Creativity, Education and the Subversion of the State

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Abstract

Creativity is seen as valuable and rightly so, but the difficulty is that in recent times it has come to be defined narrowly as practically synonymous with what is economically valuable. While government initiative to encourage creativity within educational systems is welcomed, the view that creativity will result if sufficient resources are allocated needs to be treated with caution. One aim of education is the development of human beings in all their capacities and talents, and this is creativity in its most fundamental sense. Applied more generally, this provides the background for a more general analysis of the concept of creativity. Since creativity involves not only what is innovative and new but also valuable, it is by no means clear how increased efforts to foster creativity will bring it about. The received view is that the logic of discovery and the logic of justification are not the same from which it can be concluded that there is no correlation between the resources allocated to a search for innovation and novelty and the outcomes of such a search.

In this paper we provide an analysis of the concept of creativity and show that just because something is innovative and novel does not mean that it will be valuable as this is something to be determined within the context of field of activity in which what is creative is produced. This is in contrast to the rhetoric of governments, where what is valuable inevitably means what is of economic value. Concentration on economic value as a measure of whether something is creative is corrupting of the norms and standards applied by a discipline to determine whether something is creative. A narrow concentration on what is of economic value is the result of a lopsided understanding of what is good for human beings and that this is to the detriment of other more reflective forms of creativity which seek to locate the human good more broadly. Insofar as this runs against what is seen as valuable by the State, an education which encourages the development of all the capacities of human beings will be subversive, as will be resisting the intrusion of economic values into the assessment of creativity or deciding what projects or problems to pursue.

Introduction

Education is a concern of governments everywhere and it comes as no surprise that they should want to provide the best, most cost effective education at all levels that they can. Inevitably, blueprints are published to address complaints that school students have falling standards of literacy and numeracy, lack appropriate skills, are poorly prepared for employment or further education and that their teachers themselves are not as well prepared as they might be. At all levels of education, this has generally meant an increasingly centralised control of curriculum and teaching practice. As a consequence, the imposition of a depressing uniformity on what can be taught and how it can be taught leads to a stifling of creativity in the teacher and hence, in the student. Various studies have shown that teachers prefer students who have high IQ, rather than those who exhibit high creativity. This, it is suggested, is because students with high IQs will perform well in the kinds of learning that is favoured by a sequentially ordered curriculum, whereas those with high creativity are less likely to be attracted to conservative and convergent learning processes and will be more attracted to unconventional styles of learning (Moore, 1966). In an orderly classroom, this can prove to be very challenging for an already harassed and harried teacher trying to ensure that she finishes all the requirements of a government imposed syllabus. Predictably, from bureaucrats we have a desire for order, but obsession with a certain kind of order destroys creativity, for it tries to channel energies into well trodden paths and recognised ways of doing things. If order and orderliness become an end in themselves, creativity is stifled. Efficiency which relies on following a well-established, ordered approach is the enemy of

creativity because the essence of creativity, as we shall argue, is that it introduces novelty and subverts existing ways of thinking. Creativity at the political level can be extremely dangerous, since it has the potential to overturn the existing political order.[1] This will not be in the interests of those, such as banks and large corporations who rely on maintaining a hegemonic grip on political and economic theory to ensure acceptance of market capitalism and to safeguard their profits.

These initial remarks already assume that creativity has certain kinds of characteristics and that it is the enemy of conservatism, efficiency and order. This is an oversimplification since most governments and education departments are eager to encourage creativity, at least in certain kinds of directions.[2] Creativity, however, is not easily characterised and will be understood differently in different disciplines and areas of human endeavour. There has been a great deal written about creativity, according to Tepper (2004) who notes that in the Harvard Business School catalogue more articles and books have been written on creativity than on any other business area. This, of course, suggests that both business and government realise that it is through human beings – and their creativity – that change is able to take place and economic growth sustained through new innovations. Of course, it is also obvious that encouragement to be creative will occur in those areas which are seen as most economically valuable. That the preponderance of government funding for research goes to science and technology, rather on the arts and the humanities is a clear sign of a preference for a certain kind of creativity. Creativity, however, is not as easily harnessed to the requirements of the State as might be supposed.

In what follows, we will begin with an analysis of the concept of creativity and argue that there are three components to the concept of creativity, the description of someone as a creative person, a description of the creative process and of something as a creative product. Creativity the noun describes a process and a capacity which has its origins in theology (Bröckling, 2006). God is Creativity Itself, since it is God who brings the world into being *ex nihilo*. This provides us with the most radical understanding of creativity since it is the bringing into being that which did not exist before. It is radical because in the case of God's creativity, what is created never exists in potential, there is no becoming: what God wills, is. God is pure act and grounds the being of all things. Human beings have the capacity to manipulate ideas, the forms of existing materials and to present these in new forms, but they cannot bring things into being *ex nihilo*.[3] Human beings create only in a limited way because they can bring into being only what previously has existed in potential. Human creativity is limited because human abilities are finite. Nevertheless, when we think about human creativity we think of the capacity to bring into being something new, something which did not exist before.

The radicality of the nature of creativity also explains why it is subversive. Though human beings can only bring into being what already exists in potential, just as God's creation erupts into being and the world is completely altered, so too, new and innovative human ideas can also erupt into the human world, altering it beyond recognition. There are numerous examples of how ideas have changed the way human beings think and act. The idea, for example, that the earth was not the centre of the Universe, inaugurated a profound revolution in how human beings saw themselves. Darwin's *The Origin of the Species*, which proposed the idea of evolution, reminded human beings that they too are animals and introduced the idea that they may be more closely connected to the primates than they might have cared to have acknowledged. These and similar ideas are subversive because they overturn existing conventions, disrupt the complacent orderliness of traditional processes of thought and force human beings to readjust their understanding of the world and, importantly, of themselves.

Education and Creativity

Progressive educators, such as Ivan Illich[4], have been highly critical of the capacity of educational institutions to foster creativity, arguing that, on the contrary, they seem to have the opposite effect. Such observations are supported by more recent writers (Md' Yunus, 2007; Worthington and Carruthers, 2003).

Children's creativity is stifled not necessarily because of a deliberate program to suppress any curiosity, spontaneity or eccentricity, rather because it is either not recognised (Runco, 2003) or because a packed syllabus does not allow time for students to find things out for themselves and learn to use their ingenuity. Discovery learning, where it is practised, is necessarily artificially contrived to ensure that students are able to retrace what has already been discovered; they are not expected to go through the same process of discovery that may have taken scientists many centuries.[5] Whether progressive educators are right to argue that educational institutions on the whole stifle creativity depends on being able to answer the prior question of what is meant by creativity.

When educators speak of encouraging children to develop their creativity they will have in mind such capacities as: 1) curiosity, 2) spontaneity, 3) insight, 4) perseverance, and 5) flexibility. These are all important attributes, but they are by no means the only capacities that children need to develop if they are to become fully developed, autonomous human beings. Other capacities such as critical thinking and reasoning skills, literacy and numeracy, sound moral values and habits, appreciation and love of beauty and truth, a sense of the sacred, also feature high on the kinds of capacities educators are keen for students to develop. Education is not just a matter of gaining skills and knowledge useful in the workplace, it is also most importantly concerned with the development of the human person. Socrates dictum, "Know thyself", is central to the aims of education. In realising their potentials, children perform one of the most important of creative acts, but in this bringing forth they do not act alone, but in the company of others. When schools and educational institutions are accused of failing to foster creativity, it is not creativity in the narrow sense of a set of capacities that they have failed to foster, rather they have failed to enable the young people in their charge to flourish and reach their full potential.

Teachers in the classroom are also urged to employ their creativity to develop teaching strategies that will enable their students to learn more effectively. Lessons, it is argued, have to be interesting, engage the student and enable learning to take place. The difficulty is that a teacher can be well prepared in terms of her knowledge of the subject matter, have spent an inordinate length of time developing various teaching strategies and aids, but nevertheless her pupils fail to learn anything at all or learn what was not intended.[6] They may not, for other kinds of reasons, fail to learn and do not develop. This cannot be blamed on the teacher. Creativity understood in terms of thorough preparation, innovation in the presentation of a lesson and flexibility in its delivery will not result in successful teaching if the pupils do not learn. There may be many reasons why this might be so, the pupils, may, for instance, have become used to a particular style of teaching and simply do not respond to a new approach. On the other hand, a good teacher may know her subject well, prepare thoroughly, but be predictable and boring in her presentation, yet the pupils learn very well. A teacher who exhibits a love of her subject, cares for her pupils and strives to make her lessons interesting demonstrates good teaching practice. Good teaching practice will be creative if it enables children to develop their talents and to reach their full potential.

Cannatella (2004: 60) says that the lecturer who fails to stimulate students' creativity, their being in the world, a telling phrase, may be unwittingly inhibiting their cognitive, emotional and physical well-being, preventing them from realising their potential. Some learning problems, he says, are due to teachers stifling students' creativity. This occurs, he adds, when students feel emotionally or intellectually repressed. Cannatella in linking students' creativity with their being in the world understands that an important purpose of education is to enable young people to fulfil their potential and so to flourish as autonomous human persons. Significantly, the formation of human persons and the enabling of their flourishing is a creation, for what only existed previously in potential is now realised. Becoming a person is a creative act, one in which not only ourselves, but also many people, particularly our families and our teachers, play a central role. Of course, as Cannatella warns, the process of creating ourselves because it relies on the cooperation and active support of others, can be easily derailed. This occurs when our teachers discourage our curiosity, when our friends are jealous of our talents and actively denigrate our efforts to use them and when our families fail to encourage us when we are frustrated and disheartened. As a result, our being in the world is crippled and

stunted and this is not just a personal tragedy, but one for all the community of human beings because if we are not able to be all that we can be, neither can the community to which we belong.

Creativity as outlined here in the educational context is primarily about the fulfilment of the potential of human lives and the common perception that it consists in enabling children to develop capacities such as curiosity and spontaneity derives from this primary understanding. Curiosity and spontaneity are important abilities, but the focus of education should not be on particular abilities, but on the individual person. This means helping the child discover what talents he or she possesses. In its most important aspect, education is about the realisation of potential and the being in the world of human persons. A theological understanding of this begins with the creation of human life, for in bringing into being a human child, a man and a woman co-operate in the creative action of God. In bringing a new, unique individual into relationship with the family of all human beings – and of all creation – new possibilities enter the world, life is renewed and reaffirmed and the community is enriched. On the other side of the coin, it also presents new challenges, responsibilities and obligations to the community to ensure that each new life in its care is able to fulfil its potential and enable the Kingdom of God to be realised – or as Kant puts it, the Kingdom of ends.

The task of the teacher is therefore enormously important since it is in her hands that, for a crucial period of maturation, a significant portion of the responsibility for the formation of the child is placed. The view that creativity in teaching consists in making use of the latest innovations in technology, of spontaneity in the classroom and a flexible approach to learning, amongst other things, obscures this important role. Just as every human being is, every teacher is called to be involved in the creation of the kingdom of ends, though for a period of time through the education of her pupils, in a more intimate and significant way. How she will carry out this task will depend on her own talents, capacities and personality. These will be different for each teacher and so the creative classroom, understood as a classroom in which the opportunities for the formation of persons are maximised, will likewise be very different for each teacher. There is no general formula to be applied. Helpful though they might be, creativity in the classroom will not depend on understanding and applying the latest educational theories, but rather in a teacher knowing her pupils well and being sensitive to their needs as individuals. The challenges of this should not be underestimated, but neither should these fundamental requirements be hidden behind the gloss of new curricula and new technological innovations.

An analysis of the concept of creativity

We have argued that creativity within the educational setting is to be understood in the broad sense of formation of persons and that this task is challenging. In the wider context, creativity opens up new horizons and new possibilities. In encouraging creativity in the educational context, teachers are occupied with the task of developing the abilities and capacities that each pupil possesses and this will require the teacher to be innovative, flexible, insightful, knowledgeable and empathetic, to name only a few attributes. In seeking to develop her own good teaching, a teacher also engages in her own human fulfilment and hence, in act of creativity, apart from the creativity involved in the formation of her pupils. It is from this general notion of creativity as being the cooperation of persons in the formation and development of others and hence the creation of a community, that we can construct a more detailed analysis of the concept and show its connection to other conceptions. It is to this analysis to which we now turn.

J.P. White (1972: 136-7) in his analysis of the concept of creativity holds that description “creative” cannot be applied at all without being put into some kind of context. That is, he says, it makes no sense to just speak of creativity in a general sense. Someone is a creative musician, or a creative scientist or creative philosopher, but not just creative. Moreover, creativity does not just mean that a person can freely determine how to act. It may mean, says White, that they have to be aware of the rules that operate in particular domains. Thus, they need to know about theories and about processes that constrain the domain in which their creativity is able to be exercised. Creative processes produce what is intellectually or aesthetically valuable. In more recent times, however, creative processes have come to be seen as needing to produce first

and foremost what is economically valuable. Of course, not everything labelled as being creative is seen as being valuable. 'Creative' accounting, for instance, is not a term of praise, but of condemnation. White's analysis distinguishes three components of creativity – the creative process, the creative person and the creative product.[8]

In his account, White fixes his attention on what leads us to call the work of great scientists such as Newton, great artists such as Leonardo Da Vinci and great writers such as Shakespeare creative. He concludes that it is because their work is regarded as valuable, rejecting the view that it is due to some inner psychological process that it is labelled as creative. Additionally, their work is regarded as valuable within a context - Da Vinci's paintings are valued for their aesthetic beauty, Shakespeare's writing because it is literature that expresses universal truths about the human condition and Newton's scientific discoveries because of their profound effect on our understanding of the physical world. Work of a journalist or a writer of detective novels, for example, though not without value, is not regarded as being creative in the same way because it is judged, presumably according to some literary norms, to not be of the same value and so not creative, at least not to the same extent. Obviously, it is also not judged according to the criteria which apply in the scientific arena. White's analysis though it identifies the importance of the creative product and its value as enabling us to describe someone as creative, does not tell us to what extent such human attributes such as imagination, originality and spontaneity are needed for someone to be capable of producing something which is regarded as a creative product. Moreover, it is unclear whether creativity admits of degrees. While it may be true that the rather conventional work of the journalist fails to reach the creative level of a Shakespeare, nevertheless it is not the case that it has no value.

The question of degree also arises when one considers whether what children produce can be considered creative. The difference between what a child might discover mathematically for herself through a discovery method used by her teacher and how a mathematician goes about his work is considerable. Though what the child discovers is valuable in the sense that she has learnt something new, in the case of the creative mathematician, what is discovered is valuable because it adds something of importance to our mathematical knowledge. For the mathematician, to reach the point of making a valuable discovery requires a quite different process to that being used by the child. It requires rigorous training, discipline, mastery of a variety of mathematical techniques and persistence, none of which guarantee that the mathematician will be successful in the task of discovery that he has set himself. Creative in the sense it is being used about the child implies that discovery methods are being used to teach the child and she is able to use her imagination and limited knowledge of mathematics to discover something for herself, but this is not creativity in the primary sense White understands it (White, 1972:138-9). In its primary sense, White understands creativity to involve the making of an original contribution to some field of knowledge.

In a similar vein, the artistic products of a child may exhibit some imagination and some originality, but they are not going to be considered creative in the same way in which a mature work of a professional artist will be. Although White thinks the key question to be asked is whether it is to be regarded as aesthetically valuable, it is not the only criterion. Just as in the mathematical example, a mature artist will have spent many years acquiring various technical skills and in producing an artwork will marshal his skills in order to bring into being what he wishes to communicate. Cannatella (2004:61) says that goal of the artist is to represent what is humanly riveting, such as an embodied encounter or some other kinds of human experiences. This is clearly a level of experience of the world that a child simply will not have, no matter how well they might execute an artwork. White concedes that it is true that some work by children will have a certain aesthetic value, but this does not make it creative, though it may have some originality. White notes two problems i) what is meant by calling a child's work original is not clear and ii) how far originality is to be regarded as a criterion of aesthetic value needs further consideration. White concludes that originality is not a sufficient condition because the judgement of originality itself seems to depend on recognition that what has been produced is aesthetically valuable (White, 1972:140-1).

Although White concentrates on showing that a central criterion in the judgement that something is to be regarded as creative is that it is valuable, his analysis demonstrates that it is not the only criterion. The various examples drawn from different fields show that the creative person is required to exhibit certain kinds of qualities also. It is expected, for example, that the creative person has adequate training in the relevant discipline. Without such training, it is impossible for him or her to make any advance in the discipline. Secondly, it is also evident that the product designated as creative has to be regarded as valuable, but the criteria for making this assessment are far from obvious. If originality is a criterion, independent reasons need to be given for regarding something original as valuable. Just because something is original does not make it valuable. It is possible to do something, such as painting a black and white version of the Mona Lisa in crayon, without it being regarded as valuable just because it is original. Whether such a painting would be regarded as valuable would depend on norms established by the discipline and applied by those with the expertise to do so. Thirdly, the process itself cannot be haphazard or the result of chance. In the case of scientific discovery, though there are examples of discoveries made by chance, scientists typically work within a scientific paradigm in which certain kinds of methods and techniques are used. For example, in order to do certain kinds of particle physics, a particle accelerator is required, without it, particular experiments are impossible.

In summary, creativity as we have outlined it so far has three elements: 1) a creative agent; 2) a creative process, which is understood not as a mechanical heuristic for the production of creative products, but rather as the methods and techniques that a creative agent needs in order to be able to undertake advanced work in a particular discipline or field; it becomes a creative process when the agent brings to bear his or her own talents on the application of the methods and techniques on a particular problem, project or endeavour; 3) a creative product which is the making of something new and, in a sense still to be fully explicated, an original contribution to the agent's field or discipline. An additional consideration, which might rightly be considered to be a fourth element are the value judgements that are made about whether or not the description of creativity applies in each of three elements. That is, we need to provide some criteria for claiming that an agent is creative, that the process is appropriate in the field of application and that the creative product is judged to be valuable according to a set of norms determined by the field or discipline in which the product falls.

The creative agent

Five attributes may be identified which characterise the creative agent. These are: i) intelligence; ii) persistence and the capacity for prolonged hard work; iii) concentration and discipline, where concentration means having curiosity and interest in one's field or subject and discipline means commitment to and caring about the contents and the methods with which one works, including a passion for truth and a love of clarity and precision; iv) extensive experience in a particular field and v) immersion in a tradition.[9] These attributes are echoed by Bruner who says the creative person has:

> (a) detachment and commitment -a willingness to divorce oneself from the obvious, from forms as they exist, but also caring, a deep need to understand something, to master a technique, to reformulate a meaning; (b) passion and decorum-a willingness and ability to let one's impulses express themselves through one's work but also a love of form, observance of etiquette toward the object of one's effort, respect for materials, and readiness to be dominated by the object; (c) immediacy and deferment -an immediate urge to create something, a general idea, a sense of direction, a feeling but also deferment and rejection of premature completion. (Bruner, J.S. 1962)

Bruner's list of attributes illustrate the tension that exists in the creative person. Not only does the agent have to exhibit certain kinds of commitments, but he or she must stand ready to break the mould in search of a solution to the problem that he or she has set himself or herself. Radford (2004:54) remarks that there is a

perversity in human intelligence that seeks out or deliberately makes dissonances so that we are shaken out of our complacency and forced to seek ways of resolving the tensions created. Although creative activity can take place within the bounds of a conceptual space as Radford suggests, the most valued form of creativity is that which breaks out of the conceptual space which constitutes a particular domain of activity, points in new directions and enlarges and deepens the particular discipline or field.

In order for a creative agent to be capable of such high level creativity, he or she has to have sufficient intelligence to be able to master his or her chosen field or discipline. Although research shows a low correlation between intelligence and creativity (Moore, 1966; La Chappelle, 1983), lack of intelligence would preclude the mastery of a discipline that is required in order to have the methods and techniques necessary to work on a chosen problem or project. In any case, the research does not show that intelligence is not required for creativity, only that high IQ, as measured by IQ tests, is not also highly correlated with high creativity, as measured by creativity tests. It should be noted that what is measured by psychological tests is not a measure of creativity, but of responses to questions which seek to establish whether individual subjects possess certain kinds of attributes. For example, creative persons, it is hypothesised, will be divergent, innovative and constructive thinkers. The possession of such attributes does not measure creativity because having certain kinds of attributes does mean that they will be used and. as we have already indicated, creativity involves a value judgement about what is created. Intelligence, understood as a capacity to sufficiently master a discipline, together with the ability to think laterally, is an important characteristic of the creative agent.[10]

The second characteristic of the creative person is their capacity for prolonged hard work and their ability to persist in the face of difficulties and setbacks. There is, in the capacity to persist a certain kind of self confidence and self belief that leaves the person in no doubt that he or she is on the right track and which ensures he or she will not be swayed from his or her vision. There are numerous examples of artists and scientists who have laboured long and hard to achieve their goals. Michaelangelo, for example, refused to be hurried in his painting of the Sistine Chapel, Antoni Gaudi (1852-1926), the Catalan architect, worked on his greatest work, the Cathedral in Barcelona *La Sagrada Famiglia*, until his death, knowing that it would not be finished in his lifetime. Work on his masterpiece continues, following the detailed instructions which he left. Vindication of Einstein's claim in the Theory of Relativity that the speed of light was constant relative to moving frames of reference was not definitively established until nearly 25 years after his publication of the Special Theory of Relativity.

The ability to concentrate for considerable periods of time and to maintain enthusiasm for the task is an important attribute for the creative agent. The agent needs to be passionate about her subject, and sustain her interest and curiosity in the completion of the task that she has set herself. Besides commitment to, and caring about, the contents and the methods with which she works, the creative agent needs to be prepared to follow her passion for truth wherever it leads. This may mean that a well tested method or technique needs to be adapted or a conventional way of thinking needs change in order for progress to be made. These changes, however, cannot be made at the expense of lowering the standards that are expected to be adhered to in the field or discipline. The creative agent remains committed to clarity and precision, even as she seeks to break out of the conceptual space that prevents her from finding the solution or resolution of tensions in the task at hand that she seeks.

Extensive experience in a field or a discipline is needed by an agent because if creative work is understood as occurring in a context or a conceptual space then having knowledge of the boundaries of the conceptual space and the techniques and methods available within that space enable the agent to know when he has exhausted the possible approaches to his problem or project. In some cases, knowledge of fields outside the particular discipline may illuminate a problem and help the creative task. For example, an architect may design a revolutionary building, but the placement of the load bearing structures may be such that the particular kind of roof cannot be supported. Knowledge of engineering or materials technology,

however, may enable a solution to be found. Extensive experience, however, in a field is needed before an agent can be sure that he needs to move outside his own discipline.

Immersion in a tradition is vitally necessary for a creative agent because human activity takes place not only in a context but also within a community of others who work within the discipline or field. It is in the company of others that the person learns the methods and techniques that he or she needs in order to pursue his or her project. MacIntyre (1985) argues that creativity will flourish only within a practice because human activity takes place within a particular community of practitioners. Practitioners within a particular community will have developed, over time, a set of beliefs, values and practices which together can be described as a tradition. In order for someone to be able to work within a particular environment he or she will need to be initiated into its practices, its techniques and methods for working. For example, an organic chemist will not only be familiar with various experimental methods, but also their limitations as well as new techniques that have emerged within the discipline. She will also be aware of the standards expected of experimental work in the field and ensure that her work meets those standards. These standards and rules for what counts as good experimental work are determined through peer review by the practitioners themselves. Without being part of a tradition, the creative agent has no resources to draw on to further his or her work, and that includes others who may be working in the same area.

The creative process

The idea of immersion in a tradition is connected to what might be understood as the creative process. Immersion in a tradition begins early in the process of initiation into a discipline. Students can expect to learn how, for example, to write a short story, a philosophical essay or a scientific report. As they immerse themselves deeper into a discipline, they can expect to learn more and more about how those inward to the discipline work. After a period of time, they will have learnt sufficient to be practitioners themselves, which is usually recognised by the award of a credential of some kind. Having mastery of the techniques and methods of a particular field or discipline, however, is no guarantee that a particular problem will be solved or that a particular project can be completed. Where the problem lies within the conceptual space encompassed by the discipline and the problem to be resolved or project to be completed requires no more than the existing techniques and methods, then it can be expected that provided that the agent has sufficient mastery of the techniques and methods of the discipline, that a solution to the problem will be obtained. On the other hand, where the problem or project does not appear to be soluble within the existing parameters of the conceptual framework of the discipline then a new way of thinking about the problem or project needs to be found. In such a situation, there is a tension between what exists within the present horizons of the discipline or field and what lies beyond. A highly creative process will be one which extends the horizons of a discipline and opens up new areas of exploration.

It is worth also commenting that in view of this understanding of the creative process that, though application of a methodology to a problem or to a project does not guarantee its solution, it is not contingent. A process is not regarded as creative if a solution is arrived at simply by chance. Guessing the solution to a problem is not a creative process, neither is rolling dice to decide a course of action. This is not to suggest that chance might not play a part, but to say that even if, as Kekule did, someone dreamt the solution to a problem, this would not be an exercise of creativity. In Kekule's case, he had a dream in which he saw snakes biting their tails and forming rings, on waking, he realised that he had solved the structure of benzene problem he had been working on for some time. Kekule did not, however, cite his dream as evidence of the ring structure of benzene, but rather provided a justification in terms of the bonding properties of carbon. That is, our explanation is in terms of the capacity of carbon atoms to form double and single bonds with each other in such a way that a stable ring configuration can be formed and not explained by appeal to a dream. The logic of discovery and the logic of justification are not the same, but that is not to say that

discovery is a contingent matter. The creative process requires hard work and perseverance and at least until they are exhausted, the use of well established methods and techniques.

Creative processes invariably require time and patience. As we have already remarked, the creative person needs to have mastery of a discipline and be willing to work prolonged hours on his or her project or problem. In many instances, the process also needs time for ideas to gestate. It may be that the solution of the problem needs to wait for developments in other related fields before it can be solved. Developments, for example, in early modern physics were hastened by the discovery of non-Euclidean geometries. The opening up of new areas of exploration and so progress in a discipline does not follow a linear progression and so there may need to be considerable time before any advance is made. There may not be, therefore, any correlation between the resources expended in a particular area and the time it takes for advances to be made. It may be that no advance takes place at all, despite all the energy and effort that is expended. The creative process is not a heuristic or mechanical method that always reaches the goal envisaged. This might be particularly galling for governments intent on reaping economic benefits from their financial support of certain kinds of projects.

The creative product and judgements of value

White (1972:135) says that in the description of something as being creative it is to be understood that it is held to be valuable according to the norms and standards of a particular domain or other. Creativity is exercised within a particular discipline or field of endeavour. Few people, with the possible exception of Leonardo Da Vinci, have been able to make substantial creative contributions to more than one field and with increasing specialisation in modern world, it has become more unlikely. Creativity, as we have shown, is exercised within a context and so it follows that the judgement about the value of something is determined according to the norms and standards of that context. Abinun (1981:27) goes so far as to say that there is a logical connection between creativity and value because he holds that it is logically contradictory to describe someone as creative if he or she has not produced something creative. Abinun is, however, not entirely correct. He is right to say that the concept of creativity involves a judgement value, but this is a conceptual point rather than a logical point. For Abinun, unless someone has produced something that is acknowledged as a creative product, he or she cannot be thought of as creative. However, this is not a logical connection, for we can conceive of someone being thought of as highly creative, but has not as yet fulfilled his or her potential. It follows that conceptually there is nothing wrong with claiming that someone is creative but he or she has not produced a creative product. Moreover, in what we have argued so far there is no guarantee that someone who fulfils the criteria for being a creative person will produce a creative product, since there is no guarantee that a creative process will achieve its goal. On the contrary, as we have been at pains to argue, no matter how creative someone is he or she may not be successful and so fail to produce anything of substance. It may be, for example, that the conceptual framework in which he or she was working was inadequate and so no advances could be made. Unfortunately this is not something that can be predicted and may only be determined in hindsight. Alternatively, he or she may produce a product, but it is simply not valued because the discovery is not seen as particularly important or significant. There is a distinction to be drawn between the task that is undertaken and its completion or what is achieved. Tasks are undertaken with the hope of success not with its guarantee.

In describing the product of creative activity as valuable within a context means that it contributes in some way to the particular field or discipline. This contribution may be large or small and whether it is considered valuable or not will be determined by others working in the field or discipline. It is the agreement of practitioners within the field who decide that the product meets the norms established by the discipline. Thus, a new theoretical development in particle physics will be considered a creative solution if it advances understanding within the field. Similarly, a new technique for splicing sections of genes to a genome, will only be considered valuable if it is judged to be so by the geneticists working in the field. In both cases, it

will be considered valuable because it opens up the horizon for further research by providing an advance that others are able to use. The same may be said about creativity within disciplines such as history or theology. For this reason, certain interpretations of history might judged unorthodox and lacking in value because they do not conform to the rules and norms of the discipline. There are numerous examples of this – arguing, for instance, that the Holocaust did not occur, or that the pyramids were built by aliens. Judgements about unorthodox interpretations of history, of science, etc. are made from within the relevant discipline. Whether these are valuable contributions to the discipline – and hence creative – will depend on the criteria that practitioners use to judge whether something is a serious contribution to the discipline.

The question of whether what has been creatively produced is economically valuable is a separate question, one that is largely external to the process of deciding whether something is creative or not. Thus, an academic who produces a book denying the reality of the Holocaust may produce something which is economically valuable because the book sells a lot of copies, but this does not mean that the product is valuable in itself. Likewise, assessing a creative product of any kind primarily in terms of its economic value is corrupting of the creative research process since it replaces the values internal to a discipline with values that are external to it. This also has the effect of changing the ends for which the creative process is undertaken. Research in science, for example, is undertaken to add to our understanding of the natural world so that we can more readily explain and make predictions about it.[11] In other disciplines, such as history, the purpose is similarly to understand human experience and the forces that have shaped historical events. An artist endeavours to use a particular medium to represent aspects of the world, including abstract ideas, and hence elicit a response in the audience. They may also seek to make us aware of what is ineffable and through the absence in the work of what cannot be represented succeed in alluding to it nevertheless. These too, provide us with insights into the processes that have led to particular events in the world and so guide us in our understanding of human decision-making and hence our own decision-making. Granted that there may be some debate within disciplines about the purposes of the creative research work of the discipline, these are nevertheless debates that occur amongst the practitioners of the disciplines in question. They are not debates between the practitioners and their accountants. That is, the question of what the economic value of a particular creative product in a discipline amounts to is an external question and does not enter into a consideration of the value of something which is considered creative.

The ends of all human endeavour is the good and, given the intimate connection between the individual and the community, the individual flourishes when the community flourishes and vice versa, as we have argued already. Creativity is a part of the cooperative work of human communities in the building of the Kingdom of God or in Kantian terms, the Kingdom of ends. This means that the values and virtues that contribute to this purpose inform and permeate the particular values of a discipline. The pursuit of truth, for example, is constrained by an understanding that certain kinds of techniques and methods of research cannot be used because they harm human beings and undermine the good. Torturing someone in order to learn what the limits of human endurance might be even if it leads to advances in knowledge is never justified. Love of a discipline includes recognition of its role in the building of the community and its contribution to the common good and this will also involve all the moral virtues, honesty, fairness, trustworthiness, generosity and so on. Every discipline and field will be assessed according to how well its practitioners exhibit commitment to the well-being of the community.[12]

The economic value of something is not divorced from a consideration of the common good, since the creation of wealth has the potential to benefit the whole community. Thus, though economic considerations are not internal to the question of whether the outcome of a creative process is valuable, they may have some influence on the kinds of problems and projects that creative practitioners may undertake in a particular field or discipline. Moreover, though the determination that a product is creative is decided by the practitioners of a discipline, this does not mean that it might not also be economically valuable. Its economic value, however, is not the reason for pursuing the project or the solution of the problem, but for reasons internal to the discipline which are themselves based on a more general understanding of common human good.

Since human activity is directed towards human flourishing and the common good, the ends of disciplines or fields of activity are not primarily economic. Where economic ends are pursued in a discipline or field this will be instrumental and not intrinsic. Creativity and its expression as we have argued are assessed according to norms and standards which determine the extent to which the creative product contributes to understanding and advancement of the field. Whether it also results in economic gains is not important in this assessment. This is not to deny that there may be economic benefit to be gained, but to propose that this is not the primary purpose of the creative work in a discipline. By corrupting the ends of a discipline by suborning it to the economic imperatives of government or one's own gain the creative process is corrupted, because the energies and the aims of the project being undertaken are no longer governed by the demands, standards and norms of the discipline itself, but by the purposes of government or one's own ends. The danger is that if economic criteria are applied to judgements about what is to be pursued in a discipline and about what products are to be valued that the internal values of the discipline will be corrupted.[13]

The skewing of creative effort by preferential treatment of certain areas of research by the allocation of resources by government to what it regards as areas of national priority has its perils. As indicated, in any area of creative human endeavour there is never any guarantee of success and the advances that are made may show little return on the resources that have been allocated. The cost, for example, of building larger and larger particle accelerators to test various theories is becoming prohibitively expensive and raises the question of whether this area of research should remain a priority. The possible lack of success in any research area has the potential to skew the creative effort and its products into areas where there is a high probability of success. It follows from this that the kinds of research that will be undertaken will stick closely to established paradigms and will not seek to be innovative or push boundaries. It is unlikely, that a project which proposes something radical will gain support. Though creative outcomes will still be achieved, these will not be of the novel and innovative kind that have the power to transform a discipline and open up new avenues of research. Paradoxically, the greater the resources available, the more artists and researchers may take a conservative approach to their work and so take fewer risks, thus producing work that is safe because they want to safeguard funding. Hence, highly creative work which is risky is not pursued.

The valuing of the creative product, it has been proposed, has several components. What is produced has to be seen within the context or conceptual space within which it is produced. This means that it will be assessed according to the norms and standards of a particular discipline or field of activity. Secondly, the norms, standards and practices of a particular discipline or field of human activity are themselves to be measured against those overarching moral virtues that inform all human activity. If creative work in a particular sphere of human endeavour does not in some way contribute to human well-being and flourishing then the field of activity or discipline is corrupted and though it might judge certain outcomes as creative according to its own lights, it is not creative in the sense we are outlining here. Creative accounting, so-called because it uses the methods of accounting to provide a false financial picture is not creative in the sense we have sketched. It undermines the common good, as well as the norms and standards of the profession. Thirdly, valuing a creative product on economic grounds is an application of an external measure which suborns the internal evaluative processes of a discipline or field of activity and hence provides a false measure of value of the creative product.

Creativity and Subversion of the State

We began by remarking that creativity is radical, taking our cue by reflecting on the idea of *creatio ex nihilo*. Although human beings do not create in this radical way, nevertheless, through the bringing of children into the world they participate in a very fundamental way in bringing about what is new – and we may add – renewing of the world. Creativity in this basic sense overthrows the existing order and introduces change. Creativity breaks through into our world in the flourishing of human beings and the building up of loving human communities and education is primarily an activity directed towards this central aim. Creativity in the

classroom involves being able to provide the learning spaces in which pupils will be able develop their talents and capacities, as well as be formed as moral persons. The creative teacher in this context is one who understands the very serious responsibility that she has in this process, cares about her subject, loves her students and has a serious commitment to the art of teaching. Despite this, through no fault of the teacher, however, children may fail to learn and may not flourish.

Insofar as education has been operationalised through the setting of clearly defined targets, measurable outcomes and clearly defined generic skills, the conceptual space in which creativity in teaching and learning can take place is narrowed. The codification of every aspect of educational practice is an attempt to reduce education to basic elements that can be standardised and delivered as efficiently as possible. It is as if an industrial model of mass production has been adopted for education, with teachers becoming little more than assembly line workers. Education is no longer seen as development of persons, but as the delivery of a product to a customer. Codification of the product ensures that quality control can be exercised so that what is delivered is what has been specified in detail in the curriculum. The dead hand of government bureaucracy attempts to stifle the creative classroom through the narrowing of the space in which human development can occur.

Creativity in the classroom seen as the attempt to broaden the conceptual space in which teaching and learning can take place is subversive, for by its nature, it seeks to break out of the order that is imposed by government endorsed curricula and the unidimensional view of human beings as customers or consumers of educational product. The industrial model of education does not call for the questioning of the existing power structures of society nor of notions of the common good. It assumes that the existing order is the best of all possible worlds. Education is concerned with the development of human beings to their full capabilities and this is not narrowly conceived as the gaining of a few generic skills that will render them employable. It is also concerned with the contribution that they can make to creating anew the society in which they live. This means that to foster creativity in educational setting the operationalisation of education must be resisted. Fostering creativity will therefore be a subversive activity.

Creativity is just as subversive in other spheres of activity. In our analysis we identified three components of creativity, the creative agent, the creative process and the creative product. In addition to these, we identified an evaluative dimension which enabled us to judge whether a product could be described as being creative. The norms and standards of judgement, we argued, were internal to the discipline or field of human activity. Questions of the economic value of what is produced, it was suggested, were external to the determination of whether it was a creative product or not. Where economic considerations entered discussion of whether a product is creative, the norms and standards of the discipline or field of activity will be corrupted. Undoubtedly the provision of resources by governments to researchers to undertake certain kinds of projects will aid them in their work, but given the nature of creativity, it may not yield a creative product. Moreover, given that creativity pushes boundaries of a conceptual space, it may be that what is created will be unexpected. In this sense, governments will seek to avoid funding activities where the outcome may not be foreseen. This may serve to restrict funding to scientific projects where outcomes are quantifiable rather than projects in the humanities and creative arts where outcomes are less easy to quantify. This will discourage genuinely creative activity.

Conclusion

The exploration of creativity that we have undertaken here distinguished its key features and though it might be concluded that in its highest form it can be described as an eruption of what is radically new, the surprising thought is that this highest form is not the invention of a new theory nor a new discovery, but the flourishing of human beings and the building of loving human communities. This process by its nature overturns the existing order and is subversive. Creative activity, of course, does also include the creative activities of practitioners in disciplines and fields of activity, but, since the talents, abilities and, we might

add, the opportunities for their exercise, are not equal for all human beings, not all creative products can be expected to be of the highest level. Creative products will therefore differ in their value as determined by the standards and norms internal to the field of activity or discipline. It follows from this that external criteria such as the economic value of a product are not included in the evaluation of the level of its creativity. The subversive thought here is that the creative person might well be prepared to pursue completion of a project purely because of a love of truth rather than whether there is the possibility of lucrative financial gains in the exploitation of the creative product.

Notes

1. One of the reasons offered for the demise of former Australian Labor Party Opposition Leader in the Australian parliament, Mark Latham, was that he appeared to be too unpredictable and the public could not be sure that he would not simply change policies without giving matters thorough thought. Latham's lack of judgement and instability is brought out in his own memoirs of his time in office. See Latham, M. (2005) *The Latham Diaries* (Carlton, Victoria, Melbourne University Press).
2. See, for example, Robinson, K. (2001). Robinson argues that creativity is important because it enables rapid response to the changing global economic climate and to increasing competition. The rapidity of technological change demands new and innovative solutions to the new problems to which these changes give rise. Somewhat contrary to the psychological literature on the subject, Robinson suggests that creativity can be taught, though does not elaborate.
3. Aquinas says the following in relation to the creative power of God: "For it is evident that every agent acts according as it is in act. But every created agent is limited in its act, as being of a determinate genus and species; and consequently the action of every created agent bears upon some determinate act. Now the determination of every thing in actual existence comes from its form. Consequently, no natural or created agent can act except by changing the form in something, and on this account, every change made according to nature's laws is a formal change. But God is infinite act, as stated in I, 7, 1; 26, 2; hence His action extends to the whole nature of being." See Aquinas, *Summa Theologica* III, Q.75, Art. 4.
4. See Illich, I. (1973) *Deschooling Society* (Harmondsworth, Penguin); also, Friere, P. (1979) *Pedagogy of the Oppressed* (London, Sheed and Ward) ;Goodman, P. (1971) *Compulsory Miseducation* (Harmondsworth, Penguin) ; Neill, A.S. (1968) *Summerhill* (Harmondsworth, Penguin).
5. For example, it took several decades of argument between Newtonians and Cartesians to reach an understanding about the distinctions between elastic and inelastic collisions and what was conserved in these collisions. Typically, students in a physics class might be asked to confirm whether the total momentum of two colliding pucks before collision is the same as the total momentum after collision. They will not be expected to determine what momentum is, nor to design an experimental method for testing the Law of Conservation of Momentum. In testing the Law they will have discovered something for themselves, as well as exercised their ingenuity. They may also have been creative in suggesting a refinement to the experimental method employed.
6. For example, a teacher of mathematics may plan a lesson on π , the ratio between the circumference of a circle and its diameter in which the students are asked to measure the circumference and diameter of a number of circular objects and then calculate the ratio between them, expecting that they might get an answer somewhere around 3.14, or at least 3. The pupils may undertake the exercise with enthusiasm, but in their calculations find that their measurement techniques are too poor and do not arrive at an answer approaching the value of π. They may learn that though the right (classroom and for assessment) value of π is meant to be 3.14, but in the real world that it is not. This could lead to scepticism about the value of mathematics in the real world.
7. In *Evangelium Vitae*, John Paul II says the following: : "When a new person is born of the conjugal union of the two, he brings with him into the world a particular image and likeness of God himself: *the genealogy of the person is inscribed in the very biology of generation*. In affirming that the spouses, as parents, cooperate with God the Creator in conceiving and giving birth to a new human being, we are not speaking merely with reference to the laws of biology. ….. Begetting is the continuation of Creation." (Paragraph 31)
8. Balkin (1990) also sees creativity as having these three components.
9. These five characteristics are adapted from Abinun (1981).
10. Sufficient intelligence to master a discipline is said here because at the highest level of creativity, high intelligence is required, otherwise the agent will be unable to contribute in a creative way to the furthering of knowledge, or solving a problem or completing a project. If creativity admits of gradation, then it is possible for persons to make creative contributions of a lesser kind. Few will exhibit the creativity of a Newton or a Da Vinci or a Shakespeare. Creativity is also a function of a community working in a particular field or discipline. Newton's famous statement, "If I have seen further than others it is because I have stood on the shoulders of giants.", emphasises this point. We will return to this point later.

11. Granted though there may be some theoretical discussion to be had between scientific realism and constructive empiricism about what it is that we are discovering. See for example, Leplin (1984); Van Fraassen (1981).

12. Notwithstanding this claim, it might be argued that just because, say, an eminent scientist is having an affair with his colleague's wife and regularly has other affairs with his research students, does not mean that his work is not creative. He may well be able to do excellent work within his discipline despite these weaknesses. This much can be conceded. One would nevertheless expect that the eminent scientist would not act corruptly by favouring, say, the advancement of his latest paramour rather than someone with real ability. Such corruption would do harm to the discipline itself since the best minds would be prevented from working on whatever the research work happened to be

13. The effect of government ideology and interference in the scientific area is amply illustrated by the Lysenko case during the Stalin period. Lysenko's theories in the nineteen thirties in Soviet Russia were promoted because they accorded with Marxist orthodoxy, rather than with scientific theories of heredity held by most geneticists at the time. See Joravsky, D. (1986)

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