Developing Creativity Through Critical Inquiry

by Sharon Bailin — 2015

This commentary argues that creativity is best viewed in terms of significant achievement and that such achievement is best developed through promoting critical inquiry.

INTRODUCTION

Notwithstanding the current emphasis on utilitarian concerns and issues of the bottom line, I would maintain that creativity is still a topic of great interest in contemporary society. The fact that we are participating in a symposium and contributing to a book entitled *Creativity, Imagination, and Innovation in Education* attests to this concern. In this context, Barzun has noted that in a reference book of contemporary quotations, "there are fifteen entries for Creativity and only three for Conversation, two for Wisdom, one for Contemplation, and none for Serenity or Repose." I would agree with Barzun's contention that "Creativity has become what divine grace and salvation were to former times. It is incessantly invoked, praised, urged, demanded, hoped for, declared achieved, or found lacking" (Barzun, 1990, p. 22). One may wonder why this is the case. And I think that here Barzun's analogy to divine grace and salvation is telling. We believe that creativity will save us.

We are facing new challenges in virtually every area of human endeavor. As the world shrinks due to increasing globalization, including global communication media such as television and the Internet, new problems arise as to how nations can interrelate both economically and politically. The economic map of the world is constantly being reshaped, and how to deal with these changes in a productive and equitable manner is a major challenge for all nations, both individually and collectively. Political upheavals, as well as longstanding intractable disputes, exact a toll in human suffering that cries out for remediation. Social issues of poverty, crime, and violence present problems that demand creative solutions on both the national and international levels.

The challenges to science are many as well. Scientists are on the verge of extraordinary discoveries in physics, biology, and cosmology, but are still faced with problems of disease, pollution, overpopulation, and climate change. Moreover, some of the discoveries that science has been making have profound implications for our knowledge of nature, presenting us with unprecedented possibilities for controlling nature but

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also with a whole new set of scientific problems. Recent scientific discoveries have also given rise to profound ethical problems. We will, for example, need to make some crucial ethical decisions about the acceptability and regulation of techniques such as gene harvesting, genetic engineering, and cloning. Moreover, the existence of such techniques may require us to rethink some basic assumptions about parenthood, nature, and what it means to be human.

The problems and challenges are diverse and pressing. What do we believe is required in order to address them? Creativity.

But there is another reason, as well, why creativity is deemed important. The human being is usually defined as “homo faber,” man as toolmaker, or “homo sapiens,” man as knower. But it has been suggested by Dissanayake that we might define the human being as “homo aestheticus,” man as creator (Dissanayake, 1995, p. xiii). One of the defining characteristics of human beings is that we create. We construct culture and cultural artifacts. We are curious and have a drive to understand. We have a need to make sense of the world and our experience, and we shape our understanding into culturally significant forms. And some of these forms are characterized by an attention to form and an attempt to “make special” (Dissanayake, 1995, p. 42). A similar idea underpins Dewey’s positing of four basic human impulses—the impulse to communicate, to construct, to inquire, and to express in finer form (Dewey, 1899, 1976). What is more, the viewing of and participation in these forms gives us new insights into the human condition and human possibility. Thus, creating seems to be a basic aspect of being human, and participating in creative activities can afford deep satisfaction and fulfillment, and can be an occasion for rejoicing, according to Dewey (Jackson, 2001).

For all these reasons creativity is seen as important in contemporary society, and for these same reasons creativity is viewed as an important goal in education. If we want individuals in society who can deal innovatively with problems and challenges, and if we want individuals whose human capacities are fully developed and who are able to derive satisfaction and fulfillment from their exercise, then it is believed that we must attempt to develop creativity.

CREATIVITY: WHAT IT IS NOT

In order to achieve this goal, we need to understand what creativity is. The belief is that if we can find out more about its nature; if we can just pin it down, identify it, measure it, etc., we might be able to figure out how to instill it in people in general and in our students in particular. This view assumes,

of course, that there is some *thing* that constitutes creativity. It may be a certain way of thinking, it may be a cognitive process or a personality trait. But whatever it turns out to be, it is the *thing* that lies behind all instances of creative achievement in whatever area. And if we develop it in people, they will be able to deal effectively and creatively with the kinds of challenges outlined above.

It may seem quite heretical, in this context, to make the argument that I am about to make, namely that there is no such thing as creativity (at least not in the sense just described). I believe that the goal of developing creativity is a worthy one (although its development does not minimize the importance of other paths to salvation such as moral and social values). Yet the conceptual confusion inherent in how the term is often understood renders the means to achieve it problematic.

This is a case where we are misled by language. There exists a noun, “creativity,” and we take it for granted that there must be some entity that corresponds to the term, something tangible, whose function can be investigated, and that can then be developed in those who have it and fostered in those who do not. This assumes that all the instances of creative achievement are produced by something within the creators, and that it is this “something” that all these creators have in common.

This is an assumption that I would deny. Reasoning and evidence point to the conclusion there is no such entity, that creativity is not something that exists in people’s heads (or elsewhere in their anatomy). The only plausible and consistent way to view creativity is in terms of significant innovation, what I have referred to elsewhere as achieving extraordinary ends (Bailin, 1994). Creativity is not some entity or capacity that will enable people to meet the challenges and solve the problems of the world. It just is the solving of the problems in an innovative and effective manner.

In order to make this case, we need to examine the use and logic of the term *creativity*. When we ascribe creativity, to what do our ascriptions actually refer? What aspect or aspects of the person, the process, or the product are we indicating? The answer, according to the view of creativity described above, is that we are pointing to a characteristic (or characteristics) of persons. These may be cognitive processes (they think in a certain way, e.g., divergently, intuitively, out of the box, break set, etc.); or they may be personality traits (e.g., spontaneity, non-conformity, risk-taking, tolerance of ambiguity, etc.). These characteristics make these individuals creative regardless of the specific area in which they are working, and, indeed, even if they never actually create anything. Being creative, then, is

related not to what one has achieved but to the way one thinks or the kind of person one is.

It is clear, however, if we examine actual usage, that we do not ascribe creativity in virtue of the characteristics of persons. We ascribe it, rather, in virtue of their achievements. When we call Shakespeare, Einstein, or Picasso creative, we are not and cannot be referring to aspects of their personality or how they think. We may not know, and indeed do not need to know anything about their cognitive processes or personal attributes in order to judge them creative. We just need to know *Hamlet* or the theory of relativity or the *Guernica*. We call Shakespeare creative because he has produced a body of writing, both plays and poetry, that portrays human character and interactions with such depth and insight and in a language so nuanced, complex, and elegant that his work still touches audiences around the world 400 years later. We consider Einstein creative because he produced scientific theories that profoundly changed the field of physics and our understanding of the natural world. Picasso's claim to creativity lies in developing new styles of painting that embodied innovative ways of seeing the world and altered the direction of art thereafter. We consider these individuals creative because of what they have produced. Our primary ascription of creativity is in virtue of achievement.

Therefore, any claim about the connection between creativity and certain personal attributes must be an empirical one, a claim that those individuals who actually produce significant products do, in fact, think in distinctive ways or possess certain traits or characteristics, and that these ways of thinking or traits and characteristics are causally related to creative achievement.

This claim is problematic for a number of reasons, however. First, there is not universal agreement about precisely which set of processes or traits constitute creativity, and the evidence for a correlation between any particular set of cognitive processes or personality traits and actual creative achievements is very weak and equivocal.

Second, there are problems with the assumption that creativity is characterized by a specific process or way of thinking, usually characterized as divergent, non-logical, intuitive, and generative. On the contrary, the thinking involved in achieving creative outcomes seems, rather, to be convergent as well as divergent, logical as well as intuitive, and evaluative as well as generative (Bailin, 1991, 1994; Perkins, 1981; Weisberg, 1986). Indeed, I would argue that these alleged "processes" are not really separable but rather inextricably connected in acts of good thinking (Bailin, 1987, 1993). Creativity involves creating products that are not simply novel, but are of value in

terms of meeting a need or solving a problem, products that have significance in terms of the context of the domain. Logic, evaluation, and judgment must be involved in such creative production.

Third, it is clear, when examining specific cases, that there are notable exceptions to any generalizations about the personality or cognitive traits of creative individuals. Copernicus, for example, was an extremely timid individual who bowed to authority, and Darwin describes himself as a patient, dogged collector of details. Neither one exhibits the stereotypical characteristics of the creative individual, and yet the fact that each was creative is undeniable. Thus, the claim that there is a particular set of traits necessary to creative achievement is highly problematic (Bailin, 1994).

This is not surprising given that generalizations about creative personality or creative thinking assume that all creative tasks are of a similar nature, and thus there will be one type of person who will be creative. But it seems rather to be the case that the nature of creative activities varies with the specific domain, with the state of the domain at a specific time, with the specific type of task within the domain, and with the specific context in which the creator is working. Thus, it seems likely that the type of person who will be a successful creator will vary as well. It may be the case, for example, that a somewhat different combination of skills, talents, values, and personal qualities will be involved in working in theoretical physics versus in theater directing. Nor is there any reason to believe that the same qualities would be required of a creative artist in Renaissance Europe, where the creative challenge was to increase representational accuracy, and a visual artist working in the contemporary art scene, with its downplaying of skill and its emphasis on conceptual elements and on novelty for its own sake.

I would argue, then, that creativity is domain and context specific, and that it is best viewed not in terms of the attributes of individuals considered in isolation, but rather in terms of the production of creative products arising from an interaction between (1) the attributes of individuals who are thinking critically within the domain, and (2) the constraints of the domain and context within which they work (Bailin, 1994, 1998; Csikszentmihalyi, 1988; Gardner, 1988).

Perkins has offered an analogy to athletic performance that I think is instructive here and upon which I have elaborated (Perkins, 1981, pp. 246–247). Just as we call some people creative, we deem some individuals athletic. We also recognize that people can be athletic in a diversity of ways: They run fast, they are accurate in landing baskets, they ski a beautiful slalom, they have perfected a triple toe loop, and so

on. But we do not believe they all have something in common, something we might call athleticity, which enables them to perform these feats, except some very general things like being fit or having physical dexterity. But even here, the dexterity would be of very different kinds, e.g., leg strength or hand–eye coordination. Moreover, hitting a tennis ball may require a different kind of hand–eye coordination than shooting a hockey puck. There is, fortunately, no such word as "athleticity" to mislead us into thinking that there must be a common thing that we could identify, understand, and measure. Rather, we understand that what these athletic individuals have are very specific abilities that interact with the demands and constraints of the sport in order to produce outstanding athletic performances. We also understand that the way to foster such performance is not to try to develop some type of generic athleticity, which would then manifest itself in diverse kinds of athletic performance. The way to foster such performances is, rather, to work at getting people to run faster, throw balls into baskets more accurately, run a perfect slalom, perfect their triple toe loop, and so on. I would argue that the situation is very much the same with respect to creativity.

CREATIVITY: WHAT IT IS

That there is no such thing as creativity, as traditionally understood, may seem like a ground for despairing of the possibility of achieving the goals which we seek in its name. Such despair is premature, however. There is considerable agreement about what creative achievements look like and about what we are hoping for in the name of creativity, and such agreement provides a place to start. What the kinds of achievements that we deem creative have in common is that they exhibit significant novelty. The two aspects, novelty and significance, are widely seen as the primary characteristics of creative achievement.

Creative achievement by definition involves novelty. It consists in the generation of something that is new or different in some respect from what preceded it, something that differs from those things out of which it developed or which are of a similar kind. It is the aspect of novelty that has tended to be emphasized in theories about and efforts to foster creativity, at least in the West (Bailin, 2005a, 2005b). Such an emphasis is very evident in the arts, where originality is considered a primary value and individual self-expression is highly prized. And even in the field of science, a domain traditionally valuing tradition, there has been a contemporary focus on innovation and radical change in theorizing about the nature of scientific discovery. Kuhn's (1962) notions of scientific revolutions and incommensurable paradigms are a primary example.

Such views are underpinned not by the idea of novelty as simply variation or difference, but rather by the concept of radical novelty. It is assumed that creative works are not simply continuations of the relevant tradition, but that they exhibit a radical break from and are discontinuous with these traditions. Hausman makes the point thus:

It [a created object] appears to be unaccounted for by its antecedents and available knowledge, and it is thus disconnected with its past. In this sense, it occurs in the midst of discontinuity. (Hausman, 1984, p. 9)

One implication of this creative novelty view is that traditions are constraining to innovation, locking one into the prevailing ways of seeing and operating. What is required, then, for creative achievement are radically new ways of thinking that break the bounds and discard the constraints of previous traditions. Thus, there has been an emphasis on divergent thinking and the unconstrained generation of new ideas in theories about fostering creativity. Techniques such as brainstorming have been popular as ways to promote creativity. The skills and knowledge of particular disciplines have often been seen as inhibiting to “creative” thinking, and their importance has frequently been downplayed (Bailin, 2007), as has the role of initiation into the traditions of knowledge and understanding in which they are embedded.

The idea that creative achievement exhibits radical novelty is highly problematic, however. Completely disjunctive novelty is not a possibility (Shils, 1971, p. 144). There is always continuity between creative products and their antecedents. Something new will be like its predecessors in some ways, will be part of an existing category or framework, will be connected with a tradition or discipline, but will depart from the framework in other ways. The degree to which particular innovations depart from existing frameworks varies (Shils, 1971, p. 145). Some creations may be new in some small way but remain, in most ways, much like other members of the same category, while others may differ quite radically (Bailin, 1994). We could not, however, even recognize difference and novelty if they really were completely unconnected with anything that came before. It is the connections to what is familiar that renders innovations comprehensible; making judgments of originality rests on some recognition of similarity as well as difference. Innovative elements seem so striking because we tend to focus on the differences and not notice the continuities.

What theories of radical novelty fail to recognize is the role of the other key aspect of creative achievement—significance. Novelty by itself is not sufficient. A creative innovation also has to be significant or valuable in some respect. Something that is merely new but is not of value will be either trivial or bizarre.

Simply generating novelty is not that difficult. The challenge is to come up with something that is both new and of value in terms of meeting a need, solving a problem, or making a contribution to the context. In science, previous discoveries and theoretical advances continually give rise to new problems, and it is in the context of these problems that scientific innovations have their significance. But even in the arts, gratuitous novelty is not what we are after. Rather, creative art works arise in response to the problems of technique and of expression of the relevant tradition, and will be significant in terms of solving a technical problem, exploring a virgin area, creating a certain effect, providing a fresh insight, or extending the form. Creative works open up new possibilities and new directions in which the tradition can develop.

At the heart of notions about radical novelty and discontinuity is a misunderstanding of the nature of traditions and the connection between tradition and innovation. Shils (1971) characterizes tradition as anything transmitted or handed down from the past to the present and makes the point that human society cannot function in the absence of tradition. Traditions embody the core beliefs and practices of a society, but such beliefs and practices are always somewhat (though never entirely) open to modification and evolution. Originality, according to Shils, works within the framework of traditionality:

It adds and modifies, while accepting much. In any case, even though it rejects or disregards much of what it confronts in the particular sphere of its own creation, it accepts very much of what is inherited in the context of the creation. It takes its point of departure from the ‘given’ and goes forward from there, correcting, improving and transforming. The results of original creation or discovery stand in the stream of tradition. They become a point of redirection of the line of tradition, retaining some elements of the tradition, diminishing the prominence of others and introducing novelty as well. (1971, p. 144)

An innovation arises in the context of an enterprise that has a history and is part of a tradition, and some elements of the tradition continue even in quite radical innovations.

One reason for the rejection of the role of tradition in creative achievement may be a confusion between tradition and traditionalism. Traditionalism refers to an uncritical and unwavering commitment to the beliefs and practices of a particular tradition at a particular time. The traditionalist fails to acknowledge the openness that characterizes all traditions and to recognize that traditions evolve in response to tensions, both internal and external.

This is particularly the case with respect to traditions of inquiry,

those disciplines of knowledge and understanding characterized by self-reflexivity and by continual efforts to correct and improve upon current beliefs and practices. MacIntyre (1988) describes these traditions as follows:

A tradition of enquiry is more than a coherent movement of thought. It is such a movement in the course of which those engaging in that movement become aware of it and of its direction and in a self-aware fashion attempt to engage in its debates and to carry its enquiries forward. (p. 326)

Shils (1971) elaborates thus:

The disclosure of deficiencies and gaps in these traditions and efforts to correct or improve upon them sometimes involve far-reaching modifications in the whole pattern of belief. Every system of thought, every creative pattern which exists has such possibilities inherent in it. (p. 146)

There are various ways in which individuals can interact with a tradition, ranging from unquestioning commitment, to attempts to alter it in some manner, to a major rejection of some of its aspects (MacIntyre, 1988). But the last of these also constitutes an important way of relating to tradition (MacIntyre, 1988, p. 326). And

even the rejection of parts of a tradition generally arises from some marginal strands within the tradition itself (Shils, 1971).

Moreover, traditions provide the context for evaluation even for creative works that reject aspects of the tradition. A tradition has a direction, goals, and meaning in light of which an innovation can be understood. It is the overall aims of a discipline, its overarching problems and guiding methodologies, and its general criteria for assessment that are the basis for determining the significance of creative products, even those that depart from the tradition.

Societies differ with respect to the extent to which they enforce allegiance to traditions or encourage change. Indeed, one characteristic that distinguishes societies that are deemed modern and those that are considered traditional is the attitude toward and extent of innovation. Nonetheless, all societies exhibit change to some degree, although the importance of novelty and the rate of change may vary (Bailin, 2005a; Shils, 1971; Weiner, 2000). Traditional societies are those in which the adherence to tradition is primary whereas modern societies, particularly contemporary Western societies, tend to place a great deal of emphasis on novelty.

Both extremes are problematic, however. Ignoring traditions means neglecting the foundation of knowledge, skills, and critical judgment that make creative achievement possible. On the other hand, if the emphasis is exclusively on tradition, there is the danger that nothing will change. Without the capacity for innovation, a society may be unable to respond productively to change and will likely become static and lacking in vitality.

Both extremes are thus to be avoided. The possibility for creative achievement exists in the dynamic tension between innovation and tradition. It arises out of individuals in active conversation with the traditions of the culture in all their richness, detail, and diversity.

FOSTERING CREATIVE ACHIEVEMENT

How, then, ought those of us involved in education go about trying to foster creative achievement? What I do not advocate is the use of specific techniques, such as brainstorming, to try to free people from constraints and get them to think more divergently (the kinds of techniques advocated by de Bono, for example). I think there are problems with the claim that such techniques will make people more creative. First, equating the techniques with the development of creativity ignores the entire context of knowledge and skill that is necessary to creative achievement. Without knowledge, one is in danger of generating nonsense. They also equate creativity with the unconstrained generation of ideas, but we have seen that there are many constraints in operation within creative work. And the difference between creative and uncreative work may not be a lack of fluency in generating ideas, but rather a lack of finely developed critical judgment. It may be that a technique such as brainstorming could be useful in certain specific contexts, for example when people's thinking is excessively rigid, when people are blocked in terms of coming up with ideas, or when people are working together and it is helpful to get lots of ideas on the table. But such techniques are not a panacea in terms of fostering creativity. Fostering creative achievement is a more complex business, aiming at the development of significant novelty in specific areas and contexts.

CRITICAL INQUIRY

If creative achievement requires both novelty and significance, then both tradition and innovation must play a role in attempts to foster it. What is required is a dynamic relationship between the freedom of imagination and the constraints of tradition. Skills and knowledge must be developed, but in a manner that

also encourages questioning and criticism, the development of critical judgment, and the personal appropriation of the tradition by each individual student. We might call such an approach *critical inquiry* (Bailin & Battersby, 2010).

Critical inquiry does involve learning within subjects and disciplines, but not in the traditional way. It is not a matter of memorizing pieces of knowledge to be given back on tests and examinations. Nor does it consist in acquiring rote skills that must be performed exactly as taught and that are acquired in the context of ends established beforehand by the teacher or educational establishment. It involves, rather, a different way of looking at what it means to learn a discipline. We have often treated school subjects as if they involved fixed bodies of information to be memorized. But disciplines of knowledge are not static bodies of information. Rather, they are traditions of inquiry that are open-ended and dynamic. They consist not merely in information but also in live questions and modes of investigating these questions. And even the bodies of fact are not fixed, but are in flux. There are open questions, ongoing debates, and areas of controversy within every discipline, and these furnish the arena for evolution and change (Bailin, 1994). Scheffler makes the following point with respect to the modes and principles of inquiry:

We need not pretend that these principles of ours are immutable or innate. It is enough that they are what we ourselves acknowledge, that they are the best we know, and that we are prepared to improve them should the need and occasion arise. Such improvement is possible, however, only if we succeed in passing on, too, the multiple live traditions in which they are embodied, and in which a sense of their history, spirit, and direction may be discerned. (1967, p. 124)

It is vital, then, that students become critically engaged with these traditions. It is important that they master not only the current body of information, but also the principles and procedures of the discipline, the methods whereby inquiry proceeds, the standards according to which reasons are assessed, and the deep questions that are at issue. Criticism must be understood as part of the subject matter itself, as part of what it means to learn a discipline, as the method whereby inquiry proceeds. And students must participate actively in this process of inquiry and criticism.

Disciplinary skills must be learned in the context of this type of inquiry approach. Skills are not merely habits; they adapt to changing circumstances and involve critical judgments. Thus, skills should be taught as flexible abilities that are applied in a variety of circumstances. Also, the ends to which they are applied need not always be fixed in advance but may change in the course of the inquiry. And the ends may sometimes be

chosen by the students themselves as opposed to being set by others. In addition, skills must be understood within the broad context of the discipline as a whole. It is important to develop the ability to see beyond the specific problem or issue with which one is dealing and to have a real understanding of the methods and procedures of the discipline, and the principles and goals that lie behind them.

Creative achievement is best fostered, then, through an understanding of the critical and creative nature of disciplinary inquiry, and through participating in the dynamics of the discipline in a way that is personally meaningful. The disciplines must be seen as modes of inquiry, exploration, experimentation, and expression.

Although I have emphasized disciplinary inquiry, I do not mean to imply that creativity is limited to traditional disciplines. Significant innovation is possible at the interface of two or more disciplines, in a hybrid field that results from the cross-fertilization between disciplines, or in areas of human endeavor that do not fall neatly into any one of the traditional disciplines. Nonetheless, knowledge and modes of inquiry that arise from our traditional disciplines generally provide the basis for outcomes in these areas. And the examples of significant achievement that we consider prototypical of creativity are generally drawn from the arts, sciences, and humanities—from the traditions of human inquiry and accomplishment.

WAYS TO FOSTER CREATIVE ACHIEVEMENT

CREATING A CONTEXT FOR INQUIRY

If we want to promote critical inquiry, then it is necessary to create a context in which inquiry can take place. One aspect of this is the framing of the curriculum in terms of issues and problems that provide real challenges to students' thinking (Bailin, Case, Coombs, & Daniels, 1999). Such problems and issues should not have predetermined right answers, nor should they involve the straightforward application of an algorithm. Rather, they need to be open-ended and demand critical thinking and imagination on the part of the students. These challenges can be within a discipline or they can be interdisciplinary and might focus on solving a problem, making a decision, resolving an issue or dilemma, carrying out an inquiry, performing a task, or creating an artwork. And although the teacher might set such challenges, they can also be invented or posed by the students as they become engaged in the process of inquiry. Some examples of this type of contextual challenge would include: designing a scientific experiment to test a hypothesis; coming up with a theory to explain a natural phenomenon, for example the extinction of

the dinosaurs; taking and defending a position on a social issue such as television violence; coming up with a fair-minded account of a historical event given conflicting accounts; conducting a trial to determine the culpability of a historical figure; writing a report to evaluate alternative solutions to a business problem; designing a website; doing a painting in the style of a well-known artist; composing a piece of music; and creating a play centered on an issue of interest to the students. All of these challenges provide contexts that engage the students in real inquiry. They allow students to actively participate in communities of practice and get a sense of what practitioners in various areas actually do. Such challenges promote critical thinking, active learning, and imagination.

DEVELOPING KNOWLEDGE AND SKILLS IN THE CONTEXT OF MEANINGFUL CHALLENGES

Such challenges also provide a context within which the acquisition of skills and knowledge is meaningful. When knowledge is viewed as isolated pieces of information to be memorized, learning will not be meaningful to students. The reasons for acquiring the knowledge will likely not be clear, and the whole enterprise of schooling may seem like an arcane game that needs to be learned to achieve good grades but which has no other purpose. But when the disciplines are learned as ways in which others in the past have explored the world and expressed themselves, then the purpose is clear. And the possibility is opened up that the students themselves can do likewise.

Learning in the context of such challenges also makes it possible for students to make connections between various aspects of their learning that all come together in order to solve the problem. A challenge might, for example, be focused on a decision as to whether to support a local environmental group's actions, and the students would take into account scientific, economic, social, and ethical considerations, among others.

This mode of learning also takes education out of the realm of reliance on textbooks. Knowledge becomes much broader than what is contained in textbooks; and library books, Internet sources, newspapers, and community resources all become resources for learning. Textbooks may still play some role, but they can be extended, built upon, and treated much more critically. One could, for example, take a textbook account of a historical event and have students do research to find accounts of the same event from other perspectives. They would then try to come up with an account that is more balanced and incorporates the various points of view.

This type of inquiry approach also provides for the possibility of skills being learned in a much less rigid fashion. Skills can be learned in the context of real purposes to be achieved. Thus, their acquisition can be meaningful to students. And if the students care about the goals, then the motivation to acquire the skills will be much more powerful. In addition, a central goal in skill acquisition will be the development of judgment as the skills are developed and deployed in a variety of contexts and circumstances. In learning a certain technique in painting, for example, students would not only learn to master the technique, but also learn how it has been used in various works to achieve certain effects. They would also explore how they might use the technique, and even modify it, in their own work to enhance their own creative expression.

FAMILIARIZING STUDENTS WITH THE CRITERIA FOR CREATIVE WORK

Since creative achievement involves not just novelty, but significance or quality as well, it is centrally important that students understand what is involved in quality production. Critical inquiry implies critical judgment, and thus requires knowledge of the relevant criteria for evaluation. Thus, it is crucial to familiarize students with the criteria for quality work in particular areas. Although there are some common criteria and some overlap between areas, criteria for quality products vary considerably from area to area. For example, the criteria for evaluating a mystery novel would include coherence of plot, degree of suspense, and believability of the characters. Criteria for evaluating scientific claims would include the ability to provide a better explanation of the evidence than competing theories. In addition, if the instructor is looking specifically for creativity or originality in student work, then it is vital that he or she specify clearly the criteria for identifying such creativity or originality. This should not just be a subjective judgment.

INTRODUCING THE HISTORY OF INQUIRY IN THE PARTICULAR AREA

Creative achievements take place within the context of traditions of inquiry that have a history. Knowing the history of, and context surrounding, the issues and challenges that are the objects of our inquiries is important for understanding and engaging with these traditions in a meaningful way (Bailin & Battersby, 2010). Moreover, having an understanding of the debates, controversies, and questions that have fueled past inquiries can give students a sense of why and how the discipline has changed and how creative achievements take place.

It is also important to represent this history not as an

impersonal story of theoretical advances and developments, but rather as a story of human activity and human creative achievement, of toil, frustration, triumph, and the joy of discovery and creation. This approach can allow students to relate to these activities and achievements in a personal way. It also provides them with exemplars demonstrating the human drive to create and the joy and fulfillment afforded by the participation in creative activities.

ENCOURAGING WORK THAT INVOLVES STUDENTS IN CONSTRUCTING AND CREATING

An inquiry approach entails active involvement on the part of the students. They should not be merely reproducers of existing knowledge or passive responders to preformed questions. Rather, they should take an active role in asking questions, constructing knowledge, and creating cultural artifacts. And students' own questions and concerns, in addition to those posed by the teacher, can be a basis for student inquiry and creation. Let me illustrate the possibilities for student participation in constructing and creating with some examples drawn from a range of subject areas and contexts.

Designing an Insect Habitat

Although science is an area that may seem to afford little possibility for creativity, the history of scientific discovery is actually rife with creative achievements, and there are many possibilities for involving students in the generative aspect of science. One example, aimed at primary students, involves having them design a habitat for an insect of their choice (McDiarmid, Manzo, & Muselle, 2007). Students use the information that they have gathered about the characteristics and habits of various insects to perform an engaging and real task, i.e., actually designing a habitat. In addition to research and observation, activities might include the development of criteria, designing, and evaluation.

Designing an Experiment to Test a Hypothesis

This challenge, geared to intermediate students, involves having them design an experiment to test a causal hypothesis that they have generated after making an observation (Bailin, 2002). Preparatory activities might include performing and discussing experiments in order to understand what constitutes a good experiment, and looking at historical cases in which hypotheses were justified or refuted by crucial experiments or where experiments did not constitute good tests. This kind of challenge engages students not only in the acquisition of

scientific knowledge, but also in scientific thinking, in the constructive aspects of science, and in an appreciation of the role of aesthetic criteria such as simplicity, elegance, and imaginativeness in scientific work.

Choral Dramatization of a Poem

This challenge, in the areas of literature and drama, consists in the creation of a choral dramatization of a poem. This involves having the students prepare a presentation of a poem, which would include an oral reading using a variety of vocal combinations and effects, and an expression of the passage through movement using techniques such as slow motion and tableaux. This task requires students to actively interpret the poem, to solve various problems of dramatic expression, and to make aesthetic judgments in order to create a dramatic product.

Musical Composition with Found Instruments

Music composition provides an obvious context for the active participation of students in creative work. One way to engage students who do not have a high level of expertise with traditional instruments and musical notation in the creative enterprise of composition involves the use of “found” instruments, that is, everyday objects such as vacuum cleaner hoses, saws, and trashcans from which one can elicit interesting sounds. In composing with these “instruments,” students learn about traditional musical concepts such as dynamics and rhythm, but also learn something about what is involved in creating a piece of music that is expressive and satisfying for them.

Interdisciplinary

Interdisciplinary contexts also provide a rich source for engaging students in critical inquiry. One example of an interdisciplinary challenge would be for students to try to decide whether to support a controversial plan for a new development. Dealing with this challenge could involve research, interviewing, assessing reasons and arguments, and weighing different kinds of considerations, such as economic versus social or ethical, or alternative proposals or points of view. At the end, the students might write a letter to the newspaper, make a documentary video, or participate in a public meeting to make known their view. Thus, students are dealing with traditional disciplinary knowledge in mathematics, science, economics, and social studies, but are learning it and using it in the context of a real-life issue, constructing their own

views and ways of representing them, making real decisions, and becoming active participants in their community.

Each of the preceding is an example of students engaged in critical inquiry. The activities provide contexts for inquiry in the form of meaningful challenges that involve students in constructing and creating. Skills, background knowledge, and knowledge of the relevant criteria are acquired in the context of an engagement with the various traditions of inquiry.

Fostering a Community of Inquiry and Practice

It is important that students also have the opportunity to propose areas and issues for investigation. As they become engaged in inquiry, they will likely begin to have their own questions or issues that they want to pursue, and begin to decide on some of their own goals. This is a crucial part of becoming active and autonomous inquirers and creators, not just in the classroom setting, but also in their own lives outside of school.

One of the common ideas people tend to have about creativity is that it involves a solitary creator, working alone, to come up with a creative product. Yet a large percentage of creative works have been the products of people working together. And this is even more the case today, with scientists working in research groups, businesspeople working in teams, and artists experimenting with collaborative ways of working. Most of the challenges previously outlined provide ample opportunities for collaborative work and collaborative creation, and for students to become part of a community of inquiry and practice.

Fostering a Spirit of Inquiry

An important element in terms of fostering creative achievement relates to habits of mind. I have argued above that creativity cannot be identified with certain personality or cognitive traits and that there are no traits that are causally related to creative achievement. I have argued, further, that the most promising way to foster creative achievement is through encouraging critical inquiry. Critical inquiry does, however, involve certain habits of mind—what we have referred to elsewhere as the spirit of inquiry (Bailin & Battersby, 2010). Critical inquiry demands an inquiring attitude. Curiosity and exploration must be encouraged and rewarded. If students know that the teacher really does expect one right answer and they will not be rewarded unless they produce it, then it is unlikely that they will become real inquirers. Rather, there must be respect for students' ideas, the encouragement of risk-

taking, and some degree of tolerance for mistakes and failure. But this tolerance must be accompanied by the fostering of appreciation for human creative achievements, the desire to attain standards, and the willingness to critique and to receive criticism. It is important for students to develop a willingness to question and a spirit of open-mindedness with respect to what they might discover, as well as the ability to work productively with others and a spirit of open-mindedness and fair-mindedness with respect to what others propose. The ability to work with others must, however, be combined with the development of autonomy—the willingness and ability to be independent in one's judgments and actions, to have the courage to uphold one's convictions and not rely on authority for deciding what to believe or how to act.

Finally, perhaps the habit of mind that is most conducive to creativity is what McKellar has called "discriminating receptivity," i.e., a serious receptivity toward what has gone before, but an unwillingness to accept it as final (McKellar, 1957, p. 116). The path to creative achievement lies in the willingness, the knowledge, and the imagination to criticize, to challenge, and to go beyond.

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