Tackling the Wicked Problem of Creativity in Higher Education

Background paper for a presentation
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Creating Value: Between Commerce and Commons

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Born in Manchester, Norman studied geology at Kings College London University. After completing his doctorate on tin mining in SW England, he spent eight years studying the geology and searching for minerals in the deserts and mountains of Saudi Arabia.

In 1990 he joined Her Majesty's Inspectorate as geoscience inspector and this led him into higher education as a field of study: although he believes that he still thinks and acts like a geologist.

Norman has held senior posts with the Higher Education Quality Council, Quality Assurance Agency and prior to coming to Surrey, with the Higher Education Academy and the Learning and Teaching Support Network where he led research and development work on the curriculum, personal development planning, external examining and creativity. He also led the development of the 'Change Academy' an innovative team-based approach to planning for significant institutional change.

His work on creativity in higher education began In 2001 when he initiated the imaginative curriculum network and a programme of work aimed at developing understanding of the meanings of creativity in higher education and the ways in which learners' (and teachers'!) creative development is supported and encouraged. Some of this work is published in a book by Routledge-Falmer, 'Developing Creativity in Higher Education: an imaginative curriculum.'

Understanding creativity is important in SCEPTrE's work as it helps the university prepare students for working and learning in a complex world. We live in a world where change is exponential and we are currently helping to prepare students:

- for jobs that don't yet exist
- using technologies that have not yet been invented
- in order to solve problems that we don't know are problems yet.

Creativity in higher education is embedded in the wicked problem of how we prepare and sustain learners for a lifetime of uncertainty, change, challenge and emergent or self-created opportunity and they will need not only their intellectual ability, practical skills and will to survive and prosper, but also their imaginations and practical creativity.

This Working Paper summarises my current thinking on the problem of creativity in higher education and how it might be tackled. It was prepared as background paper for a presentation at the International Conference held in Brisbane June 2008 'Creating Value: Between Commerce and Commons' organised by the ARC Centre of Excellence for Creative Industries and Innovation. A set of powerpoint slides can be found at:
http://normanjackson.pbwiki.com/2008

why creativity is worth thinking about

for the sake of the economy!

'Work in the modern British economy will increasingly involve creativity and innovation as a mass and everyday activity, applied not just to leading edge high-tech and cultural industries, but to retailing and services, manufacturing and sales. Britain will need an education system that encourages widespread development of generic skills of creativity which include: idea generation; creative teamwork, opportunity sensing; pitching and auditioning; giving criticism and responding to it; mobilising people and resources around ideas to make them real…'[1]

[1] 'Nurturing Creativity in Young People: A report to Government to inform future policy (Department for Culture, Media and Sport, DCMS 2006a).

for the sake of society!

> 'Education worldwide faces unprecedented challenges: economic, technological, social and personal. Policymakers stress the urgent need to develop 'human resources' – in particular, creativity, adaptability and better powers of communication. All our Futures argues that this means reviewing some of the most basic assumptions about education. It means new approaches and priorities based on broader concepts of young children's abilities of how to motivate them and promote their self-esteem, and of developing the skills and aptitudes they require – and this means a much stronger emphasis on creative and cultural education.'[2]

> 'Pupils who are creative will be prepared for a rapidly changing world where they may have to adapt to several careers in a lifetime. Many employers want people who see connections, have bright ideas, are innovative communicate and work well with others and are able to solve problems. In other words they need creative people….Creative pupils lead richer lives and, in the longer term, make a valuable contribution to society'[3]

for personal wellbeing and identity

> 'Even though personal creativity may not lead to fame and fortune, it can do something that from the individual's point of view is even more important: make day-to-day experiences more vivid, more enjoyable, more rewarding. When we live creatively, boredom is banished and every moment holds the promise of fresh discovery. Whether or not these discoveries enrich the world beyond our personal lives, living creatively links us with the process of evolution' (Csikszentmihalyi 1996:344).

One of the most important messages to come out of the research we have undertaken in the imaginative curriculum project is that creativity lies at the heart of students' own sense of who they are.

> 'even where creativity was not taught, not considered teachable and not valued in assessment, it was still relevant in defining how the students saw themselves' Oliver et al (2006).

Higher education has a responsibility to help learners develop their understandings and awareness of their own creativities as they develop their own identity – an important part of which is the creative expression of who they are. The capacity of higher education to support identity building (the self in the three higher education curriculum projects of knowledge-action-self) has been heavily criticised by Barnett and Coat (2004) and a concern for students' creative development would help address this weakness.

If creativity is central to being, then higher education needs to understand what it means to be creative in the many domains it embraces e.g. historian, biologist, lawyer, engineer or any other disciplinary field of endeavour (Jackson and Shaw 2006). We need to raise awareness of what creativity means in these different contexts and encourage educators to support forms of learning that will enable students to develop the forms of creativity that are most appropriate for their field(s) of study and future careers.

creativity in HE value proposition

The basic value proposition underpinning this work is inspired by the moral purpose of education: to make a positive difference to students' lives (Fullan 2003: 18). If the purpose of higher education is to help students develop their potential as fully as possible, then enabling students to be creative should be an explicit and valued part of their higher education experience. This is clearly not the case in 2008.

Valuing and recognising the creativity of our students is one small step towards creating a more creative society: something that ultimately the health of our economy depends. I see higher education's role as: a) to help people develop as creative individuals because this is the foundation for a more creative society and b) to provide access to domains, the training necessary to build a creative life in a domain and access to the field of people who are already experts in the domain. In the words higher education has an important role to play in society enabling people to move from personal to cultural creativity.

[2] All our Futures: creativity, culture and education (Department for Education and Skills, DfES 1999)

[3] 'Nurturing Creativity in Young People: A report to Government to inform future policy (Department for Culture, Media and Sport, DCMS 2006a).

> 'to move from personal to cultural creativity one needs talent, training and an enormous dose of good luck. Without access to a domain, and without the support of field, a person has no chance of recognition' (Csikszentmihalyi 1996:344)

Because of this we need to see creativity not as a stand alone skill but as part of a package of dispositions, qualities and capabilities for being successful in whatever domains learners chose to live and work.

Sternberg and Lubart (1995) make this point by arguing that we need three different sorts of abilities to be successful: *analytical abilities* – to analyse, evaluate, judge, compare and contrast; *practical abilities* – to apply, utilise, implement and activate; and *creative abilities* – to imagine, explore, synthesise, connect, discover, invent and adapt. Successful people (people who generally achieve their ambitions and goals) do not necessarily have strengths in all areas, but they find ways to exploit whatever pattern of abilities they may have in any given situation or context and align them in a way that value and meaning is created in their lives and in the communities they inhabit in any given situation or context.

For a useful insight into what it takes to be successful in a domain take a look at Richard St. John's 'Secrets of success in eight words' video clip. It's well worth watching**.**
http://www.ted.com/index.php/talks/view/id/70

The wisdom in this video clip is that individuals' successful use of their own creativity to effect cultural change depends on a whole lot of other things than having a creative mind like:

- Passion
- Drive / ambition: being able to push yourself
- Hard work
- Staying focused
- Getting good at doing things
- Being determined and persevering
- Having the will to succeed and to be creative

And the good thing is that teachers recognise this Figure 1.

Higher education needs to see creativity in the context of these other things that give energy and meaning to creative enterprise. These other things are as important to academic success as they are to business success or success in any other situation that has to be mastered. But all too often we focus learners' attention on the things that we are passionate about: if we really want creativity to flourish we have to be receptive to things that they are passionate about.

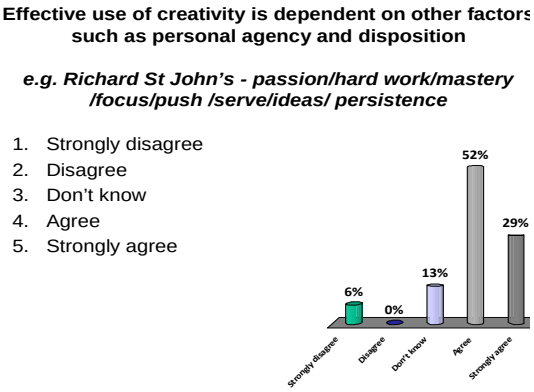


Figure 1 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

some assumptions

There is an assumption underlying what follows, that creativity is important and necessary to achieving difficult things and to our individual and collective well being (not withstanding the fact that creativity can also result in bad things). The world needs people who can combine their knowledge, skills and capabilities in creative and adventurous ways to find and solve complex problems. Creativity is important to our inventiveness, adaptability and productivity as individuals, and to the prosperity and functioning of organizations and to the health and prosperity of our society and economy.

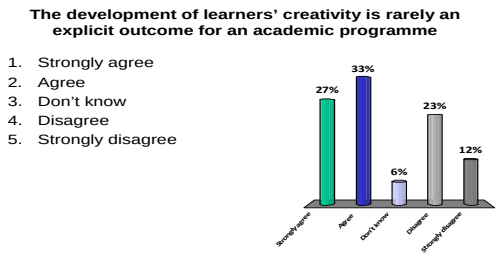


Figure 2 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

A second assumption is that we barely acknowledge its existence in most fields of higher education. The problem with higher

education is that it pays far too little attention to students' creative development. Creativity as an explicit and desirable outcome of higher education, at least in the UK, is more by accident then design.

A third assumption is that the teaching and learning process, with all its complexity, unpredictability and endless sources of stimulation from the subjects that are taught or practiced in the field, is an inherently creative place, and there are many potential sites for creativity embedded in the professional act of teaching. Creativity emerges spontaneously through the relationships and interactions of teachers with their students in highly specific and challenging situations and most teachers recognise. Indeed most higher education teachers see creativity as being important to their identity and success as a teacher.

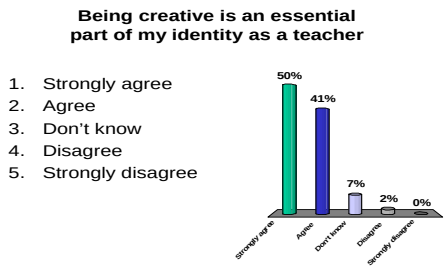


Figure 3 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

Lesley Saunders' provides a helpful synthesis of how creativity features in the role of the *professional educator* (Saunders 2004 p163).

> '…teaching is a highly complex activity – it needs both the appliance of science and the exercise of humanistic imagination; it demands scholarship, rigorous critical enquiry, the collective creation of secure educational knowledge, on the one hand, and it requires insight, inspiration, improvisation, moral sensibility and a feel for beauty, on the other …. Similarly, we are often encouraged to think about research mainly in terms of systematic and reliable ways of gathering and analyzing empirical data. However, research is also much more than empirical data gathering: it includes theory-building, hypothesis-testing, critical analysis and appraisal, evaluation, and the synthesis of concepts and evidence from a range of different disciplines – all of which are crucial for informing practice at deeper levels – research in this sense also happens to be rooted in imagination, intuition and aesthetic awareness… as well as cognition and disquisition.'

If these assumptions are right then our problem is best visualised as an opportunity to engage more systematically with the idea of creativity in tertiary level learning and teaching. We also have the wonderful situation of many people who have, within their own day-to-day practice, many possibilities for being creative, who can make a real difference to students' own creative experiences by what they do.

A fourth assumption is that we have constructed many barriers and inhibitors to creativity. Higher education seeks to satisfy many purposes and goals and some of these conflicts. Barriers include: staff and student attitudes/resistances/ capabilities/interests; organizational – structural, cultural, procedural; time and other resources; government policy…

But it is not enough for educators to overcome such barriers through their own ingenuity and persistence, ultimately, organizational systems and cultures themselves have to be changed. Such changes have to be led through sympathetic, inspiring and energetic leaders. A fifth assumption is that we will not change the conditions for creativity in higher education unless we can persuade the leaders and decision makers that it is worth doing.

Paradoxically, our sixth assumption is that we can all do something about this state of affairs.

Between stimulus and response there is a space. In the space lies our freedom and power to choose our response. In those choices lie our growth and our happiness. Covey (2004: 4)

Everyone who is involved in the education of students can change the way he/she thinks and acts, every group of teachers responsible for creating students' educational experiences can choose or not choose to provide experiences that will help students' develop their creative potential, and every institutional decision maker can shape policy, strategy or management practices so that creativity will flourish or be inhibited. So I am making an assumption that by drawing attention to this matter and facilitating

conversation and debate about the role of creativity in higher education and the fields of endeavour it embraces, we have the potential to change the way people think and behave and encourage a culture that is more valuing of creativity and more knowledgeable of its effects in and beyond higher education learning.

what is a 'wicked problem'?

Most solutions to problems lie in their exploration so its worth spending time on thinking about the problem of creativity in higher education.

Preparing our students for a lifetime of working, learning and living in uncertain and unpredictable worlds that have yet to be revealed is perhaps one of the greatest responsibilities and challenges confronting universities all over the world. We live in a world where change is exponential and we are trying to tackle the 'wicked problem' (Rittel and Webber 1973) of preparing students for jobs that don't yet exist, using technologies that have not yet been invented, in order to solve problems that we don't know are problems yet.

In 1973, Rittel and Webber, two Berkeley professors, published an article in *Policy Sciences* introducing the notion of "wicked" social problems. The article, "Dilemmas in a General Theory of Planning," named 10 properties that distinguished wicked problems from hard but ordinary problems.

1. There is no definitive formulation of a wicked problem. It's not possible to write a well-defined statement of the problem, as can be done with an ordinary problem.

2. Wicked problems have no stopping rule. You can tell when you've reached a solution with an ordinary problem. With a wicked problem, the search for solutions never stops.

3. Solutions to wicked problems are not true or false, but good or bad. Ordinary problems have solutions that can be objectively evaluated as right or wrong. Choosing a solution to a wicked problem is largely a matter of judgment.

4. There is no immediate and no ultimate test of a solution to a wicked problem. It's possible to determine right away if a solution to an ordinary problem is working. But solutions to wicked problems generate unexpected consequences over time, making it difficult to measure their effectiveness.

5. Every solution to a wicked problem is a "one-shot" operation; because there is no opportunity to learn by trial and error, every attempt counts significantly. Solutions to ordinary problems can be easily tried and abandoned. With wicked problems, every implemented solution has consequences that cannot be undone.

6. Wicked problems do not have an exhaustively describable set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan. Ordinary problems come with a limited set of potential solutions, by contrast.

7. Every wicked problem is essentially unique. An ordinary problem belongs to a class of similar problems that are all solved in the same way. A wicked problem is substantially without precedent; experience does not help you address it.

8. Every wicked problem can be considered to be a symptom of another problem. While an ordinary problem is self-contained, a wicked problem is entwined with other problems. However, those problems don't have one root cause.

9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. A wicked problem involves many stakeholders, who may all have different ideas about what the problem really is and what its causes are.

10. The planner has no right to be wrong. Problem solvers dealing with a wicked issue are held liable for the consequences of any actions they take, because those actions will have such a large impact and are hard to justify.

The world is full of wicked problems just visit the BBC World News web page to see a sample of the intractable problems that beset the world today http://news.bbc.co.uk/1/hi/world/default.stm

The world needs people who can combine their knowledge and talents in creative and adventurous ways to work with such complexity to find better and more sustainable solutions, create value, enrich our societies and cultures, and enhance their own sense of identity and wellbeing in the process.

Compared to some of the world's wicked problems, the problem of creativity in English or any other higher education system may seem trivial. But I would argue that the problem of creativity in any education system is fundamental to enabling mankind to grapple with the wicked problems that emerge from all the

social, cultural, political and technological and complexity that surrounds us on a planet that itself is full of complexity.

Preparing learners who can engage with the problems that emerge from increasing complexity is higher education's 'wicked problem' and creativity is an important facet of this problem.

Figure 4 SCEPTrE's symbolic picture to represent the idea of learning in and for a complex world

The problem is that higher education values above everything else individual academic achievement while preparing people for a lifetime of cooperation and co-creation. Our educational programmes demand conformity and prescribe learning outcomes that only value learning that we expect, while we espouse the desire for originality in the products of learning. And our emphasis on formal learning and explicit knowledge at the expense of the tacit and informal is at odds with the epistemologies of successful practice in work environments.

The key challenge is to change the prevailing culture so that greater value is placed on students' creative development alongside more traditional forms of academic development. Perhaps a more useful way of visualising the 'problem' is to see it as an opportunity to appreciate what we already do to develop students' creative potential and a challenge to imagine new and better ways of developing and using their creativity so as to make a positive difference to their lives.

so what is the problem?

A wicked problem has innumerable causes, is tough to describe, and doesn't have a right answer (Camillus 2008). Through many discussions, surveys and some small scale research studies we came to understand the problem of creativity in higher education in these sorts of ways.

1 Our problem is not chronic, in the sense that the vast majority of teachers believe there is an issue to be addressed. It is more a sense of dissatisfaction with a higher education world that seems, at best, to take creativity for granted, rather than a world that celebrates the contribution that creativity makes to academic achievement and personal wellbeing.

2 Our problem is not that creativity is absent but that it is omnipresent. That it is taken for granted and subsumed within analytic ways of thinking that dominate the academic intellectual territory. Paradoxically, the core enterprise of research – the production of new knowledge – is generally seen as an objective systematic activity rather than a creative activity that combines, in imaginative ways, objective and more intuitive forms of thinking. The most important argument for higher education to take creativity in students' learning more seriously, is that creativity lies at the heart of learning and performing in any subject-based context and the highest levels of both are often the most creative acts of all. Our problem then becomes one of co-creating this understanding within different disciplinary academic communities.

3 Although teaching and designing courses are widely seen as sites for creativity: teachers' creativity and creative processes are largely implicit and are rarely publicly acknowledged and celebrated. Teachers are reluctant or unable to recognize and reveal their own creative thinking and actions in the many facets of their practice. Trying to achieve cultural change in this area is a massive job but in the last 10 years the introduction of National Teaching Fellows and institutional teaching fellowships which evidence and publicly reward individual teachers' commitments to teaching and innovation are tangible ways in which teachers' creativity is being recognised and encouraged. Similarly, I think the main purpose

of the 74 CETLs[4] set up in England in 2005/06, is to encourage and reward creative teachers. The pity is that not all higher education institutions were provided with the resources to do this. We have a long way to go before the unique creative contributions teachers are valued and recognized.

4 Although we expect students to be creative, creativity is rarely an explicit objective of the learning and assessment process (except for a small number of disciplines in the creative arts). Creativity is inhibited by predictive outcome based course designs, which set out what students will be expected to have learnt with no room for unanticipated or student determined outcomes. Assessment tasks and assessment criteria that limit the possibilities of students' responses are also significant inhibitors of their creativity.

Higher education occupies a privileged position in providing educational opportunities that engage people in complex learning and problem working – ideal conditions for the development of creative human potential. Yet all too often we squander the opportunity to help learners develop their creative talents, preferring conformance and compliance to more radical and less predictive responses and penalising mistakes rather than seeing them as valuable opportunities for learning.

5 For teachers whose motivation derives primarily from their passion for their subject, creativity only has meaning when it is directly associated with the practices and forms of intellectual engagement in their discipline. Many teachers find it hard to translate the generic language and processes of creativity into their subject-specific contexts. Conversely, many higher education teachers have limited knowledge of creative approaches to teaching even within their discipline. Most higher education teachers are unfamiliar with the body of research into creativity and how creative thinking techniques can be used to facilitate problem working. So the problem becomes one of growing awareness and understanding of the meanings of creativity in the discipline and of persuading teachers that teaching for creativity is no more or less than good teaching to achieve particular outcomes in disciplinary learning.

6 While many higher education teachers recognize the intrinsic moral value of promoting students' creativity, they baulk at what they perceive as the additional work necessary to successfully implement more creative approaches. Furthermore, any conversation about creativity raises many issues and barriers in the work environment that people believe inhibits or stifles their attempts to nurture creativity. Paradoxically, for some teachers these barriers are themselves catalysts for creativity.

7 Moving outside the academic world, many teachers, particularly those who have only known the academic world, find it hard to imagine life outside the academy, and to appreciate that success in the trans-disciplinary world does require people to be creative in ways that are not determined by ways of thinking and being in their discipline, and do involve creativity through collaborative enterprise.

8 The final point I'd like to make about the wickedness of the creativity problem in higher education is that the sheer complexity of the concept of creativity is itself a potential barrier to a) persuading the academy that we can support learners' creative development and b) enabling the academy to operationalise the idea in any meaningful way.

Taken together – it is hard to imagine a more difficult set of conditions to work with. Making any headway requires winning the hearts and minds of leaders, colleagues and students, changing the systems and environments we work and learn in. Grappling with such a wicked problem is going to require all our ingenuity in bringing about change and finding and encouraging sympathetic, inspiring and energetic people to lead change. The problem of creativity in higher education is also one of leadership at all levels.

confounding complexity

The complexity of creativity is a confounding issue for higher education teachers who are often deeply perplexed by the whole idea of

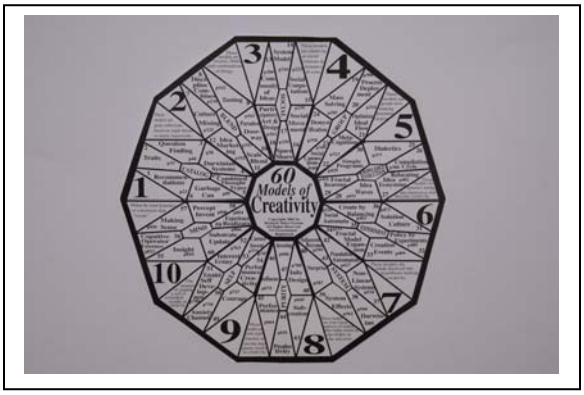
[4] There are 74 Centres for Excellence in Teaching and Learning in England set up with a 5 year Government grant to reward excellent teaching practice and invest in that practice in order to increase and deepen its impact across a wider teaching and learning community.

developing practice to support students' creative development. What exactly is it they are trying to develop?

Richard Greene, a Professor of Knowledge Management, has probably done more to reveal the complexity of creativity than anyone else I know.

Through interview and questionnaire approaches involving 150 highly created people from 63 diverse stratas of society, half US half global he identified 60 models of creativity he identifies at least 60 personalised models that are in the minds of creative people when they create. From his study Greene concludes that anyone treating creativity as one thing (for example: businesses seeking environments to support creativity) is not only failing to support most of it, but is probably hurting more creation than it is helping.

Figure 5 60 models of creativity (Greene 2006)



This way of representing creativity as personally constructed perceptions of real creative practice in the situations in which people try to be creative is novel and inspiring. On the one hand such models align well with the idea of personalised learning but the diversity and individualistic representations make it practically difficult to implement for HE educators who prefer simpler capability/competency frameworks to work with. One of the problems that such diversity brings for educators (Greene 2006:6) is that trying to facilitate creativity according to only one or a few general models of creativity may reduce overall creativity of people who use other models. Alternatively, we might argue that doing something to promote and value creativity is better than doing nothing. The important thing is to raise teachers' and students' awareness that many models exists.

Greene's models of creativity based on the self-analysed creative practices of creative people, expressed as minimal statements in a questionnaire, are shown in Appendix 1. Although, with careful reading higher education teachers would recognise their own creative practices in some of these models, using these models as a trigger to design educational experiences that will help learners develop creatively in ways that are consistent with any particular model (which may not be creatively meaningful to an individual), is a very different matter.

Perhaps a more useful starting point for higher education teachers and learners would to use the 60 models questionnaire as a tool to help them think about their own creative processes and practices in the predominantly disciplinary contexts in which they teach and compare these with the models they use in the trans-disciplinary contexts in which they spend the rest of their lives.

A second lesson that might be learned from Greene's work is to encourage learners, through well designed thinking tools and facilitated conversation, to reflect on and develop their own models of how they are creative.

We will return to these personalised identity-based models of creativity again but for now let us make an assumption that to engage most higher education teachers we have to begin with what they understand by creativity – bearing in mind that what they chose to reveal is likely to be a greatly simplified explanation of what they really understand. But before we focus on higher education it is worth reviewing the broader context in which work on creativity in UK higher education sits.

tackling the problem of creativity in UK society

According to Richard Bingham-Smith (2006:12), in UK policy discourse creativity is largely associated with: 1) culture (especially the arts), 2) business with respect to the creative industries, the wider creative economy and the need for a culture of innovation, 3) knowledge transfer between universities and business 4) education (primarily pre-16 to date) and

enterprise / entrepreneurship education across all phases of education.

Creativity as a focus for Government interest is a theme that is shared by a number of Departments. In 2008 these include:

- Culture Media and Sport (DCMS)
- Children Schools and Families (DCSF)
- Innovation, Universities and Skills (DIUS)
- Business, Enterprise and Regulatory Reform (BERR)

The recent establishment of a Department for Innovation, Universities and Skills signals the Government's intent to seek a better connection between universities and its innovation agenda.

But developing a coherent and well connected 'innovation system' takes time and we have seen a decade of policies and supportive initiatives that have begun the process of societal engagement but which do not as yet form an integrated joined up innovation system. Nevertheless, there is evidence in the open discourse of policy makers (Bingham-Smith 2006) of an appreciation of the wickedness of the issue and opportunity afforded by the complex problem of creating a more creative and innovative society.

In 1999 the UK's National Endowment for Science, Technology and the Arts (NESTA) was established to act as the Governments principle active agent for engaging the creative industries and more recently the issue of creativity in the wider economy. Its formation was based on a background belief that highly creative and talented people were not finding support from existing funders and investors and the UK needed a more dynamic and risk-taking culture. NESTA has a pluralistic view of creativity and innovation and its investment strategy is responsive to different aspects of its agenda working across all phases of the education system and the creative industries.

NESTA has sponsored/brokered surveys, has worked in partnership with the Department for Culture, Media and Sport and undertaken mapping exercises and research into the Creative Industries. Its policy briefings identify concisely the direction of travel that higher education needs to be aware of and connect to.

Policy for the creative industries[5]

The UK has the largest creative sector in the EU. Mapping undertaken by the Department for Culture Media and Sport (DCMS 2001) identified thirteen creative sectors 'those industries that have their origin in individual creativity, skill and talent and which have the potential for wealth and job creation through the generation and exploitation of intellectual property'.

Policy makers have sought to provide support for creative industries through programmes targeted at individual sectors. The Creative Economy Programme has explored a number of issues with the industries themselves. Business support schemes have provided small creative firms with advice and mentoring. Business Link operators act as brokers between creative businesses and a wide range of business. Knowledge transfer schemes have encouraged collaboration between universities, colleges and creative businesses. Most of the Regional Development Agencies[6] target the creative industries.

There is a growing belief that the creative industries have an important role to play in supporting business innovation in the economy. The Cox Review of Creativity in Business stressed the importance of design to the UK economy. The Design Demand Programme has been implemented in five Regional Development Agencies and 6000 businesses are expected to access support by 2010.

In 2007 NESTA launched a major Arts and Innovation programme aimed at understanding the extent to which creative industries stimulate

[5] (NESTA Policy Briefing February 2008)

[6] Eight Regional Development Agencies (RDAs) were established under the Regional Development Agencies Act 1998, and were formally launched in eight English regions on 1 April 1999. The ninth, in London, was established in July 2000 following the establishment of the Greater London Authority (GLA). BERR has responsibility for sponsorship of the RDAs since 2007.Their primary role is as strategic drivers of regional economic development in their region. The RDAs aim to co-ordinate regional economic development and regeneration, enable the regions to improve their relative competitiveness and reduce the imbalance that exists within and between regions.

innovation in the wider economy. Evidence is emerging that there is a link between firms that have business to business links with creative industries.

NESTA working with the Centre for Excellence for Creative Industries and Innovation (Queensland University of Technology Australia) has mapped the UK's creative economy.

The creative trident model focuses on three types of employment which collectively form the creative workforce.

1 Specialist – artists, professionals or creative individuals working in the creative industries
2 Support – staff working in the creative industries who provide management, secretarial, administrative and accountancy back-ip
3 Creative individuals embedded in other industries not defined as creative.

The NESTA policy briefing concludes that policy makers need better data on where creative activity takes place and encourages policy makers to move beyond industry-based approaches to thinking about creativity within the wide economy.

An important recommendation for higher education is that DCMS should work closely with the Department for Innovation, Universities and Skills and the Department for Business, Enterprise and Regulatory Reform (BERR) to ensure that creativity is embedded in innovation and enterprise policies across Government.

Policies for pre-16 education

Government is interested in four areas of creativity: the ability of the education system to turn out a large supply of creative people. In policy terms it has chosen to focus attention on the pre-16 curriculum. Anna Craft (2006) provides a good overview of the way in which the wicked problem is being tackled in this phase of education. During the late 1990s three major curriculum-based initiatives occurred:

- the commissioning of a large scale review of creativity in the pre-16 curriculum by the National Advisory Committee on Creative and Cultural Education, culminating in a significant report 'All our Futures' (NACCCE, 1999).
- the work of the Qualifications and Curriculum Authority (QCA) and Department for Education and Employment (DfEE) to identify and embed 'creative thinking skills' as a key skill in the National Curriculum (DfEE,QCA 1999)
- the inclusion of 'Creative Development' as one of the Early Learning Goals for early years children (DfEE, QCA, 2000)

The work of the Qualification and Curriculum Authority[7] was the main driving force behind thinking and development attempting to both describe and promote creativity in schools. In 2000 QCA initiated a creativity curriculum project, *Creativity, Find it! Promote it!* At the heart of the QCA's findings, drawing on development and research, is a creativity framework. QCA (2005) suggest that creativity involves pupils in:

- Questioning and challenging
- Making connections, seeing relationships
- Envisaging what might be
- Exploring ideas, keeping options open
- Reflecting critically on ideas, actions, outcomes

The creative process involves: thinking or behaving imaginatively. That such imaginative activity is purposeful: directed to achieving an objective. That these processes must generate something original and the outcome of the process must be of value in relation to the objective. QCA

This approach to describing and defining creativity provides a concept that can be easily operationalised by teachers and avoids the complexity identified earlier in Richard Greene's 60 models idea.

All kinds of other policy initiatives have flowed from these major developments including:

- DfES Best Practice Research Scholarships and Professional Bursaries for teachers were funded for several years at the end of the 1990s and start of the 2000s, to encourage teachers' creativity and thinking, disseminated through Teachernet on the DFES website (DFES 2005). From 2004 the theme was continued through the Creativity Action Research Awards offered by Creative Partnerships and DfES (Creative Partnerships 2004)

[7] QCA is the schools system regulator and main R&D enterprise

- OFSTED taking a perspective on creativity through two reports published in August 03: Expecting the Unexpected (OFSTED, 2003a) and Raising Achievement through the Arts (OFSTED 2003b).
- DfES establishing the Innovation Unit as a sub-unit of the Department, with the brief to foster and nurture creative and innovative approaches to teaching and learning.
- The Arts Council and DCMS being integrally bound in to the delivery of Creative Partnerships and associated activities (Creative Partnerships 2005).
- The establishment of a creativity strand within the Department for Trade and Industry from the end of the 1990s (DTI 2005).
- National College for School Leadership developing the notion of Creative Leadership for fostering creativity in pupils (NCSL 2005).
- The introduction of the 'personalised learning' agenda (DFES 2004).

Five years after the *All Our Futures* report DfES and DCMS commissioned another review chaired by Professor Paul Roberts'. The report *Nurturing Creativity in Young People: A report to Government to inform future policy* (DCMS 2006a*)* endorsed many of the initiatives that had been spawned by the first review identifying eight areas for continuing action (p7):

Creativity in early years education – creativity embedded in early learning goals. Best practice recognition scheme and workforce development for education and creative practitioners.

Creative portfolios – personal creative portfolio (real/virtual) incorporating formal and informal learning. Established by peer review and hosted and promoted by the Creative Industries. Would provide a route into Creativity sector.

Extended schools – explicit expectations and incentives for creativity activity offered by schools outside the formal curriculum / normal school day.

Building schools for the future – Create spaces for creativity and community use

Leading creative learning – preparation of new entrants to workforce for the roles in developing creative partnerships and support crucial role of school leaders in establishing an organisational climate and framework for creativity.

Practitioner partnerships – develop brokerage arrangements and links between schools/colleges and creative industries. Provide training, accreditation and recognition for creative practitioners.

Pathways to creative industries – provide industry approved careers guidance through a website. Create 14-19 Creative and Media Diploma. Development creative industry placement schemes.

Frameworks for regulation – encourage Ofsted recognition of creativity through school self evaluation and themes in its national reviews. Build creativity into Every Child Matters Framework as an expectation on Children's Trust commissioning.

The Government's response (DCMS 2006b) was to endorse these recommendations and QCA's view of the characteristics and definition of creativity. It also established a Creative and Cultural Advisory Board to oversee the implementation of this package of initiatives.

> 'Britain will need an education system that encourages the widespread development of generic skills of creativity which include: idea generation; creative team work; opportunity sensing; pitching and auditioning; giving criticism and responding to it; mobilising people and resources round ideas to make them real. The national curriculum may support the acquisition of many of these skills. But an award or qualification more directly focused on creative skills may be needed. (James Parnell, DCMS 2006 p22)

This belief expressed by a Government minister[8] is reflected in the package of policies described above. The Government's 'will' to change society has been interpreted and driven by authoritative reviews, championed by system regulators (QCA and OFSTED), supported by R&D and programmes of professional development for teachers and leaders, promoted through the extensive dissemination of practical information and resources and brokerage to support productive partnerships

[8] James Purnell, Minister for Creative Industries quoted in (DCMS 2006a p)

with creative experts. The breadth of policies reflects the both the intent of Government and the policy makers understanding of what is necessary to bring about change in the curriculum and the thinking and practices of teachers, leaders and students.

The most recent pronouncement by Government[9] maintains this commitment. **Ten years on from the initiation of work on creativity in pre-16 education, we can see that sustained and purposeful engagement and investment has resulted in system-wide concern for the development of students' creative potential within and outwith the curriculum from Foundation (early years), through primary and secondary education.** The Government has also recognised that individuals' creativity extends beyond the curriculum and is considering how best such enterprise might be supported, recognised and valued. '

The Select Committee also made reference to the joining up of education policy with the Governments Creative Economy Strategy.

tackling the problem of creativity in UK higher education

The policies and initiatives described above show that Government and its policy making machinery, regulatory agents and enhancement brokers, have expended considerable time and resources to engage the business community and the primary and secondary education community in thinking about creativity and its useful application – innovation. We might contrast this with a different set of priorities for higher education pursued by Government during the same period last in the English higher education sector where the policy priorities have been on: 1) widening and diversifying participation 2) regulating quality and standards (through the policies and practices of the Quality Assurance Agency) and 3) building of a physical, policy and funding infrastructure to raise the status of learning and teaching in universities and colleges and enhance the quality of learning and teaching in less specific ways. Two areas where Government has invested in policy and infrastructure relating to its creativity and innovation agenda are in the fields of knowledge transfer and enterprise and entrepreneurship education.

In mainstream teaching and learning the key enhancement-focused strategies in England have been:

- Establishing a fund for the enhancement of teaching quality to support universities in building their own capacities and infrastructures.
- Establishing a network of Subject Centres to develop capacity for learning and teaching research and development within disciplinary communities – initially through the formation of the Learning and Teaching Support Network and later through the Higher Education Academy.
- Establishing accredited programmes for the initial training and professional development of higher education teachers and more recently the encouragement for institutions to develop their own Continuing Professional Development Frameworks under the accrediting powers of the Higher Education Academy.
- Funding a National Teaching Fellowship Scheme to reward excellent innovative teachers and encouraging institutions to establish their own schemes – over 120 teachers have now benefited from the scheme and a number of Fellowship projects have engaged with the issue of creativity.
- Establishing a network of 74 'Centres for Excellence in Teaching and Learning' again to reward excellence in teaching and extend the infrastructure for R&D into learning practices in higher education.

Although at first glance there does not appear to be a direct engagement with the issue of creativity in higher education, I would argue that much of this infrastructure is about supporting creative teachers and encouraging innovation in learning and teaching. More specifically,

- A number of HE Academy Subject Centres have invested in promoting creativity and the use of creative thinking techniques in disciplinary learning contexts e.g. biosciences, material sciences and construction of the built environment centres.
- A number of CETLs have been formed around creative education pedagogies and a number of others are concerned with pedagogies in which creativity is important.
- The brokerage capacity of the LTSN and HE Academy was used to initiate the work on creativity in higher education described below.

[9] Report by the House of Commons Children Schools and Families Committee (Hansard 2008)

a network for learning

> 'Because of social complexity, solving a wicked problem is fundamentally a social process…. the Holy Grail of effective collaboration – is in creating shared understanding about the problem, and shared commitment to the possible solutions. Shared understanding does not mean we necessarily agree on the problem, although that is a good thing when it happens. Shared understanding means that the stakeholders understand each other's positions well enough to have intelligent dialogue about the different interpretations of the problem, and to exercise collective intelligence about how to solve it' (Conklin 2006).

The only way to begin tackling a wicked problem is to involve people in conversation about the problem and encourage enquiry into the problem. The approach I took in 2001, when I was working for the LTSN[10], was to try to find people who cared enough about the problem to share their perspectives and experiences of solving the problem as they saw it.

This was how the **imaginative curriculum network** came into existence – a social structure for developing understanding about creativity in higher education teaching and learning. We described the problem we were trying to address as 'raising awareness of creativity in higher education'. Between 2001-2005 the network grew from 30 to over 300 people. With LTSN/HE Academy support it undertook a number of small scale research projects and surveys of practice, hosted workshops and conferences and produced many working papers and guides. Many of the products of this work are hosted on the HE Academy website and a selection of papers can be found on the discovering creativity page of my wiki – norman.jackson.pbwiki.com

teacher conceptions of creativity

If you ask any group of higher education teachers, 'what does being creative mean to you?' you will get a set of responses that embrace the following ideas:

- originality and individuality
- being imaginative, generating new ideas, thinking outside the boxes we normally inhabit, looking beyond the obvious, seeing the world in different ways
- producing new things
- doing things no one has done before
- doing things that have been done before but differently
- experimenting and taking risks

At this level there is a good degree of consensus as to what being creative means.

We all create our own meanings and understandings of creativity based on our individual experiences and values and the contexts in which we live and work. Creativity cannot be understood without an appreciation of the contexts and cultures in which it is constructed. When we contextualize abstract notions of creativity in the world of a higher education teacher, through a question like *'what does being creative mean when you design a course?'* teachers begin to give meaning to their own creativity in the contexts in which they work (McGoldrick, 2002 and Oliver, 2002):

- creativity as personal innovation – something that is new to individuals. This is often about the transfer and adaptation of ideas from one context to another;
- creativity as working at and across the boundaries of acceptability in specific contexts: it involves taking risks; creativity as designs that promote the holistic idea of 'graduateness' – the capacity to connect and do things with what has been learnt and to utilise this knowledge to learn in other situations;
- creativity as making sense out of complexity, i.e. working with multiple, often conflicting factors, pressures, interests and constraints;
- creativity as a process of narrative-making in order to present the 'real curriculum' in ways that conform to the regulatory expectations of how a curriculum should be framed

Greene (2004) is dismissive of consultants and organisations that focus solely on seeking to improve creativity by changing the environment but an important message coming through personal accounts of creativity produced by higher education teachers is the extent to which

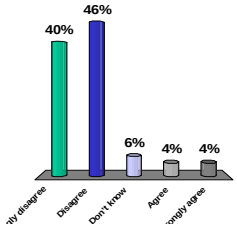
[10] Learning Teaching and Support Network – the precursor to the Higher Education Academy and a systemic broker with responsibility for facilitating collaborative professional and organisational learning and enhancing teaching practices.

individuals feel that their creativity is enabled or disabled by the organizational settings and cultures within which they work. Although teachers often fail to see the parallels with their power as enablers or frustrates of creativity when they design and teach their courses.

The good news is that most teachers do not believe that creativity is a rare gift: most (but not all) agree that it is possible, with the right opportunity for people to develop their creativity (Figure 6). These perceptions tally with Terasa Amabile's research into creativity in organisations which show that 'although some people have extreme levels of talent, everyone with normal human capacities is capable of producing creative work under the right conditions' (Amabile 2006).

Creativity is a rare gift which only a few people have

1. Strongly disagree
2. Disagree
3. Don't know
4. Agree
5. Strongly agree



It is possible for most people to develop their creativity if they are given the opportunity to do so

1. Strongly disagree
2. Disagree
3. Don't know
4. Agree
5. Strongly agree

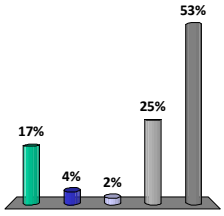


Figure 6 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

Jackson and Shaw (2006) reveal that academics associate a number of features with creativity regardless of disciplinary, pedagogic or problem working context. For example

Being imaginative – generating new ideas, thinking out of the boxes we normally inhabit, looking beyond the obvious, seeing the world in different ways so that it can be explored and understood better.

Being original. This embodies:

- the *quality of newness* for example: *inventing* and producing new things or doing things no one has done before;
- being *inventive with someone else's ideas* – recreation, reconstruction, re-contextualization, redefinition, adapting things that have been done before, doing things that have been done before but differently;
- and, *the idea of significance and value* – there are different levels and notions of significance and utility and value are integral to the idea.

Being curious with an enquiring disposition – willing to explore, experiment and take risks i.e. the attitude and motivation to engage in exploration and the ability to search purposefully in appropriate ways in order to find and discover. It is necessary to work in an uncertain world and often requires people to move from the known to the unknown.

Being resourceful – using your knowledge, capability, relationships, powers to persuade and influence, and physical resources to overcome whatever challenge or problems are encountered and to exploit opportunities as they arise.

Being able to combine, connect, synthesise complex and incomplete data/situations/ideas/ contexts in order to see the world freshly/differently to understand it better.

Being able to think critically and analytically in order to distinguish useful ideas from those that are not so useful and make good decisions. Being able to take value from feedback and use it constructively to improve ideas,

Being able to represent ideas and communicate them to others – the capacity to create and tell stories, pitch and sell ideas, empathize with others and show people possibilities, opportunities and solutions in ways that make sense to them and capture their imagination.

Over and over again I have tested these propositions in many disciplinary and mixed audiences and they generally seem to be accepted with few reservations (Figure 8). You will notice that there is good correspondence between the collective views of academics and the definition of creativity used in schools education developed by QCA (bold text page 10).

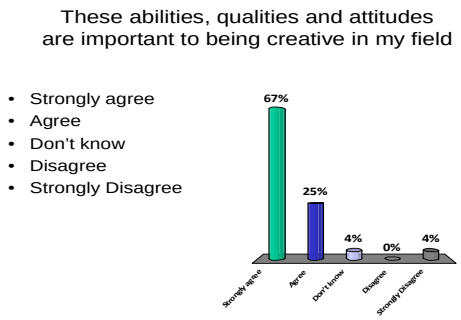


Figure 8 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

disciplinary views on creativity

> 'creativity results from the interaction of a system composed of three elements: a culture that contains symbolic rules, a person who brings novelty into the symbolic domain, and a field of experts who recognise and validate innovation. All three are necessary for a creative idea, product or discovery to take place' (Csikszentmihalyi 1997 p6).

Creativity is a social and cultural phenomenon and we need to understand how it is understood in the different cultural domains (disciplines) and the field (teachers and others who practice in the discipline). We are fortunate in the UK in having a set of over 50 'Subject Benchmark' statements[11] that have been constructed by members of different discipline communities to make explicit the nature of the learning that might be expected from undergraduate study in the discipline. A sample of 19 statements was analysed in 2005 using a simple tool containing 18 indicators of creativity, as part of the imaginative curriculum project.

The analysis (Table 1) shows that most of the statements contain less than half the possible indicators and 11 statements addressed no more than a third of the possible indicators. Overall these statements were impoverished in expressions of creativity. Jackson and Shaw (2006 p94) drew the following conclusions.

- Students' creative thinking abilities are generally not addressed by subjects except for some acknowledgement of the need to operate in complex and ambiguous settings.
- Students' idea generating capacities are least well covered, with only a small number of subjects registering any indicator.
- Student imagination and originality is poorly recognised, with the exception of systematic processes of research and enquiry, which is well covered.
- The greatest attention is given to activities that have the potential for nurturing students' creativity.

Table 1 Indicators of creativity in 19 Subject Benchmarking statements (Jackson and Shaw 2006). The tool contained 18 possible indicators.

A&D	13	EES	7	Hist	6
Engin	9	Med	7	LRS	6
SocW	9	Bios	6	Math	5
Arch	8	B&M	6	Tour	4
DDP	8	Chem	6	Geog	4
Nurs	8	Eng	6	Ed	4
				Acc	3

It would seem that disciplinary communities don't care about creativity very much, at least in public! WE did not believe this so a second study was undertaken involving questionnaire-based surveys of higher education teachers in the disciplinary fields of Engineering, Earth Science, History, Medicine, Social Work and Modern Languages. These surveys told quite a different story[12]. Far from being neglected academics see creativity as something that is very important to their thinking, practice and identity. However, contributors to the surveys also believed that creativity was not really valued in the discipline beyond the rhetorical level. The main conclusions from the survey work are outlined below.

***Sites for creativity* -** sites for creative thinking and action appear to be available in most aspects of disciplinary practice. Sites for

[11] http://www.qaa.ac.uk

[12] Working papers can be found at norman.jackson.pbwiki.com/

creativity can be connected through the idea of disciplinary enquiry and problem working.

Being original **–** is understood as creating something new and useful to the discipline. For most academics this is embodied in the products of research. The idea is connected to invention and innovation. In history this could mean: new approaches to historical problems; new techniques to gather and analyse data; new approaches to validate evidence; new interpretations of evidence; new forms of history and new forms of communicating historical information.

Making use of imagination – is focused on the use of mental models in disciplinary thinking. It is a source of inspiration, stimulates curiosity and sustains motivation. It generates ideas for creative solutions and facilitates interpretation in situations which cannot be understood by facts or observations alone. Disciplinary problems and concerns provide an essential context for the use of imagination.

Finding and thinking about complex problems – the engine of academic creativity is intellectual curiosity – the desire to find out, understand, explain, prove or disprove something. Curiosity leads academics to find questions that are worth answering and problems that are worth solving.

Making sense of complexity – academics believe that creativity is something that is used in working with problems that are challenging, new, unpredictable and/or emergent. Imagination is essential for the construction of mental models or representations of reality that people use to understand complex phenomena. Sense-making often involves

Synthesis, making connections and seeing relationships – Because working with complex problems (systems) often involves working with multiple and incomplete data sets, the capacity to synthesise, make connections and see new patterns and relationships is important in sense-making (interpreting) and working towards better understandings and possible solutions to difficult problems.

Communication - the communication of ideas, knowledge and deeper understandings are important dimensions of creativity in the discipline.

> 'I would claim that the communication of science is a feat comparable to the ability of humans to transmit aesthetics through painting or music..'
> Earth Scientist

The social worker cannot begin to understand and resolve a clients problems if she cannot communicate in ways that are meaningful and empathise with her client.

Story telling is an important dimension of communication. Disciplinary cultures are largely based on writing using the conceptual and symbolic language and images that have been developed to communicate complex information. Story-telling and story-writing are important sites for academics' creativity.

Resourcefulness – in the professional disciplines many roles involve solving difficult problems requiring ingenuity and resourcefulness. For example, a social worker or medic might need all their resourcefulness to access and acquire the resources to solve a client or patient's problem.

creating better conditions

We all have a choice to behave creatively or not and teachers have the choice to teach in ways that are more likely to engage students creatively, or not.

Teachers recognise that they are responsible for creating the conditions which can either encourage or discourage students from being creative. Alltree et al (2004) identified several conditions that appear to facilitate students' creativity:

- having sufficient time and space in the curriculum to allow students to develop their own creativity
- having sufficiently varied and diverse working situations to enable all students to be creative
- allowing students the freedom to work in new and interesting ways
- challenging students with real, demanding and exciting work
- designing assessment which allows for outcomes which are not narrowly predetermined

- fostering a climate within a module, programme or department which encourages experimentation, risk taking, observation/awareness, evaluation and personal development for both staff and students
- continuing academic debate within the discipline, and dialogue with the various stakeholders, about the nature of the subject and the role of creativity within it

teaching for creativity

The concept of teaching is critical to any consideration of the promotion of students' creativity. Negative views of the idea that creativity can be taught are based on transmission models of teaching where teachers attempt to transfer their own knowledge and sense-making to students through lecture-dominated teaching, where students' engagements in learning are predominantly based on information transfer and are heavily prescribed and controlled by the teacher, and where summative assessment drives the learning process. Such conditions are less likely to foster students' creativity than when a teacher acts as a stimulator, facilitator, resource-provider, guide or coach, and where students are given the space and freedom to make decisions about their own learning process and outcomes.

An analysis of twenty-eight accounts of teaching that was deliberately trying to encourage students to be creative in a range of disciplinary contexts (Jackson, 2004) revealed the things that higher-education teachers do to promote students' creativity. They:

- give students permission to be creative
- encourage them and value their efforts to be creative
- provide time for students to be creative
- provide safe spaces where they can try new things out
- give students the confidence to take risks
- develop students' self-confidence to work in unpredictable situations
- promote the development of self-awareness and reflective learning
- provide situations for learning where there are no right answers
- provide real-world learning situations
- provide activities that are meaningful to participants
- provide learning situations that are both fun and challenging
- demonstrate their own creativity : provide a role model
- are prepared to take risks themselves
- are prepared to reveal something of themselves in the teaching process
- act as guides and facilitators
- adopt a questioning approach to learning
- create opportunities for problem- or enquiry-based approaches to learning
- provide opportunities for collaborative working and discussion
- are sensitive to the balance between challenge and reinforcement
- are sensitive to the balance between freedom and control
- are responsive to students as a group and as individuals and adapt their teaching as new possibilities emerge

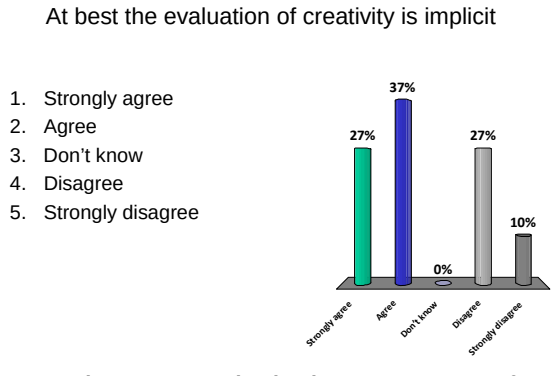
To summarise, teaching for creativity requires a pedagogic stance that is facilitative, enabling, responsive, open to possibilities, and collaborative, and which values process as much as outcomes. Teachers operate in strong cultural and procedural environments that have significant impact on what they can do as teachers to promote students' creativity. In spite of, or perhaps because of, these constraints, teachers who care about creativity are able to overcome these barriers to create, through their pedagogy, curricular spaces and opportunities for learning that encourage and reward students for their creativity.

assessing for creativity

Of all the aspects of creativity the one that poses the greatest challenge to teachers is how to assess / evaluate it (Jackson 2005). Creativity is contested and it is perhaps most contested in the area of assessment. While many teachers believe that it is possible to help students use their creative abilities to better effect, far fewer think it is possible to assess these capabilities reliably and even fewer are prepared to try and do it. Yet evaluation is critical to the very idea of creativity.

The views of higher education teachers on whether creativity can be assessed fall into four camps. Some teachers believe that students' creativity is evaluated through explicit assessment criteria. Others believe that insufficient attention is given to recognising

students' creativity and that at best the evaluation and recognition is implicit.



Ulster Creativity Conference April 2008).

The third group believe that is not possible and or desirable to assess creativity. While teachers in the fourth group value creativity but don't know how to assess it. Looking at this optimistically I interpret this to mean that, most teachers with appropriate support, guidance and cultural encouragement could and would assess creativity in students' higher education learning.

But a majority of teachers also believe that assessment is a major inhibitor of students' creativity.

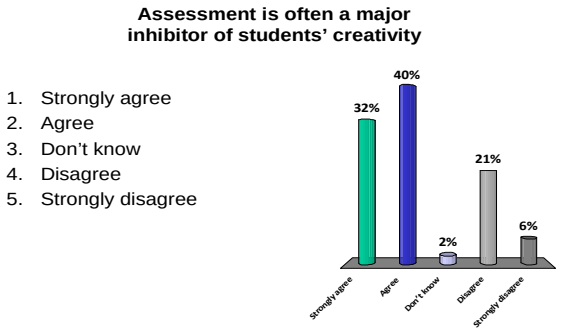


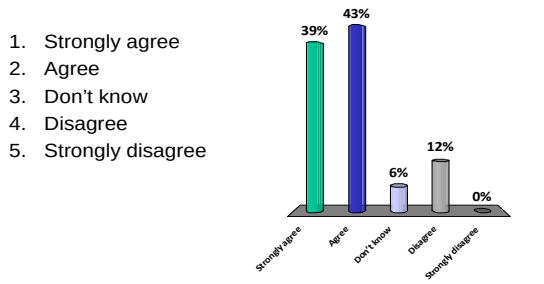
Figure 10 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).

Outcomes based assessment that assumes that all learning can be predicted and that the teacher is the only person who can define what the outcomes should be, is antithetic to learning that emerges in unpredictable ways – such as is produced through creative processes that pursue a sense of direction rather than a preordained pattern and specific criteria. This barrier can only be overcome if learners become partners in the assessment process.

The metaphor of *catching the light* through a reflective process might be appropriate for catching creativity which requires people to be conscious of their own means of engaging with complex learning to produce novel products or other outcomes.

Emerging from the imaginative curriculum enquiry and endorsed on numerous occasions by groups of teachers was a view that the primary role of the teacher is not to define creativity for students and assess them against their criteria. Rather, it is to help students recognise and understand their own creativity and help them express it and make claims against the evidence they feel is appropriate.

Figure 11 Typical pattern of beliefs in a group of higher education professionals (58 people at the University of Ulster Creativity Conference April 2008).



what sort of practice would give meaning to this role?

Borrowing from practice in the architects studio, John Cowan describes a collaborative teaching and learning scenario in which the development of understanding of creativity, the criteria through which it might be evaluated, and the process of claim and judgement making, is grown by all participants through the learning processes.

Working backwards, the results of creative thinking and action is embodied in a self-peer and teacher assessed portfolio – with heavy emphasis on self-assessment. The portfolio contains the following elements (Cowan 2006 p161):

- a definition of what the learner means by creativity
- a clear statement of the achievement and/or development in creative ability to which the learner aspired and an indication of the standards and levels against which the learner has decided to judge that creativity
- an indication of the sources from which the learner has drawn information from which to assemble their judgement of their performance and development: information about the products and results of being creative
- the making of the judgement and the reasoning behind it
- the judgement itself in qualitative terms, perhaps under various headings.

The learner presents the self-assessed portfolio for audit by the teacher who will scrutinise the rigour of the self-assessment rather than making their own judgements on creativity. The teacher's role is to decide whether they are persuaded to endorse the learner's claims and judgements of their own creativity against the criteria they themselves have elaborated. The primary purpose of this strategy is to enable and encourage the learner to explore, experience and develop their own understanding of creativity and to construct new meanings in the context of the task, their programme and their disciplinary field of study. It is about helping learners appreciate their personal creativity in the context of their disciplinary field and provide them with experience of being judges of creativity in their disciplinary cultural field.

John Cowan underpins this evaluative process with a collaborative learning process involving:

- Induction to the process and the problem/task within which creative enterprise will be evaluated.
- Initial group discussions about creativity in the disciplinary/professional leading to initial definitions of the meanings of creativity.
- Facilitation of thinking about standards and targets, and drafting of initial standards by each student.
- Learner engagement in the task mindful of the learning objective of evaluating own creativity: learners would maintain a reflective journal focused on the creative process but framed around unanswered questions that were pertinent to the task in hand and for which the learner feels that even a partial answer would help them progress. Exemplars of completed journals would be offered to show what was expected.
- Participation of learners and teacher in regularly in group "crits", as practiced in architecture and the creative arts. In these sessions, learners critically appraise a piece of their work in progress, after which peers and tutors will offer comment, with an emphasis on reasoned and constructive judgements of that work.
- As learners engage more deeply in their task their understandings about what creativity means will change. Learners are encouraged to make any changes they wish to their initial definitions of creativity and the criteria and standards they developed.
- Learners assemble their portfolio and self-evaluations as they are working on problem their task. The final version of the portfolio contains the elements of self-assessment detailed above.

can PDP help learners become more aware of their own creative practice?

Personal Development Planning (PDP) is an important policy that might be utilised in promoting more creativity in higher education (Jackson 2006b).

PDP is a process that is being introduced in UK higher education to encourage students to plan for, manage and reflect on their own learning and development. It treats the student experience holistically ie it addresses the academic, career and personal dimensions of student development. PDP promotes approaches to learning that involve and connect *planning* (specific goals for learning and strategies for achieving desired goals), *doing* (aligning actions to learning goals but being open to change if necessary), *observing and recording* (reporting on the process and outcomes of learning) and *reflecting* (reviewing and evaluating actions, results and the effects of both).

All these domains of activity provide potential sites within which an individual's creativity might be utilised, recognised and further developed. In simple terms PDP can support creative enterprise in four main ways.

Firstly, the strategic process that underlies PDP can be used to help learners articulate what they understand creativity to mean in the contexts in which they are using it. In a challenging problem working context a learners decision to be creative and their initial conceptions of what creativity might mean can be made explicit within the forethought stage of the process which provides a reference point for subsequent reflections on creative action and the outcomes of action.

Secondly, PDP can provide a vehicle for helping students to think about their problems in creative as well as analytical ways. By developing students' creative thinking abilities we can expand their capacities for engaging with complex problems and difficult situations and perhaps their capacity to work with others to explore and understand a complex problem.

Thirdly, the process can encourage learners to be more aware of their own creative processes and actions as they are engaged in activities in which creativity plays a part. Encouraging students to observe themselves, record their evaluations and reflect on the effects of actions in real time will create an evidence base to support an individual's claims for creativity. Such explicit knowledge provides the raw materials for engaging tutors and peers in conversations about the nature of creativity and the products that emerge from such processes.

Finally, encouragement to reflect on the whole experience provides opportunities for developing a deeper overall understanding of the nature of an individual's creative process and how an individual has used their different abilities to tackle a problem. It provides a framework and context for developing the sorts of personalised models of creativity that Greene has developed (Appendix 1).

Tools to help learners think about the way they use their creativity are an essential part of the PDP infrastructure. For example a Learning through Experience Award framework developed at the University of Surrey contains within it specific prompts to direct learners' attention to their own creativity and how it features in work, learning or play. The models of creativity developed by Greene (2006) Appendix 1 with appropriate guidance, could also be used for this purpose.

developing generative thinking skills

So far we have focused on thinking skills that are reflective and evaluative. The promotion of creativity also requires us to pay attention to generative thinking that enables us individually or collectively to harness our imaginations more productively. Such techniques are not, in general specifically addressed, in higher education learning experiences, but they are techniques that are used in many business/industry problem working situations. There are many such techniques and we have used successfully a combination of techniques that encourage divergent and convergent thinking with students and staff. A good example of the promotion of these techniques in a disciplinary context (biosciences) can be found http://www.fbs.leeds.ac.uk/creativity

designs for emergence

Creating more opportunity for learners to be creative in higher education is partly a matter of design (there are certain things we can do as teachers and institutions to encourage creativity) and partly a matter of permitting, encouraging and working with emergence (if we let go and let learners follow their passions then creativity is more likely to emerge in ways that cannot be anticipated). You might say that we should be designing for emergent as well as for more predictable learning. The sad thing is that the outcomes model we are using in higher education results in designs that provide little affordance for emergence. So perhaps part of the answer to our problem is to learn how to design for emergence.

curriculum for creativity

To encourage and value the diversity of learners' creativity I believe we need to look beyond the academic curriculum and be mindful of Teresa Amabile's criticisms.

> 'We hardly ever pay attention to intrinsic motivation, which is the driving force that actually makes creativity happen..... It's absolutely crucial to set up a work environment that supports intrinsic motivation and supports people developing their talents. It should be an environment that's going to give people a good degree of autonomy' (Amabile 2006).

The higher education curriculum is an environment that seeks compliance and conformity and the amount of autonomy for self-expression is often severely restricted by the norms of self-expression accepted in the academic forms of the discipline. So we have to think more expansively than the traditional academic curriculum if we are to nurture learners' creativity.

Paul Roberts has the right idea when he says of the schools (pre-16) curriculum:

> ‘It is not just that much of what children do through extra-curricular activities at school goes unacknowledged. School system qualifications take little or no account of what children may have done outside school, in their own time’ (Roberts 2006:21).

The idea of a life-wide curriculum is proposed as a concept for a higher education curriculum that maximises opportunity for embracing the most inclusive concept of learning: a concept that explicitly recognises and values creativity. This visualisation of multiple contexts for being creative is important if we accept Greene’s multiple personalised models of creativity (Appendix 1). Surely, the personalisation and growth of models of creativity that are meaningful to individuals require people to grow such models in a range of settings and situations that inspire them.

I argue that a life-wide curriculum would support creativity in three different ways.

1) In the forms that are necessary to be successful and innovative in the academic disciplinary or interdisciplinary domain. This includes disciplines that are traditionally considered to be creative (eg linked to Creative Arts or Design) and those that are not considered to have a creative basis.
2) In the forms that are necessary to be successful and innovative in any professional/work domain. This includes work enterprises that are traditionally considered to be creative (eg linked to Creative Arts or Design) and those that are not considered to have a creative basis.
3) In the forms of self-expression that learners chose for themselves in their lives outside the performative academic and practice curriculum. This domain is particularly rich in affordances and possibility spaces and it is this domain that is most difficult to honour and recognise learning and creative enterprise.

All three domains contain different forms of and contexts for social practice, all can potentially involve students in being creative and learning to be creative and all require participants to be engaged in evaluating and making judgements about creativity.

life-wide curriculum framework

We might visualise a life-wide curriculum as having a number of distinctive components. (Figure 12). These are offered as a starting point to stimulate discussion.

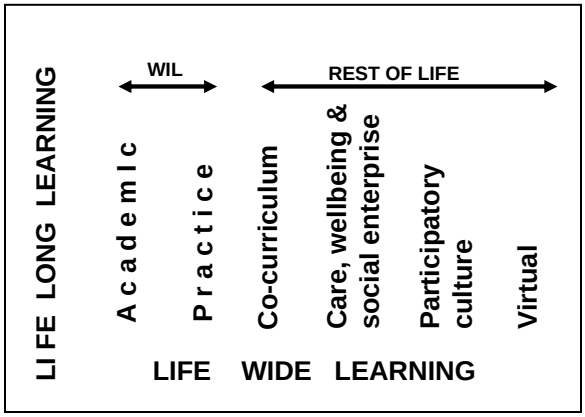


Figure 12 Some of the diverse environments in a life-wide curriculum where creativity can be found.

1 The academic curriculum – is focused on learning about a subject with heavy reliance on explicit knowledge mediated by professional teachers who embody an epistemology of practice that is appropriate to ‘being an academic’ and ‘being an academic in a particular disciplinary field’. Experiences in the academic curriculum tend towards mastering theory-rich knowledge through transmission, self-study and sometimes small group study. The emphasis in teaching is on instruction – the transmission of existing explicit knowledge mediated by the teacher. Creative self-expression is heavily constrained by the norms of the academic discipline but as we have seen above creativity is valued in disciplines and the emphasis here should be on facilitating discussion within discipline communities to reveal the forms of creativity that are valued and the sites where creativity is important. A more process-oriented academic curriculum that promotes productive enquiry and problem-based learning, moves away from a knowledge transmission model towards a facilitated discovery model of learning that is much more in tune with the idea of learning to be creative. An academic curriculum that is formed around the idea of productive enquiry also connects and integrates more naturally with the practice curriculum. Within the academic curriculum wee may also utilise pedagogies that reveal the nature of creativity in a problem working context,

such as the approach developed by John Cowan described above. We might also usefully incorporate creative thinking techniques used by designers to generate and evaluate ideas in their problem working and solution finding processes.

2 The practical or practice-based curriculum – here the emphasis in learning experiences is on applying the knowledge learnt in self-study and mastering the ways of finding out and applying knowledge in the disciplinary field. This is primarily where students learn how to be (although they also need knowledge derived from the academic curriculum to learn to be). The practical curriculum may be oriented towards the academic application of knowledge or towards real world application. At its best the practice-curriculum moves out of the classroom into the professional practice environment and provides learners with opportunities of learning to be through performing professional actions in a real world work environment alongside other practitioners. Learning by doing in real world contexts and observing people who are already expert and tapping into their tacit knowledge, is the best way to learn what being creative means in a specific work-based environment. Here the role of the professional educator is to a) prepare learners for their experience b) to provide support through tools and strategies that will enable them to think deeply and systematically about their experience draw maximum benefit from it c) to value their self-evaluations of their creative enterprise in their reviews and evaluations of learners' performance in the work environment.

The practice curriculum enables learners to learn and be inducted into an epistemology of practice(s) in the social, professional and working worlds that they will enter when they leave the academic environment. The epistemology of (professional) work practice (coming to know what to do through doing in a specific situation or context drawing on past experiences which includes learned theory) can only be learned through the experience of practising with other practitioners. The epistemology of practice pays particular attention to the idea of Legitimate Peripheral Participation (Lave and Wenger, 1991). It is situations of social practice that learners come to know what it means to be creative in the situated cultures of practice.

Raelin (2007) identifies the building blocks of an epistemology of practice as:

Extensive use of tacit knowledge – the tacit processes that practitioners use as they work through the problems and challenges of daily practice. Such knowledge is deeply rooted in action and involvement in a specific context in a specific time. But while people may be knowledgeable about what they do and can do it, they may not be able to explain how they know what to do.

Critical reflection – the thinking capacity to make sense of their own practice and experiences and mindful habit of doing it. Or the ability to think about how their actions resulted in a particular outcome. This ability results in the creation of a personal 'real time' learning environment through which beliefs, assumptions and mental models as well as actions, can be tested and evaluated.

Mastery – people develop their expertise not only by repeated practice in a single domain but by acquiring skills in multiple contexts. Mastery is developed through an appropriate apprenticeship in which novice practitioners are exposed to embodied practice, apply and develop their own practice, are encouraged and given feedback on their performance and gradually take on more and more responsibility. Developing mastery is coupled to the development of tacit knowledge and knowing, and the ability to evaluate and learn from own experiences through critical reflection.

Michael Eraut's (2007 and 2008) more pragmatic visualisation of an epistemology of professional practice (based on empirical evidence of how professionals actually work), complements Railin's conceptions. He notes that the basic epistemology of practice involves the professional actions of:

Assessing situations (sometimes briefly, sometimes involving a long process of *investigation and enquiry*) and continuing to monitor the situation;
Deciding what, if any, action to take, both immediately and over a longer period (either on one's own or as a leader or member of a team);
Pursuing an agreed course of action, performing professional actions - modifying, consulting, evaluating and reassessing as and when necessary;
Metacognitive monitoring of oneself, people needing attention and the general progress of the case, problem, project or situation; and sometimes also learning through reflection on the experience.

His empirical observations of how people learn in workplace settings, either as explicit learning activity or a by-product of work, provides the basis for new and useful tools to help learners in work situations to observe themselves and others, and think about what they are doing and the effects of what they are doing more wisely. There is much we can do here to sensitise work placement learners to what being creative means.
3 The co-curriculum – relatively little attention is given in the UK to the idea of a co- (complementary) curriculum which is not part of the formal academic or practice curriculum. Such experiences provide opportunities to enhance learning and personal or professional development beyond the academic programme. An excellent example of a co-curriculum programme in the UK is the York Award offered by the University of York. Over 30 workshop sessions are offered in the scheme many of which are focused on the development of business, enterprise and creativity skills. Beyond the short courses there is great potential for the development of more extended process-based learning within which there are opportunities for self-expression and the development of creative identity. Good examples can be found at the University of Surrey which offers a Cultural Academy and an Enterprise Academy. A distinctive feature of co-curricular learning enterprises is their potential for incorporating diversity (learners from all levels, all disciplines, all cultural backgrounds) into the experience and for learners themselves to take a more direct role in shaping, co-creating and facilitating the experience. Such opportunities provide serious opportunity for creativity and self-expression. The role of the professional educator here is to ensure that learners are aware of these things and that self-evaluation processes designed into the experience draw attention to these forms of learning and outcomes.

rest of life

We don't normally consider this in higher education yet it is normally the largest and often the most creative part of a learners life. It is rich in experiences that involve complex relationships and social interactions with family and friends, sustained activities that are grown from need – like having to earn an income to support study, activities that are pursued for their intrinsic interests and challenges – like sport, hobbies, membership of societies, drama groups, spiritual – either practising a religion or secular spirituality – day to day activities and routines that are just about living and unexpected challenges that can immerse you in an experience that will change you forever.

All these things need to be incorporated into a busy life: space needs to be found and lives have to be organised to enable things to happen while retaining the ability to improvise when faced with the unexpected. Wellbeing in the face of such complexity stems from the never-ending meaning-making narrative a person constructs to make sense of her actions and life.
Some events are richer in new experience than others (travel may put a learner into a culture very different to their own, or the serious illness

or loss of a close friend or relative may push people into emotional spaces that have never been encountered before) and stand out as significant events in a learners life. There is much informal and complex learning embedded in many of these things that we take for granted but which could be focused on and revealed if a learner chose to do so and a university had the means to support such revelations.

This is the real world of complexity and the juggling and balancing of commitments, relationships, interests, challenges and the totally unexpected is learning for the rest of life. Ultimately, it is the totality of the lived experience that provides young independent people with their first experience coping with complexity and of having to think with sufficient complexity to survive, maintain and develop a sense of wellbeing. I believe it is in this rich matrix of interconnected experience that the source of some of human creativity resides. In neurological terms, a life lived to the full contains the cognitive, emotional and physical experiences that enhance brain development (forge dense interconnected neuron networks) that facilitate subsequently associative thinking from which some of our ingenuity flows – particularly that required in social contexts.

creativity and a life-wide curriculum

A life-wide curriculum honours informal/accidental/by-product learning in learner determined situations as well as formal learning in teacher determined situations. It embraces learning in the physical/emotional social spaces that characterise the work/practice environment and it honours formal and informal learning in all other environments that learners chose to be in because of their interests passions and needs. Because of this a life-wide curriculum is likely to provide a better framework for encouraging, supporting, recognising and valuing learners' creativity and self-expression, than a curriculum that is solely based on academic or academic and professional practice experiences.

Taken together the different parts of a learners life provide huge opportunity for creativity and self-expression around the things that learners are passionate about and interested in. By honouring and recognising learning in this part of a learners life we are tapping into the intrinsic motivations for learning and mastering something that are so often missing in an outcomes-based highly assessed higher education experience. A university that is serious about promoting learners' creativity and creative enterprise will develop the cultures, capacities and systems to support learning and from this domain. Here are just a few of the possible sites that might be included in a life-wide curriculum.

4 *The care, wellbeing and social enterprise curriculum* – this term is being used to cover the various services and sponsored enterprises within a university that look after and promote wellbeing and enable students to contribute to the wellbeing of others. It also embraces the volunteering activities of learners outside the university. Some of these enterprises may be designed into students' experiences for example induction processes or peer mentoring in student residences, other enterprises might form part of the co-curricular experiences of students (for example specific events), other enterprises might be available when they are needed – for example health and counselling services or financial and other advice services. All are necessary and when they are needed they often enable learners to learn how to deal with difficult personal situations. They are as important as any other component of the life-wide curriculum. Learners give service to others primarily because they are intrinsically motivated to do so. It is this intrinsic motivation that we are seeking to embrace in our concept of a life-wide curriculum. Voluntary service is likely to trigger very different forms of emotional engagement and creativity within work-learning enterprises. Higher education needs to have the means to recognise and values these forms of creativity and self-expression for those learners who

would like to include this in their personal experience-based profile of learning.

5 Creative prosumers

From a creative and cultural engagement standpoint there is a world out there that many people access to both produce and consume contemporary products of creativity. Henry James has termed this a 'participatory culture' and the notes below are taken from a paper by Henry Jenkins and others (2007:3)

> ' a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (at the least they care what other people think about what they have created). Forms of participatory culture include:

Affiliations — memberships, formal and informal, in online communities centered around various forms of media, such as Bebo, Friendster, Facebook, message boards, metagaming, game clans, or MySpace).
Expressions — producing new creative forms, such as digital sampling, skinning and modding, fan videomaking, fan fiction writing, zines, mash-ups).
Collaborative Problem-solving — working together in teams, formal and informal, to complete tasks and develop new knowledge (such as through *Wikipedia*, alternative reality gaming, spoiling).
Circulations — Shaping the flow of media (such as podcasting, blogging).

Participatory culture shifts the focus of literacy from one of individual expression to community involvement. The new literacies almost all involve social skills developed through collaboration and networking. These skills build on the foundation of traditional literacy, research skills, technical skills, and critical analysis skills taught in the classroom.

The new skills include:
Play — the capacity to experiment with one's surroundings as a form of problem-solving
Performance — the ability to adopt alternative identities for the purpose of improvisation and discovery
Simulation — the ability to interpret and construct dynamic models of real-world processes
Appropriation — the ability to meaningfully sample and remix media content
Multitasking — the ability to scan one's environment and shift focus as needed to salient details.
Distributed Cognition — the ability to interact meaningfully with tools that expand mental capacities
Collective Intelligence — the ability to pool knowledge and compare notes with others toward a common goal
Judgment — the ability to evaluate the reliability and credibility of different information sources
Transmedia Navigation — the ability to follow the flow of stories and information across multiple modalities
Networking — the ability to search for, synthesize, and disseminate information
Negotiation — the ability to travel across diverse communities, discerning and respecting

multiple perspectives, and grasping and following alternative norms.

Active participation in such communities and the production, consumption of content and evaluation of content clearly adds another rich dimension to the life-wide learning idea. Embedded in such activities are passions and intrinsic motivations, technical skills, dispositions, identities and creativity that could be recognised by universities if they have the means and will to do so.

6 Virtual worlds – overlapping the internet-based world of prosumers are virtual worlds such as Second Life, Croquet and World of Warcraft. These are avatar-based, social spaces enabled by the internet that provide players/participants with opportunity to engage in interactions, relationship and identity building and coordinated collaborative action. These notes are taken from the excellent working paper by Douglas Thomas and John Seeley Brown (2007). The visual component of virtual worlds shifts the focus of learning from text-based interaction to more complex 3D visual-sound-movement medium which gives participants a sense of place, space and physical/emotional embodiment. From a creativity perspective they invite the use of imagination in ways that allow users to step into a world where they can adopt a different persona while bringing with them many real world dispositions and beliefs. Virtual worlds are environments in which people who are expert learners in the real world begin as complete novices with no knowledge, skill or understanding drawn from past experience of the world they are in. They demand high levels of engagement (immersion) to achieve mastery and once this level has been achieved participants can bring about cultural change. Virtual worlds require participants to think about knowing or knowledge for action.

You have only to read the numerous articles produced by John Seeley Brown to appreciate that these worlds afford huge opportunities for complex skill development, creativity and self-expression. The implication for universities is that we need to acknowledge that this world is a reality for at least some of our learners. We need to recognise the potential of these environments for new forms of learning and experience and we need to invest in building our knowledge and understanding of them. These are environments where learners can lead professional educators and we should not be afraid to let them. Higher education needs to have the means to recognise and values these forms of creativity and self-expression for those learners who would like to include this in their personal experience-based profile of learning: representations of learning that are likely to reflect the virtual world in which they formed. this in their personal experience-based profile of learning.

7 Immersive experiences – 'immersion' is not confined to a particular context and any of the contexts described above could provide an environment for immersive experience. Immersion is a metaphor to describe a state of being which can have both negative consequences – being overwhelmed, engulfed, submerged or stretched, and positive consequences – being deeply absorbed or engaged in a situation or problem that results in mastery of a complex and demanding situation. *Being immersed in* an extremely challenging experience might be very uncomfortable but it is particularly favourable for the development of insights, confidence and capabilities for learning to live and work with complexity and messyness. It is in these situations that we need to draw on both our intellectual and our creative resourcefulness. A life-wide curriculum offers much more opportunity for recognizing immersive experiences than a more traditional curriculum. This wiki contains some useful explorations of the idea and a number of working papers.
http://immersiveexperience.pbwiki.com/

Other possibility spaces afforded by 'rest of life'

I have just given several examples of rich experiential environments in which learners can engage in social interaction, creative enterprise

and immersive forms of engagement. There are however many other potential sites for learning and creative enterprise for example, through participation in creative arts activities like drama groups, music making, creating and running a business, serious travel to other cultures. All could be included in a life-wide curriculum whose purpose was to encourage, value and recognise individual and collective creativity and creative enterprise.

curriculum designs for creativity

Turning now to the formal part of the higher education curriculum, I agree with Peter Knight who says that any programme can be designed or redesigned to make it more favourable to nurturing creativity and developing the habits of thinking creatively (Knight 2002). The following points (adapted and developed from Knight 2002 and Jackson 2002b) provide some guiding principles for helping teachers to develop their capacity to encourage students to learn more creatively and to design a curriculum that nurtures creativity:

Teacher conceptions of teaching and learning. We are enabled or stopped from doing things by our imaginations. Conceptions that support creativity in students' learning view teaching itself as a learning process and the role of the teacher as actively engaging students in challenging learning processes and helping them create their own processes and frameworks for working with 'problems'. Teaching strategies foster students' intrinsic motivations for learning that derive more from the pleasure of interesting challenges than from the threat of assessment. Teacher conceptions must also value the idea that we can learn through systematic reflection in order to optimise the potential for learning from any situation – even those that don't go the way they are expected to. John Biggs identifies three levels of thinking about teaching in terms of what is focused upon (Biggs 1999, chapter 4). At level 1 the focus is on *what the student is*; at level 2 the focus is on *what the teacher does*; and at level three the focus is on *what the student does*. Teachers who are likely to be most sympathetic to fostering creativity in students' learning are likely to be thinking in ways that are consistent with the second and third levels – what do I need to do to promote this type of learning and what do students need to do to learn this way? Houghton (2002) added a fourth level called '*how the student manages what the student does',* initially within frameworks created by the teacher, but ultimately negotiating or creating his/her own framework. This conception supports habits of self-regulated learning (Zimmerman, 2000) and improved self-awareness of *what it means to be* a historian, chemist or engineer. An expanded commitment to nurturing creativity will only occur if teacher perceptions of teaching and learning embrace these higher-order and increasingly sophisticated conceptions.

Sharing understandings and conceptions. Designing a curriculum to support creativity in students' learning works best when teaching teams develop a shared understanding of the different meanings of creativity for the particular learning contexts. In reaching such an understanding it is helpful to examine what teachers understand by creativity. Subject benchmarking statements rarely mention creativity so there is plenty of scope for discussion within disciplinary communities.

Developing the knowledge and skills of teachers. Helping students to be creative requires particular facilitation skills and the adoption of a collaborative pedagogic model. Building the knowledge and capacity for this type of teaching is an essential step in the development process. Helping teachers and those who develop teaching to be more knowledgeable about the ways in which creativity in student learning can be nurtured is the central concern of the Imaginative Curriculum project.

Mapping what already exists. Most programmes will contain within them opportunities for students to work in creative ways. Making these opportunities explicit and understanding the nature of the creative processes within these opportunities is a necessary first step in designing for creativity. When the mapping is completed additional ways and strategies in which creativity might be fostered can be considered (see below).

Progression to independence. Nurturing creativity requires teachers to respect the goals, motivations for learning and decision-making processes of learners. This way of thinking is consistent with the idea of enabling learners to become autonomous and self-regulating. A well-designed curriculum will prepare students for learning creatively, equip them with a range of

tools and encourage them to use and adapt these tools and work towards independence. Zimmerman's (2000) notion of self-regulated learning provides a good theoretical model on which to develop teacher conceptions and practice.

Openness to choice and negotiation. Teachers introduce the tools – concepts, strategies, information sources – and then have students practise them on problems and situations that they choose/identify. This requires teachers to be flexible and adaptable in their approach and to facilitate students' decision-making. These characteristics of learning are also consistent with Zimmerman's model for self-regulated learning.

Novel tasks. Students' learning is facilitated through tasks that promote divergent thinking and require them to draw from their learning in several modules and allow a variety of acceptable/appropriate/valid responses. Teachers might find themselves considering the plausibility of the solutions and then awarding marks on the basis of students' accounts of their problem-working strategies. (NB. It is not a good idea to automatically join the phrase 'problem-solving' with 'creativity'. The first is often convergent, the second employs both divergent and convergent thinking. Creative-thinking techniques which promote both divergent and convergent thinking can be used to bridge the gap [Baillie, in press]).

Developing students' knowledge about creative learning processes. If students understand the 'rules of the game' and why the programme is as it is, then they are better placed to reflect and enter into the spirit of the creativity game. The development of skills in creative thinking is particularly important in enabling students to think freshly and differently about their problem working situations (De Wulf and Baillie 1999, Baillie 2004).

An emphasis on learning. For understanding rather than learning for extensive content mastery. There is evidence that an emphasis on coverage encourages superficiality. Superficiality is not conducive to creativity. Understanding, which comes from covering less ground with more emphasis on the underlying concepts, strategies and assumptions, *is* conducive to creativity. Put it another way: cover less material but in ways that help students to understand more about the domain and its complex learning outcomes and their own engagement with the learning process. They might also approach problem-working using creative-thinking techniques which encourage divergent rather than convergent ways of thinking.

Knowledge and capability/learning transfer. Being able to use knowledge, skill and behaviours developed in one context in another context is an important ingredient for creativity (Gardner, 1993). The ways of thinking outlined above are important in the transfer of knowledge as well as in the generation of knowledge. Learning that involves such behaviours is more likely to be achieved in situations that are experienced as novel and unpredictable to learners. This is what people encounter in real life and they can be simulated in the HE curriculum.

Personal accounts of learning to promote reflection and further learning. The capacity to record, describe and evidence learning and the process of learning are central to metacognition. They encourage learners to recognise their own learning as it emerges and to make claims to understanding and achievement. There is a clear relationship with this aspect of creativity and personal-development planning and other self-regulating behaviours (Jackson, 2002a).

Openness to innovation and change. Possibilities for change need to be designed into the module from the beginning so that teachers and students can respond to what emerges from the process.

Assessment. Synoptic assessments that enable students to draw together and apply their learning throughout a course (such as final-level projects and dissertations) provide important opportunities for students to demonstrate their creativity and self-expression. Strategies that require students to reveal their understanding of how they have acquired core learning outcomes from a course (e.g. through reflective report or portfolio) offer another way of demonstrating their creativity.

Student instrumentalism, driven by the teachers' belief that students only learn when they are assessed, inhibits creativity. Narrow, summatively driven assessment practices and criteria that focus on what is known, which do

not recognise the process of learning or emergent unanticipated learning outcomes, inhibit creativity.

processes that foster creativity

Many of the characteristics of designs that prompt students' creativity are those found in learning strategies that are process-based, i.e. in which the process of learning is as important as the results of learning. A curriculum that nurtures and enhances students' creativity is one that is rich in the experiences of learning. They are process-rich rather than being overloaded with content. They move away from teacher-directed classroom situations and embrace more facilitated and collaborative models of teaching and learning. They work towards enabling students to be self-directing, self-regulating and resourceful learners. They give them space to learn through the experience and processes of learning. To achieve this condition students have to be properly prepared and supported. They need to acquire the habits and behaviours and self-awareness of self-regulated learners (Zimmerman, 2000). Self-regulated learning involves self-determined processes and associated beliefs that initiate change and sustain learning in different contexts. It is fundamentally linked to:

- metacognitive processes such as planning, organising, self-instructing, self-monitoring and self-evaluating one's efforts to learn
- behavioural processes such as selecting, structuring, and creating environments for learning
- processes and beliefs that motivate self-regulated people to learn – such as beliefs about their own capabilities to learn, beliefs that the outcomes of learning will be worthwhile, intrinsic interest in the task and satisfaction or dissatisfaction with their own efforts to learn.

There are a rich variety of learning processes and curriculum designs that provide experiences of learning in novel and emergent situations including problem-based, enquiry-led, work-based, context-based, collaborative learning, game-play, role-play and simulations and enterprise (Boyle and Smith, 2002; Ellington, 2002, 2004; Newman, 2004; O'Rourke and Kahn, 2004; Kneale, 2004). We have also seen through the idea of a life-wide curriculum, that there are also lots of opportunities for experiential learning outside the academic curriculum.

reflections

Writing this piece has made me realise that there are many parallels between the thinking that has emerged from our fairly ad hoc and intuitive exploration of creativity in the higher education context and what has emerged through the systematic and sustained process of engagement in the schools curriculum. The visualisation of creativity recognised in the schools system is very similar to the set of characteristics we have evolved through discussion and enquiry with higher education teachers. Furthermore, many of the potential solutions to the problem of engaging with creativity in the educational process that have been found in the schools curriculum seem to be similar to the potential solutions that we have discovered through our network-based learning project. I was unaware, until I wrote this piece, of the desire to encourage, recognise and value creativity beyond the school curriculum and idea that parallels thinking about a life-wide curriculum in higher education.

But there is a significant difference between the pre-university and university sectors of education: ideas and practices for promoting and supporting creativity and self-expression in the school's sector have been systematically embedded in the early year, primary and secondary school system whereas the ideas that have emerged through our project are only a set of ideas and small scale experiments. The question remains: **how might we promote more systematic engagement with creativity in a higher education system containing autonomous universities and colleges.**

The best example we have of the systematic introduction of a new form of learning in UK higher education is that of Personal Development Planning[13]. Following several decades of practitioner engagement with 'recording achievement' the ambition to introduce PDP across the whole HE system was recommended in the National Inquiry into Higher

[13] http://www.qaa.ac.uk/academicinfrastructure/progressFiles/default.asp

Education (1997) chaired by Lord Dearing. An alliance of the universities and colleges representative bodies, Quality Assurance Agency and practitioner networks engaged in a system-wide consultation in 1999 before agreeing a minimalist principle-based policy in which institutions, rather than a central authority, was responsible for determining the nature of practice to support PDP. This resulted in diverse interpretations and practices (some good some not to so good) but in the belief that any movement towards a new practice goal is better than no movement, the approach achieved the objectives of engagement and ownership. Eight years on all institutions have their own policies and practices, a core of enthusiastic practitioners and many less enthusiastic staff, and all students experience some form of PDP. Where we are now provides a starting point for better practice built on a foundation of practical experience. Furthermore, the introduction of PDP provides a pedagogic foundation for other forms of learning that require greater self-awareness and capacities for self-regulation. In the context of this paper it provides an underpinning pedagogy for forms of education and experience that encourage creativity and learning through experiences of trying to be creative.

I think this way of approaching the initial introduction of new thinking about learning and the progressive growth of practice would be equally appropriate for introducing a stronger engagement with creativity in the curriculum in a systematic and sensitive way. Our conversations with the academic community and the responses when people vote on propositions about creativity, suggests that the system would be ready for such a debate. And if there were incentives attached and a well supported network of professional interest then system-wide practice and cultural change could be accomplished within a 5 to 10 year time scale.

One thing is certain, creativity alone is not enough. It must be nurtured alongside that package of dispositions, qualities and capabilities necessary for success when tackling difficult problems. I agree with Ron Barnett (2008:15) when he says " 'Will' is the most important concept in education. Without a will nothing is possible."

Being creative is a matter of choice, a matter of opportunity(often self-created) and a matter of knowing how to be creative in a given situation (or having the confidence to try and learn through the experience of trying). If we want learners to be creative we have to foster their will to be creative and help them develop the confidence, knowledge and capabilities to be creative. Imagine inventing an education system that has will as its core value and purpose.

A summary of research carried out through the imaginative curriculum project together with a synthesis of practical advice and resources to support the development of creativity in higher education, can be found in N.J. Jackson et. al. (eds.) *Developing Creativity in Higher Education: an Imaginative Curriculum*, London: Routledge-Falmer. 2006.
http://www.taylorandfrancis.co.uk/

Some of the working papers I have written can be found on my wiki
http://normanjackson.pbwiki.com/

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Appendix 1 Richard Green's 60 Models of Creativity 'Minimalist Definitions'

This questionnaire was developed by Richard Greene (http://www.scribd.com/people/view/310309-richard-tabor-greene). It presents 60 models of creativity, found in the minds and work procedures of 150 highly creative people. Richard has given the Surrey Centre for Excellence in Professional Training and Education (http://www.surrey.ac.uk/sceptre/) permission to use to the questionnaire to: a) raise awareness of the different ways in which people understand their creativity and creative processes b) gain a sense of what models of creativity are more or less used by people in their acts of creativity. Information provided will only be used anonymously. Synthesis reports will be available at:
http://normanjackson.pbwiki.com/discovering-creativity-in-higher-education

Guidance: Please read the minimal definition statement and circle one number that indicates the relative importance that this model of creativity has for you in your work practices and contexts.

What is your field of practice?		
What does being creative mean to you?		Circle One Number
Creativity is important to my identity as a human being		*unimportant essential* 0 1 2 3 4 5 6 7 8 9 10
Creativity is important to me in my professional practice		*unimportant essential* 0 1 2 3 4 5 6 7 8 9 10
Model	Minimal Definition	*unlike me/very like me* 0 1 2 3 4 5 6 7 8 9 10
Recommendations	**I collect recommendations from mentors, peers, and others on how to be creative in general or on how I can be more creative, organize them, and regularly review them to improve the creativity of my work.**	0 1 2 3 4 5 6 7 8 9 10
Traits	**I collect traits that creative people, works, domains, and fields have, organize them, and regularly review them to improve the creativity of my work**	0 1 2 3 4 5 6 7 8 9 10
Question Finding	**I collect ways that creative people find great questions to tackle, organize the, and regularly review them to improve the creativity of my work.**	0 1 2 3 4 5 6 7 8 9 10
Darwinian Systems	**I notice how persons and works in my domain, and how my domain itself and the people who run it, all four, foster the basic evolution functions of variation, combination, selection, and reproduction. I use the result to position myself for maximal creativity.**	0 1 2 3 4 5 6 7 8 9 10
Combined Thought Types	**I select certain types of thinking and develop them individually as well as exploring possible combinations of them till creativity results.**	0 1 2 3 4 5 6 7 8 9 10
Garbage Can	**I use nearly all fundamental parts of my existence from personal identity to social dynamics around me to ways of work to develop partial creations of life and work style that become tools for making creative works.**	0 1 2 3 4 5 6 7 8 9 10
Culture Mixing	**I use the various cultures I have been exposed to, have within me, or live among now, blending them till creation emerges.**	0 1 2 3 4 5 6 7 8 9 10
Discipline Combines	**I use the various fields I have been exposed to, have mastered, or live among now, blending them till creation emerges**	0 1 2 3 4 5 6 7 8 9 10
Tuning	**I position myself between extremes and polar opposites, tuning my approach toward subtle points between extremes where creativity happens.**	0 1 2 3 4 5 6 7 8 9 10
Paradox Doorway	**I seek out paradoxes and force myself against them till they, in turn, force my thinking out of its ruts and into lateral, peripheral new paths that open up creativity to me.**	0 1 2 3 4 5 6 7 8 9 10
Scale Blend	**I seek out phenomena on multiple size scales, aligning them by similarities of various sorts, till phenomena on one size scale solve major problems on other size scales**	0 1 2 3 4 5 6 7 8 9 10
Idea Marketing	**I market ideas within my own mind to various viewpoints I can develop mentally, then select best fit ideas to market, again within my own mind to representations of actual social market forces in my field, till I come up with a creative work as the package that transmits that idea to those social market forces in my field effectively.**	0 1 2 3 4 5 6 7 8 9 10

Community of Ideas	**I assemble possibly relevant ideas and let them interact as their own natures dictate, noticing how they pair up, conflict, sequence themselves and in general inter-relate, till powerful interesting such idea assemblages come to my attention as possible creations**	0 1 2 3 4 5 6 7 8 9 10
System Model	**I influence the social judgement dynamics of that field of people who judge what works are creative or not in the domain in which I work by tuning the dialog among myself, my creative work, those judges, and rules of the domain till creation appears.**	0 1 2 3 4 5 6 7 8 9 10
Social Computation	**I am in the midst of a community of people among whom flow various social computations having inputs, outputs, and processors consisting of layers each more flexible than the next of hardware, firmware, software, in each layer of which are operations each having input, output, and processor (repeating the above endlessly). I manage that flow till at where I am in the community a critical mass of ideas appears that becomes creativity.**	*unlike me/very like me* 0 1 2 3 4 5 6 7 8 9 10
Social Movement	**I am in the midst of a community of people among whom frustration builds up till released into a social movement of new ideas by the slightest particular new idea, avalanching the entire community into a new overall idea configuration.**	0 1 2 3 4 5 6 7 8 9 10
Space Sharing	**I share the same intellectual space with a community of like-minded others, inventing tools that intensify that sharing and pursuing competitively similar intellectual goals till rather unpredictable slightnesses among us and the ideas we work with cause creativity to appear somewhere among us.**	0 1 2 3 4 5 6 7 8 9 10
Participatory Design	**I notice how in modern societies specialization of function has stripped certain kinds of thought, thinking, collaboration, feeling, from entire populations concentrating it in profit-making centralized industries and create by undoing important pieces of that harmful over-centralization and over-concentration.**	0 1 2 3 4 5 6 7 8 9 10
Mass Solving	**I define a certain solving process and get many people to simultaneously apply it while interacting with each other tuning their motivations, interactions, and configurations till creativity emerges.**	0 1 2 3 4 5 6 7 8 9 10
Process Deployment	**I come up with one interesting process after another and deploy them across certain social configurations of people, tuning motivations, interactions, and configurations till creativity emerges.**	0 1 2 3 4 5 6 7 8 9 10
Optimize Ideal Flow	**I identify the intended flow of energy through particular systems and optimize the design, environments, conditions, and controls of the system to get as close as possible all of the energy to flow in the intended path through the system till performance or qualities never seen before emerge.**	0 1 2 3 4 5 6 7 8 9 10
Meta-Cognition	**I organize my tools, facilities, collaborators, associated institutions and relationships for heightened meta-cognition--awareness of how we think and work till creativity emerges.**	0 1 2 3 4 5 6 7 8 9 10
Social Connectionism	**I work in certain idea layers and social relationship layers combining and selecting what comes both to my conscious symbolic mind and what comes to my unconscious associative mind, coaxing ideas and relationships through phase changes till creative new patterns emerge.**	0 1 2 3 4 5 6 7 8 9 10
Demystification	**I return power to people who have been habituated to giving power to things outside themselves via creating works that communicate a demystifying-of-the-world-message-- that makes people conscious of how they have given power and options to things outside themselves that rule them unwholesomely.**	0 1 2 3 4 5 6 7 8 9 10
Dialectics	**I find myself embedded in large evolving forces and patterns, defining myself by opposing large established ways, as younger ones gradually define themselves by opposing my work as large established way.**	0 1 2 3 4 5 6 7 8 9 10
Compilation Cycle	**I work with many different traits that knowledge has, compiling knowledge from one format to another watching how that affects those traits till gaps, distortions, elaborations or the like in those traits reveal creative possibilities to me.**	0 1 2 3 4 5 6 7 8 9 10
Relocating Idea Ecosystems	**I work in several different ecosystems of ideas and by bridging particular ideas from one ecosystem to another or from one idea ecosystem to a different social ecosystem, I turn them into creations.**	0 1 2 3 4 5 6 7 8 9 10
Idea Waves	**I find myself in an ocean of ideas where waves of coherent different sets of ideas wash over the diverse parts of society, including me, regularly such that by setting up tools and workstyles that catch these passing waves and combine ideas across them, I end up creating.**	0 1 2 3 4 5 6 7 8 9 10
Fractal Recurrence	**I live among different schools of thought that arise and oppose one another, fuse and split, so that I use how very abstract idea polarities and oppositions keep reappearing through time and on different scales of thinking to, by doing the next inevitable step in this process, create.**	0 1 2 3 4 5 6 7 8 9 10
Solution Culture	**I notice how people often choose exactly those solutions guaranteed to perpetuate their problems, how failures and missed opportunities are not accidents so much as logical extensions of entire "cultures of failing" that build up unseen in people--by reversing traits of such failure cultures I invent and apply solution cultures that then**	0 1 2 3 4 5 6 7 8 9 10

	create solutions to long standing recalcitrant problems.	
Simple Programs	**I analyze situations till I find a way to model all the interesting and important complexity of the situations using the simplest thinkable system types yet capable of generating all that complexity, then by changing such simplest system parameters I generate hosts of creations.**	0 1 2 3 4 5 6 7 8 9 10
Policy by Experiments	**I try certain strategies or policies in order to generate data about how reality is really working, then use that revealed data to redefine the problem and devise better strategies and policies revealing in turn better data on the basis of which to devise better strategies and policies, repeated endlessly till creation emerges.**	0 1 2 3 4 5 6 7 8 9 10
Creation Events	**I gradually find and combine components of an idea or approach, assembling various people, resources, ideas into a series of events, designed around particular idea or people combination procedures, taken from experts, from which emerges a final creation.**	0 1 2 3 4 5 6 7 8 9 10
Fractal Model Expansion	**I organize ideas into multi-scale hierarchies, tightly ordered vertically in layers and horizontally in idea-categories, then I expand the geometry configuration of the ideas, inventing new ideas at every level and category, coming up with dozens of creations at once.**	*unlike me/very like me* 0 1 2 3 4 5 6 7 8 9 10
Social Automata	**I tune the interactions among many interacting people, arranged in certain neighbourhoods and trained in certain behaviours of interacting, adjusting connectedness, diversity, and deployment of initiative-taking in the system till creations emerge.**	0 1 2 3 4 5 6 7 8 9 10
Create by Balancing	**I envision my domains of thinking and work using very comprehensive abstract models to spot slighted dynamics and over-emphasized one, then create by devising tactics that rebalance the domain by emphasizing slighted dynamics on my abstract models or slighting over-emphasized ones.**	0 1 2 3 4 5 6 7 8 9 10
Non-Linear Systems	**I build models of my domain as a network of non-linear interactions among populations of agents with butterfly effects, system avalanches from one attractor to another, first mover advantage, and I tune interactions among agents till better than expected results simply emerge from sudden system-wide avalanche events.**	0 1 2 3 4 5 6 7 8 9 10
Darwinian	**I set up competing ideas, approaches, relationships, or events, such that traits of successful ones combined with variants I invent populate a new population of competing entities, the whole system evolving till a creation emerges from this natural selection like process.**	0 1 2 3 4 5 6 7 8 9 10
System Effects	**I, like everyone else, suffer from surprises as system effects, unanticipated and unanticipatable in the non-linear realities of our lives, intrude, but, unlike everyone else, I catalogue, explore, and develop tools for using these non-linear effects till they become dependable creations.**	0 1 2 3 4 5 6 7 8 9 10
Surprise	**I catalogue and study system effects and I catalogue and collect unusual frameworks for viewing matters in my domains, using the former to anticipate surprise types and the latter to reveal surprising phenomena, till one such surprise turns into my creation.**	0 1 2 3 4 5 6 7 8 9 10
Adjacent Beyond	**I start with small tiny creations, that accumulate and combine with each new such creation I make, to make myriad new combinations, some of which are creative, which when identified, pruned of noise, and combined with my past creations, spawn still more combination possibilities, some of which turn out to be creations, exponentially continuing my stream of creations.**	0 1 2 3 4 5 6 7 8 9 10
Population Automaton	**I manage populations of interacting ideas on multiple levels of ideas-in-mind, feeling responses, performance moves and improves, parts of organizations till insights as nonlinear system avalanche events happen, generating creations.**	0 1 2 3 4 5 6 7 8 9 10
Subcreations	**I invent little tools and processes, decor and arrangements of my personal living and workplaces to help me create still more creative tools, processes, decor, and work arrangements, in a continuing exponential stream till later ones turn out to be creations or to enable me, using them, to create what others, lacking such tools and work arrangements, cannot imagine or produce.**	0 1 2 3 4 5 6 7 8 9 10
Productivity	**I generate a lot of ideas and throw away the bad ones, and, by generating ways of producing more ideas than nearly anyone else in the same periods of time, and accumulating experience from throwing away bad ones, more and more of my ideas become creations.**	0 1 2 3 4 5 6 7 8 9 10
Performance	**I understand that I am a performer, and my performances are the ideas I produce, which perform before various audiences, using an anthropological stance of seeing the limitations of culture of my audiences and the theological stance of seeing the limitations of life itself and how my audiences position themselves within them to make my ideas creations.**	0 1 2 3 4 5 6 7 8 9 10
Influence	**I seek to influence people and the world via explosively producing disillusionment with existing frameworks with what I create which must be timed and positioned, packaged and expressed so as to influence the field of people in my domain.**	0 1 2 3 4 5 6 7 8 9 10

Investing	**I manage a portfolio of diversified investments of time, idea, and effort in parallel simultaneous projects attempting unlikely outcomes, mixing venturesome and conservative strategies, till one is a hit, and turns creative.**	0 1 2 3 4 5 6 7 8 9 10
Info Design	**I find myself in webs and configurations of structured information such that particular structural features of these information distributions result in creativity--so I work to locate such webs and locate my self and my work in such webs till I am where creativity emerges in them. I study operations on accumulated past creations that produce new ones then extrapolate them to invent my own creations.**	0 1 2 3 4 5 6 7 8 9 10
Courage	**I have the strange ability to fully appreciate the worth and inventiveness of others and traditions around me while simultaneously challenging and overthrowing all of that in everything I do, resulting in occasional creations where my challenges get accepted.**	0 1 2 3 4 5 6 7 8 9 10
Anxiety Channel	**I notice how the fundamental anxieties of existence inevitably get side-stepped, omitted, and slighted by people in my domain and the works they generate till I spot such slightings and by correcting them reconnect my domain to the deep realities of life, hence, a creation.**	0 1 2 3 4 5 6 7 8 9 10
Extended Self Development	**The first creation I made was myself, which I made by undoing automatic parts of me put there by where and how I grew up, substituting the best from history and the contemporary world, and continuing this invention of myself seamlessly turned into creating in every field I entered as the idea of extending my self via works I create.**	0 1 2 3 4 5 6 7 8 9 10
Interest Ecstasy	**I pursue interest in everything I do, balancing myself at the very edge of all my capabilities and motives, till I am transported beyond myself where forces of the universe take hold of me and use me as a vehicle for their own creating.**	0 1 2 3 4 5 6 7 8 9 10
Career Invent	**I create my self, then I create my own career through this world, then as I transition to bolder and more interesting career paths, I run out of pre-made ones and start inventing new career paths never seen before, till one of these transitions becomes creation.**	*unlike me/very like me* 0 1 2 3 4 5 6 7 8 9 10
Performance Creativity	**I get ideas to perform before me till one set of them captures my interest then I organize ideas into performances before others in the form of works that audiences respond to till creation emerges.**	0 1 2 3 4 5 6 7 8 9 10
Insight	**I alternate engagement and detachment as I apply known frames to a challenge, till I run out of existing frames and have to invent new ones, accumulating failures till they begin to specify, inversely, what eventual solutions must be like, till a slight new idea avalanches the entire set of ideas before me into an emergent sudden insight, that when carefully pruned of noise, reveals a creation.**	0 1 2 3 4 5 6 7 8 9 10
Cognitive Operator Extremes	**I drive my use of certain common cognitive operators in the mind far beyond the intensities of use of them by others till results that no one has seen before obtain, some of them later being judged creative.**	0 1 2 3 4 5 6 7 8 9 10
Making Sense	**I find nearly everything in the world flawed, sloppy, half baked, deeply unsatisfactory, and lacking basic sense, and I cultivate this negative vision capability till I see hundreds of ways to improve virtually everything in life around me, focussing on a few which I actually fix till judged creative.**	0 1 2 3 4 5 6 7 8 9 10
Percept Invent	**I am drawn to the paradoxes, contradictions, gaps, omissions, anomalies, circular arguments in everything around me, seeing spaces where everyone else sees objects in scenes, till I dislocate my own perceptions enough that I see things to fix that when I fix them become creations.**	0 1 2 3 4 5 6 7 8 9 10
Experience Realization	**I keep careful track of my experiences accepting no common thoughts, explanations, without making sure they make complete sense to me and completely explain my experience of things, till I find something everyone else accepts and depends on that has a deep gap in it that does not fit my experience--by fixing it I do what others judge creating.**	0 1 2 3 4 5 6 7 8 9 10
Substrate Update	**I watch as a never-ending stream of new substrates for doing functions enters the world, from global commerce, research, and technology every day and year, and observe when existing functions and institutions hold onto past substrates at great cost way past the time when there are good alternatives substrates--by pioneering replacement of past substrates for doing functions with new ones from that never-ending stream, I create.**	0 1 2 3 4 5 6 7 8 9 10
Are there any other models that are important to you?		0 1 2 3 4 5 6 7 8 9 10
Are there any other models that are important to you?		0 1 2 3 4 5 6 7 8 9 10

I greatly appreciate the time and trouble you have taken to share your perceptions of your own creativity.

Please return your completed questionnaire to
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