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NESTA Making Innovation Flourish

Beginning at the beginning

The creativity gap

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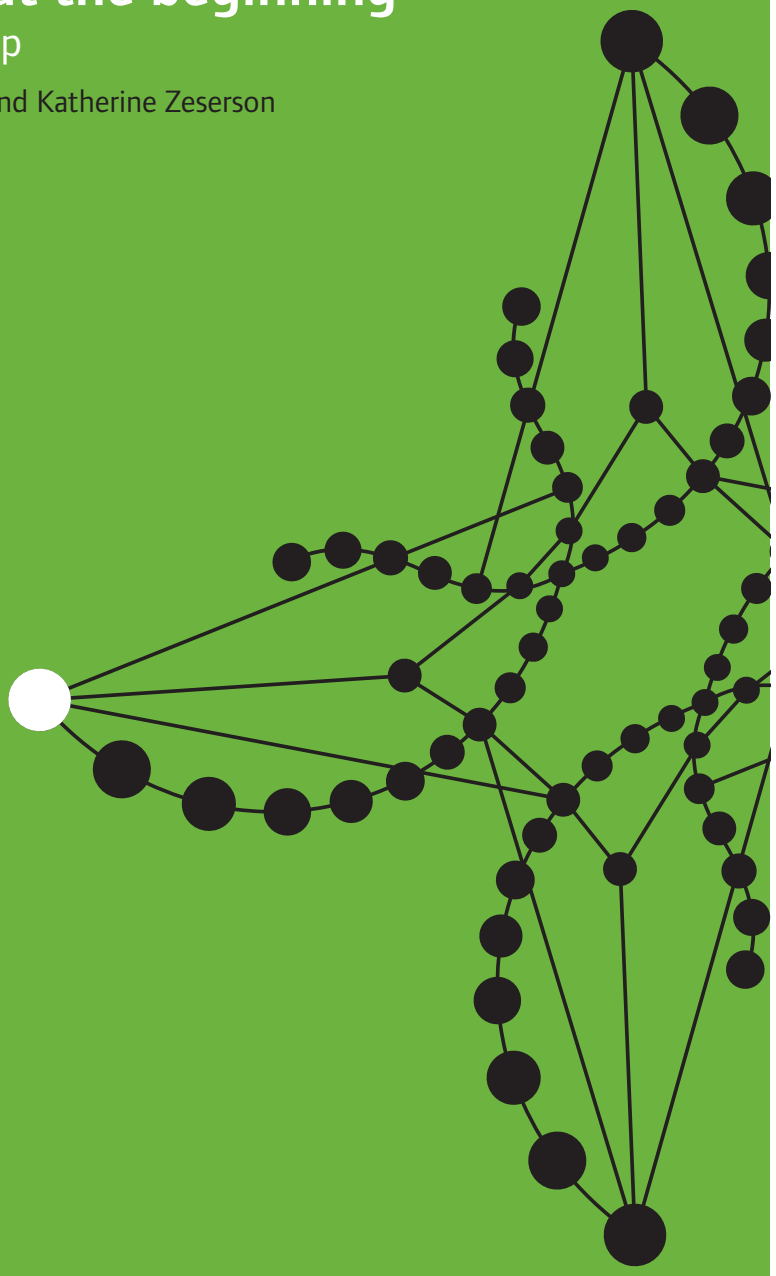

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Creativity and innovation: the chicken and the egg

For the last sixty years the worlds and languages of culture and business have been uneasily counterpointed against each other: the arts constantly urged to be more 'businesslike'; industry and commerce told that their future lay in becoming more creative. Ever since Adorno first used the term 'culture industry' during World War II (polemically, in comparing mass industrial production with the new phenomenon of mass culture), these two worlds have been locked in an uneasy, constantly shifting embrace.[1]

Since Adorno, creativity and the 'creative industries'[2] have gained new prophets. In books like *The Rise of the Creative Class* and *Cities and the Creative Class,* the American urban studies theorist Richard Florida controversially identified the 'creative class' as a key engine of urban regeneration. More recently, in *Flight of the Creative Class,* his thinking has moved on; instead of limiting the dynamic, regenerative potential of creativity to the activities of just one specific 'creative class', Florida now argues that engaging the creativity of everyone – not just the 30 per cent of people in 'creative class' jobs – is the real key to unleashing economic growth.[3]

Paralleling this emphasis on creativity's role in economic development, recent years have also seen a growing understanding of the importance of innovation in successful business, industry and commerce. At first, the fact that creativity and innovation have come to occupy such similarly prominent positions across contemporary debate looks helpful, but it has given rise to some treacherous confusions. Creativity is romantically painted as the preserve of the arts and cultural worlds; serendipitous, transitory, even precious but ultimately somewhat unreliable. By contrast, innovation comes across as creativity's harder-nosed older brother; as if, although innovation must necessarily call upon creativity, it doesn't need all that much of it.

That polarisation is simplistic and dangerous, and risks brutalising our appreciation of both innovation and creativity – and especially of their relationship with each other. While innovation stands specifically for the successful exploitation of new ideas, creativity plays an essential role in the whole process. Without creativity, there can be no innovation. Far from simply being the light-bulb moment, creativity is more properly viewed as innovation's very heartbeat: not just its impetus, but its essential substance.

The recognition of creativity's underpinning contribution to innovation (as well as the importance of the 70 per cent of the population who lie outside Florida's original 'creative class') has mostly stopped short of seeing what lies further down that analytical road. In understanding the real contribution of

creativity to society (and in understanding the role of innovation in business) the critical connector – bridging the gap – is that the arts, sciences and economic innovation are all in different ways *driven* by creativity.

What price, creativity?

Over the last 200 years in England (we will come to other countries later on) we have developed an uncomfortable relationship with creativity. Creative people feel pigeon-holed ("are you a musician?") as if the epithet 'creative' only applies to unusual, specially endowed people; and it is traditionally spoken with a typically British innuendo of suspicion. Creativity is seen as an exciting quality, adding richness and depth to cultural life, but not of much relevance either to the development of public policy or to the hard-headed commercial world of business schools and MBA syllabuses – though the University of Chicago's Graduate Business School has found a splendidly quixotic solution to that challenge, of which more later.

In the last twenty years, the UK economy has been increasingly viewed as divided into 'creative' businesses and (by implication) non-creative businesses. But 'creative' is not an attribute of particular kinds of business; it is an attribute of particular kinds of thought, and can be present or absent in any business.

This association of 'creative' with particular sectors of the economy echoes other legacies of our Industrial Revolution in privileging a "special people in special places" view of the world, seeing creativity as the preserve of a small, select priesthood.

But creativity is not an elite process, or the preserve of some particular group. It is simply a distributed mental activity involving imagination and lateral thinking, frequently across conventional boundaries, and often drawing together people of diverse backgrounds. Creativity adds extra firepower to the otherwise narrow trajectory of innovation – both in the generation of completely new ideas and the creative development and enrichment of existing ones.

Richard Florida again: "What makes human beings unique is one thing – creativity. All else are subsets. Creativity powers economic growth."[4] This carries important lessons and messages for wider economic and social innovation, beyond the boundaries of the DTI's oddly limited and limiting definition "the successful exploitation of new ideas."[5] This paper starts from the belief that most successful innovation is founded on creative thinking, and therefore that ensuring creativity is more widely available will be critical in securing the UK's position in an increasingly competitive, fast-moving global marketplace. So we need to find answers to these two key questions: where should we look for the source of creativity, and how do we demystify and nurture it?

We live at a time when the turbulent processes of social, political and economic change are at last forcing us to confront critical, long-term policy questions which

we are finding very difficult to solve. The challenges of climate change, of ensuring equitable distribution of food across our planet, of addressing the economic and social implications of our ageing population, the pensions time-bomb – these questions and others like them continue to defeat most of our attempts at solutions. We are now starting to recognise them as questions which simple incrementalist policy development cannot solve. They need bold steps; innovative policies; creative ingenuity.

Indeed, in many fields the mark of creativity is now understood as the ability not to solve a problem, but to be able to discover one.[6] As to where it comes from, increasingly researchers are concluding that this capacity to think creatively isn't simply a function of a random genetic lottery, it can be developed and nurtured in all humans – and so (by implication) can also be stifled, or starved.[7]

Creative thinking, characterised by imagination, open-mindedness and an eager willingness to explore unexpected routes, offers us tools to address these kinds of problems where other approaches have not succeeded. Creativity has a strong claim to be the mental characteristic that can add unique value and potency both to policy development and to commercial and business success. Creativity is not a suspect indulgence in the serious world of business. In an aggressively globalised marketplace where the UK can no longer compete on wages, on available armies of low-skill workers or on abundant natural resources, creativity is now becoming our most precious resource.

We need creativity now more than at any time since the Industrial Revolution – and its marginalisation during much of the 20th century may go a good way to explain why so many of our industries have fallen behind international competitors in fields where Britain once led. Had our motor industry, for example, been characterised more by creative adaptability and less by institutional rigidity, it might not have come to be seen as a case study in industrial decline.[8] We can no longer allow ourselves the vulnerability of creativity being delivered by only a few. As John Holden puts it: "our future success as individuals, cities, regions, nations, and possibly our survival on this planet, depends on our capacity to innovate."[9]

But several key trends in UK education in the last twenty years have been taking us in exactly the opposite direction. Vocation-conscious Further Education values the messiness of raw creativity less and less, increasingly confining student achievement within the boundaries of simplistically measured competencies. This doesn't derive from any malevolent intent to oppress or subdue; rather from a pragmatic recognition that the employment marketplace into which most FE students are discharged seeks to sift and sort their value through glumly standardised, pre-determined, output-focused skill sets. Who knows what creative contributions are lost in this low-aspiration, high turnover workforce production line? Higher Education is getting more vocational as well. Now that

student fees have gone up, there has been a marked increase in applications to vocational courses and away from academic ones – for example Winchester School of Art has increased its intake for commercial graphic arts, and completely abolished its art history department.

Work-based learning for young people – today's version of apprenticeship – is often so task-oriented that it overlooks the need for the lateral thought and imaginative power we understand by creativity. Partly, there is little economic incentive to create truly creative learning opportunities in those industries that can directly generate profit from the cheap, low-skilled labour force made available through this vocational training – areas like construction and some sectors of manufacturing.[10] Partly, work-based learning is still seen as a means by which those who don't 'make it' to the Olympian heights of Higher Education can be rendered fit for purpose at lower levels of the workforce – a world view not so very far beyond Fritz Lang's *Metropolis*.

This is short-sighted. We have made an ethical commitment to ensuring a reasonable standard of living for all our citizens, which means we can't easily compete with economies whose labour costs are lower than ours; that's precisely why we should be investing in the creative thinking capacities of our entire workforce to give us renewed competitive edge – including those historically deployed at the bottom of the production hierarchy.

Human potential for creative thinking is society's ultimate renewable energy source, and we've access to as much of it as we have people in our world – provided their creative thinking is nurtured, developed, valued and shared. However, like all energy resources it can be squandered, wasted, misapplied or untapped; or simply lost through neglect, mismanagement or ignorance.

Holden again: "The stakes are high, because the hot spots of creativity, be they individuals or groups of people in a particular place, are getting richer while the rest lag further and further behind. The dark side of creativity is that we risk having a class of creators and a sub-class of service providers."[11]

Well met by moonlight

The English are not always quick to see the value of learning from experience in other lands, and in this field we have failed as a nation to read the increasingly clear lessons of other countries and communities, or even of our own past. Where is today's creative cauldron to match that 18th century Birmingham dining table around which the Lunar Society sat?

In its heyday, it brought together England's leading scientists and innovators, launching upon the world ideas that have had a defining effect on the development of both the city and the country ever since – the steam engine, gas lighting, the isolation of oxygen, the first viable technique for cataract removal, the first mechanical image copying machine, fraud-resistant coinage, and carbonated drinks! Science, industry, medicine and transport were profoundly influenced by its members meeting to exchange information about experiments in the work-place, scientific discoveries and commercial opportunities.

Those legendary pioneers – Matthew Boulton, James Watt, Josiah Wedgwood, Erasmus Darwin, Joseph Priestley – were explorers for whom creativity was not a facet of their businesses but a defining quality of their minds, of their lives and of their approach to the world around them. We need to recapture that recognition that creativity is not an indulgent and commercially irrelevant lifestyle choice, but an essential dimension of everyday life and everyday work.

Outside the UK, business schools across Europe and America are now cautiously starting to introduce 'creativity' into their curricula, engaging their students in imaginative play and creative activities – building sandcastles, making films, cooking banquets – in a feverish attempt to improve their students' lateral thinking, imaginative application, teamwork and leadership skills. "The University of Chicago's Graduate School of Business, renowned for its rigorous quantitative curriculum, recognizes that students also need to be let loose on less structured, creative projects. As part of its leadership development program, M.B.A. students produce short movies about their experiences at the school and compete for a Golden Gargoyle award."[12]

Whilst we can all smile at their surreal new version of the Wizard of Oz that famously featured "the lion as a confused career changer, the tin man as an investment banker looking for a heart, and the scarecrow as a marketer trying to become more quantitative,"[13] this does feel like a hasty repair on the stable door long after the last horse is away over the horizon.

The natural innovators

The problem with encouraging MBA students to rewrite The Wizard of Oz is simply that it comes far, far too late in people's lives. We need to take many steps back from the world of business schools if we are to find the critical fork in the road, the moment of choice where the real opportunity lay.

Babies and pre-school children universally and instinctively explore their world through imagination and investigation. If not blocked in their impulses, they assiduously test and re-test their experiences and hypotheses; imagining, inventing, and innovating.

In our earliest years we play uninhibitedly with the full range of human languages – mathematical, musical, scientific, kinaesthetic, visual, spatial, and emotional.[14] We rehearse our imagination out loud in speech and song, through visual representation, through building and sculptural play. Imaginative languages – musical, story-based, visual – are the natural and instinctive domain of the pre-school scientist.

Pre-school children exhibit in spades all the mental and emotional characteristics that we understand as creative. 'Possibility thinking' is how researchers describe what happens when children "engage with everyday problems at a deep level and pose 'what if?' questions that encourage them to seek novel and unusual solutions."[15] The stream of free-flowing invented song so characteristic of pre-school children's communication "provides fertile ground for the development of generative and creative dispositions." This creative, communicative, joyful activity "plays an important role in building cultural, social and emotional capital."[16]

We all begin life as song-makers. It is as we get older and are subject to the increasingly prescriptive world of formal education that the omnivorous, generative possibility-thinker within each of us starts to lose confidence and shrink; partly in response to our own psychological and intellectual make-up, partly in response to external shaping and pressure.

The narrow gate

In so many ways UK society is still absorbing the profound impacts of the 19th century on our social structure and our education system.

Like Chou En-lai's famous response in 1972 when asked to assess the historical effect of the French Revolution (that it was "too soon to tell"), we are only now starting to see the difficulties lurking in the complex legacies of the Industrial Revolution beside the more obvious benefits. One of its legacies has been to produce a culture that doesn't value imagination, creativity, philosophical thought or innovation in the mass of citizens, regarding those qualities instead as the preserve of an elite, closed, mysterious group.

Despite the laudable – but restricted and very recent – attempts at change we'll discuss below, much of the present-day English education system still operates on the 19th century model; as a mechanistic process designed to equip the greater proportion of children with a minimum standard of literacy and numeracy, and then smaller and smaller numbers with a more refined or advanced range of skills and capacities – these numbers broadly proportional to the number of jobs at different levels in the traditional industrial workplace.

Once our natural 4-year-old innovators move beyond early years learning environments, they start to pass through an increasingly narrow series of educational gates, continually reshaping themselves to fit through these shrinking gaps. Non-standard creative responses; unconventional approaches to problem-solving; artistic inspiration; uncommon, non-linear thought processes and questions that don't fit the curriculum are increasingly discouraged, as young people's intellectual and creative processes are standardised so that their outputs can be consistently measured against a pyramidal norm.[17] Imagination, enterprise and investigation are discouraged and gradually recede. As a society, we lose a large proportion of our natural innovators through the ten Procrustean* years of this process.

It is only in the last decade that we have seen an increasingly powerful lobby pushing for the recognition of the importance of creativity in education. Since the publication of Sir Ken Robinson's landmark report *All Our Futures*[18] in 1999, and the subsequent establishment of Creative Partnerships,[19] the idea of creativity in education has started to gain a new credibility in educational policy circles. However (retaining our traditional national unease

* Procrustes (in Greek mythology) kept a house by the roadside in the plain of Eleusis where he offered weary travellers hospitality and a night's rest in his special bed, which he explained had the magical property of exactly fitting whoever lay down upon it. What Procrustes didn't add was the way this "one-size-fits-all" result was achieved - as soon as the guest lay down Procrustes adjusted not the bed but the traveller, stretching him on the rack if he was too short for the bed and chopping off his legs if he was too long!

in this territory) the emphasis has often tended to be on embedding the arts in the curriculum rather than on the critical importance of creative thinking *per se*.

Revealingly, creativity has tended to be brought into school life as a curriculum subject of its own rather than a learning mode or domain – even in the early years. Whilst creativity does now appear in the National Curriculum[20] for 3-5 year olds, it's identified as one of six 'areas for learning' – rather than (as Ken Robinson intended) as a transferable skill – and it's located (like literature's beloved mad aunt, never brought out on important occasions) within creative and expressive arts activities that form discrete, often marginalised, elements of the curriculum.

Paul Roberts in his 2006 paper for the DCMS, *Nurturing Creativity in Young People: A report to Government to inform future policy,*[21] spotted this and tells us: "There is increasing evidence that head teachers are seeing creativity in the curriculum as the way of achieving the next step change in pupil attainment." This presents both a challenge and an opportunity. Raising attainment through creativity is of course a good thing; but reducing creativity to a pedagogic instrument for improving SAT scores wastes the opportunity to achieve so much more.

This is not to knock the many inspirational and life-changing projects that Creative Partnerships and associated programmes have brought to schools. However, that work has been largely focused on using the arts to facilitate children's learning, and to develop children and teachers as artists.[22] These are important areas of endeavour and should be extended and made more widely accessible; but they aren't striking at the heart of the problem. We are still imprisoned in an educational model that positions creativity as a set of peripheral behaviours, at best relating to the arts, to fun and to social development; at worst as the indulgent and irrelevant preserve of a few privileged dilettantes.

Moreover, much of the current focus on arts and creativity in schools is directed at the statutory age range, largely focused on Key Stage 2 (7-11 years) and Key Stage 3 (11-14 years), as well as being patchy in its geographic reach. So we are back with the problem of Chicago's brave new Wizard of Oz and his friendly investment banker/Tin Man – too little, too late. If the creative thinking capacities of pre-school children haven't been valued and encouraged before they enter the confining strictures of the formal curriculum, they're much less likely to use those capacities to aid them in the development of the so-called 'basic skills'. Instead they're much more likely to regard their own creative impulses and thought processes as marginal; to be brought out to play on Thursday afternoons when the artists are in school.

By conflating creativity with 'creative' subjects like art, design, music and dance, our education system lands itself in a place where 'creativity' and 'the arts' are treated, very limitingly, as near synonymous. This paper is not making a plea for an education system that

produces more artists, nor (directly, at least) for the teaching of more art in early education – although that may prove to be one fruitful route to achieving these ends. Creativity is not 'the arts'. Creativity is a fundamental attribute that underpins all thought and all learning. Creativity needs to become 'ordinary' – a part of the everyday life of everybody.

Far from being a revolutionary idea, this should be straightforward. It is working with the grain of nature – children are born highly creative, so our challenge is to develop an approach to early years learning that allows them to retain that precious birthright into their later school years and their adult lives, rather than having it trampled out of them before they are five years old. The challenge is to establish an educational framework – a learning domain[23] – in the earliest years that supports, stimulates, values and develops those natural creative capacities as the norm.

Already, innovative early childhood educationalists are looking at how this kind of framework might work in practice, and what assumptions it would rest on. A recent special issue of the International Journal of Early Years Education (focussing specifically upon creativity) sees its editors keen to point out how the contributors "deliberately wanted to move away from the commonly held assumption that creative and cultural education is the preserve of the arts rather than the concern of the curriculum as a whole. Also, we wanted to challenge assumptions that 'cultural' education is solely about introducing children to high culture through drama, music and the arts."[24]

This might seem an appeal to value motherhood and apple pie – so obvious as to not need saying. However the wave of curriculum and policy initiatives triggered by the publication of *All Our Futures* has not protected the early years environment from pressure to conform to an out-moded educational model. Dorothy Gardner's[25] ground-breaking 1942 findings – that children whose early childhood education was characterised by creativity fared better on a range of key indicators than those whose education was predominantly characterised by formal teacher-directed activities – have not been disproved or discredited. Rather, several recent studies have borne out these results, leading a brave charge against the relentless government pressure to focus pre-school education on basic skills – pre-literacy and pre-numeracy.[26]

This is not to lose sight of the importance of the conventionally described basic skills – literacy, numeracy – which are of course the building blocks of all good education. It is more an argument about how things should be taught than it is about the content being taught or the experiences being facilitated. Even in the driest corners of the syllabus there is an increasing weight of evidence from later on in children's educational lives that "promoting creativity is a powerful way of engaging pupils with their learning."[27] Paul Roberts again: "supporting creativity in the early years provides a cornerstone for successful lifelong learning." Echoing

Gardner, he goes on to say, "current research and best practice in early years settings convincingly demonstrate the importance of creative problem solving, collaboration, imagination and social communication as the foundation for learning. The child that practices creative play becomes the socially competent child: a child that can learn and thrive."[28]

This is not an argument for a go-as-you-please, freestyle approach to the early years. Sustainably nurturing creativity in the very young requires a well-developed understanding of child development and an inventive, thoughtful approach to structure and pedagogy.*

It's perhaps helpful to think of the task in terms of inoculation, or insulation. Children are born with precious capacities and abilities which 30 years later the adult world of international commercial competitiveness and of increasingly fragmented and threatened communities will acutely need. Our challenge is to create an early learning environment that channels and 'flame-proofs' the creative core of our young people, so those precious capacities survive 15 to 20 years of formal education and are then accessible as the resource on which the future of our economy and our society will depend.

This committed emphasis on the process of creative discovery and communication in the early years – where children imagine, develop, analyse and produce new things (ideas, artefacts and processes) based on what they find – must form the foundation stone of Charlie Leadbeater's Third Habit of Mass Innovation: "Education systems designed for the innovation economy not the industrial economy."[29] A society of creative citizens is a society of innovators.

* It's important in this context to note, however, that our early years workforce is the least well-trained, least resourced and lowest paid group in the educational economy. As a result, many of its members are people whose own creativity has been stifled or devalued, and who themselves may regard creativity either (at best) simply unstructured play or (at worst) as the specialised attribute of a different 'creative class'.

We are not alone

One of the legacies of Britain's imperial past is our reluctance as a society – still – to recognise that other communities and countries may have solved challenges with which we are still wrestling.

One such country is Finland. Creativity is widely recognised as a key driver in Finnish educational thinking and has featured prominently in Finland's national curriculum for nearly 30 years. Their approach to early years education is based on the theory that play is the most effective learning tool in the early years, since it sets the stage for a lifelong love of learning.

Finnish primary schools employ a creative, play-based curriculum, not introducing standardised testing and forgoing formal numeracy and literacy teaching until children reach seven years of age. As a result, Finnish seven-year-olds lag behind their international peers in terms of reading, yet they catch up almost immediately and subsequently excel. In a highly respected international survey (PISA 2003) conducted by the Organisation of Economic Co-operation and Development (OECD) comprising tests given to 15-year-olds attending both public and private schools, Finland ranked first in reading, joint first (with Japan) in science, and fourth in mathematics out of 31 industrialised nations.[30]

Innovation has been central to the Finns' sense of national identity for more than a century, and the embrace of modern ideas and technologies, often borrowed from abroad, has been vital to a sense of national purpose. Finns see learning and innovation as almost a national duty, one being admirably fulfilled by such success stories as legendary cellphone giant Nokia. Finland – unlike the UK – has even managed to retain a domestically owned car industry. Today, Finland stands as one of the fastest growing and most innovative societies in Europe.[31] Is that really a coincidence?

Further South, the 'Reggio Emilia approach' (as it has become internationally known) is a unique philosophy and pedagogy developed in the Emilia Romagna region of Northern Italy. The 'Reggio approach' encourages children to have a high degree of creative independence from adults, with lessons based around 'provocations' into artistic activity rather than set tasks. As well as valuing teachers as co-learners, taking account of the importance of appropriate spaces for education, and the significance of relationships between community, families, teachers and children, the Reggio Emilia approach focuses on the naturally inquisitive and communicative capabilities of children and is centrally concerned with enabling creativity to flourish.

Through investigation and inquiry in the context of small group project-based work, children are encouraged to co-construct and negotiate solutions among themselves, finding their own routes to overcome the cognitive knots or sticking points they meet along the way. This encouragement of intellectual conflict – called "the engine of all growth" – subsequently spurs progress in problem solving and creative thinking.[32]

The Reggio Emilia educators have won international recognition for their work and provided inspiration to educationalists the world over. Their travelling exhibit 'The 100 Languages of Children' has visited the UK twice (in 1997 and 2005). Its last visit memorably represented a key Reggio Emilia message by the slogan 'Children speak 100 languages, 99 of which are ignored in school.'

Is it possible to prove that this characterful, profoundly creative philosophy of early years education has had an impact on innovation and business development in Italy? That must be the topic for another paper, but again it may not be a coincidence that the highly collaborative networks of small companies sustaining the Northern Italian region of Emilia Romagna have attracted interest from innovation policy makers.[33]

Closer to home, recent years have seen a significant shift in the position of creativity in the Northern Ireland curriculum. Picking up on much of Sir Ken Robinson's thinking and adopting his definition of creativity, Northern Ireland, unlike England, has pressed ahead with educational reforms that are putting creativity at the *heart* of education and training. Examinations and assessments now include a creative component at all Key Stages, and clear steps towards programmes of learning for young people interested and inspired by creativity are well-signposted. Increasing collaboration between government agencies and departments ensures that creativity also has a consistently prominent role across education, culture and employment. One of the core 'Thinking Skills' to be threaded throughout the curriculum is *Being Creative* – children being encouraged and enabled to develop creative approaches to problem solving, to be imaginative, to take risks, to question and explore possibilities.

Although it is too early to draw firm conclusions across Northern Ireland's education and training system as a whole, psychologists at Queen's University in Belfast have noted huge improvements not just in creative fields but also in early years literacy and numeracy among some of their most deprived children. The first 150 children taking part in the study were judged to be "extremely deficient in oral language skills" when they started school at four. After a year their oral skills were judged to have reached the norm for their age – a measurably faster progression than control groups of a similar profile being taught in the traditional way. After three years their literacy and numeracy were just as good as others and, crucially, they were still keen to learn. Joyce Hughes, Principal Early Years Officer for The Northern Ireland Council for the Curriculum Examination and Assessment,

said: "People fear that we are delaying the teaching of reading and writing…but we start from where the children are individually when they come in, then we develop in them the disposition to learn. That has huge implications for later on because it will carry them through the years to come with much better attitudes towards study. They become 'I can' children, not 'I can't.'"[34]

So what's to be done?

Study after study diagnoses the same success factors in effective, successful businesses and organisations – qualities like agility, fluidity, inventiveness, human connectedness, and the essential balance between individualism and collectivism in the generation and production of creative ideas – all hallmarks of the processes of scientific discovery *and* artistic origination and reproduction.

To unleash the innovative capacity of the UK in the 21st century, our education system needs to operate as a whole-community process. We need to nurture the natural creative innovator in all children and then ensure it is protected, nourished and stimulated into adult life, rather than being extinguished by many aspects of our current approach to education.

It follows, therefore, that we must develop a new approach to education. But to be effective, this must be rooted in a new approach to creativity throughout society, associated with a widespread demystification and a deepened public understanding. We need to press home the core message that creativity is not a dimension of some particular industries (present in some, absent from others); nor is it another technocratic trick taught to MBA students; and most importantly it is not a mystical quality granted to just a few exceptional people.

We need to redesign our educational curricula around the potential capacities of human beings rather than simply the perceived needs of international economies. Just as in acupuncture a remedy applied in one place mysteriously cures an affliction in another, so sustaining and nourishing the natural inquisitive and imaginative instincts of young children will give us the foundations for a quite new kind of adult world.

18th century and 19th century Britain proudly boasted an inspirational procession of inventions and discoveries. Many of the fruits of those extraordinary encounters round Birmingham's Lunar Society dining table still underpin 21st century life. The 21st century global economy, with its instantaneous worldwide communications and decision-taking processes may look unrecognisably different from the commercial landscape of the 18th century, but the human qualities it needs are identical.

Technical, vocational and management training are necessary conditions for effective competitive positioning in today's global knowledge economies, but they are not sufficient conditions. In 1840, in the thick of the Industrial Revolution, Louis Blanc, gave us "From each according to his abilities, to each according to his needs."[35] Maybe Karl Marx's adoption of the phrase[36] has sent us down the wrong road – it's

not the second part of the sentence we should be foregrounding in the construction of socially just education and economic policy, but the first. Strip it of its historical, cultural and political associations and you get a straightforward logical proposition: a society in which all citizens are enabled to give fully of their unique abilities will have the capacity to comprehensively meet its citizens' needs.

Creativity is the birthright of us all, abundantly, teemingly present in almost all pre-school children, but thereafter progressively diminished and marginalised as a suspect indulgence in our increasingly narrowly focused approach to education. The UK's 21st century challenge – of being internationally competitive, socially just and environmentally sustainable – may be simpler than people think. We have to find the way to retain in our adult professional workforce the incandescent imaginative qualities with which every one of us was born. Investing in imagination and placing creativity at the centre of the early years learning process, and then valuing and nurturing the natural creative innovator in all children throughout their education, will give us an adult community possessed of the imaginative, responsive qualities we so acutely need to address the challenges of a 21st century so utterly different from those of the 19th.

We need to focus less on teaching young people *what* to think, and more on teaching them *how* to think – beginning at the beginning. The front-runners in tomorrow's economic race will be the nations that today can learn how to protect and preserve the raw creative power of the nursery, building an adult society that understands creativity not as a suspect attribute of a few languid aesthetes, but as the simple, ordinary birthright of every human being, and the essential fuel of the economic engines of the future.

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After reading Politics and Philosophy at Oxford University, Anthony Sargent held a series of BBC radio/TV production and presentation posts before working as Artistic Projects Director at London's South Bank. As Birmingham City Council's Head of Arts for ten years he created the city's Arts Strategy and led many of its most ambitious initiatives, including Birmingham's 10-year festival of the 20th century, Towards the Millennium. In 1999 he joined the management of BBC Millennium Music Live then took on overall responsibility for the opening, management and programming of The Sage Gateshead as its first General Director.

Katherine Zeserson

Over the last 25 years Katherine Zeserson has led music programmes in a wide range of community, education and performance contexts; from pre-school settings to post-graduate and professional training; as well as with theatre companies and choral ensembles. She has advised local authorities and arts organisations across England on creativity, music practice and leadership development, as well as working extensively in Finland as a performer and trainer. She became involved in the development of The Sage Gateshead in the 1990s, working with its founding partners, Folkworks and Northern Sinfonia. Since 2002 she has been Director of Learning and Participation, responsible for the strategic direction and implementation of The Sage Gateshead's ambitious, internationally acclaimed Learning and Participation programme.

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