Over the ensuing week students take photos or make sketches. The next week each student (only some for a large class – but it is better if everyone can present) presents their work and describes the process they went through. Students very much benefit from hearing their classmates describe their creative process, as they begin to recognize that everyone has a different process and has chosen a different theme. Finally, I discuss the topic of revisioning in creative projects, using Picasso's very extensive work on *Les Demoiselles d'Avignon* as an example (see Ministère de la Culture et de la Communication, 1988 for extensive archival materials depicting Picasso's work). Then I ask students, working with a partner, to develop ideas for how to revise their projects. Thus over the course of a full week students are taken through the full cycle of a creative project. Students are often inspired to go even further in ensuing weeks with their project, gaining an

even richer sense of how a project can grow and evolve.

Collaborative creative projects are also invaluable. Structured group brainstorming helps students appreciate that everyone can generate ideas and that building on the ideas of others is integral to the creative process. Placing students in pairs and asking them to generate creativity in the zone of intersection of their creative interests is another exercise that I have found to be very successful. This exercise helps students appreciate how collaborative creativity emerges out of a conversation in which two people find a zone of communication in which both share, have fun, and interweave ideas. One pairs exercise I use is rooted in cultural heritage. Each student brings to class an object that represents their heritage, and then in pairs they share with each other and are tasked to develop a business idea that blends or incorporates both heritages.

For every activity students engage in it is important to have a process for reflection upon the activity and what they have learned. This includes discussion, as well as individual written assignments. It is so common to view creativity as a somewhat unconscious, unguided activity, and it is very valuable to help students understand that individuals guide themselves, constantly making decisions and revising their objectives as they travel the long winding path of creative development.

A capstone project can be an excellent way to complete a program of study in creative development. If the capstone is tied to another subject that the student is focusing on it is a way to tie the two courses together – both will be enriched. A capstone project can either occur in the second term of a year-long program of study or in the year following a program of study as more of a stand-alone course that draws on the previous learning.

For a capstone there are choices to be made regarding how much structure to impose. Creative development is an inherently organic process and in actuality how much time will be spent for example exploring a creative interest or set of interests before a creative project is defined is variable. But for a capstone project in the school setting it is important that the student come to define a project soon enough to leave time to engage in the project itself. My experience has actually been the opposite, students often anxiously rush to define a creative project quickly. The result is that they short change the process of exploring creative interests. An advisor should ideally meet regularly with the student and help them continue to explore, with the awareness that a project will be defined by a certain date. The capstone should have a deliverable at the end, and should include a formal process for reflecting upon the experience.

While students are exploring their own creative development they can simultaneously mentor other students. Listening to someone else describe their creative development, their interests, ideas, projects, challenges, successes and failures, provides additional perspective on the creative process, which naturally feeds back to help one in one's own creative development. Mentoring builds respect for the fact that every person travels a unique path of creative development. As mentors students gain a feeling of accomplishment in helping others, which in turn provides training in the management of creativity.

CONCLUSION

Creativity is rooted in the process of creative development. Every human being can engage in creative development, both contributing creatively to society and experiencing the challenges and fulfillments of creative activity. To unleash the creative development of everyone we must integrate the teaching of creative development into our education curriculum and support creative development as an activity for everyone not just a few.

Creative development can be a coherent program of study. For too long creativity has been viewed as an isolated experience that is injected somewhat arbitrarily into preexisting subjects. In contrast I have outlined here a framework of creative development and the basics for a program of study through which students can learn about creative development and experience it.

REFERENCES

Au, Wayne. 2011. "Teaching under the new Taylorism: high-stakes testing and the standardization of the 21st century curriculum." *Journal of*