Professor John Eggleston Memorial Lecture 2004 Creativity: Caught or Taught?

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It is a great honour to be asked to deliver the Professor John Eggleston Memorial Lecture. John Eggleston was always a great advocate of primary design and technology and gave his support to our Centre for Research in Primary Technology at the University of Central England (CRIPT) from its inception.

I first met John at a design and technology conference in Germany in the early 1990s and it was certainly an interesting encounter. John could have taken a non-confrontational approach to some of the revisions to the National Curriculum at that time, but chose to deliver a controversial paper giving everyone much food for thought and ensuring a lively, and at times heated, debate for the rest of the conference. What it did was to make everyone sit up and really fight for what they believed in.

I therefore wanted taken this opportunity to present a paper that is focused on personal beliefs, developed through working for more than twenty five years in primary education. I am focusing on young children, although much of what I suggest is relevant to young people in any stage of education. I hope that John would appreciate and understand my efforts through this paper to attempt to put forward my reflections, ideas and beliefs that will add to the current debate on creativity, specifically within primary design and technology. In particular, it is my intention to consider how creativity has, and is being, developed both through a laissez-faire approach and through a more structured teaching programme. It is my hope that the lecture will provide a context for all the papers and debates that are to follow throughout the conference.

Creativity – the context

There is a wealth of literature relating to creativity, and at the present time it is an issue that is provoking much discussion. Indeed Nomura Institute, Tokyo based think tank (TES 27th Feb 2004) has identified four "ages" in the development of human society: agriculture, industry and information, now moving into creativity. Despite the rhetoric outlined in, for example, *Excellence and Enjoyment* (DfES, 2003), a review of current educational initiatives and practice, does not altogether support this view. Primary schools seem reluctant for a variety of reasons to move away from the emphasis on literacy and numeracy and to provide opportunities across the curriculum for children to engage in more open ended activity, where they are able to make their own decisions and choices, take risks, and exhibit originality.

During a recent discussion with a group of twenty primary teachers from a variety of schools in different Local Education Authorities (LEAs), one of their main concerns was their lack of real understanding about the nature of creativity. The common threads of understanding related to ensuring that the children had opportunities to "do their own thing"; "they should not be constrained by teacher input or direction"; "letting them get on with it"; "ensuring that there were plenty of materials for them to choose from"; and the idea that creativity could be developed mainly through art and music or "the arts". Obviously, a larger study would be needed to identify common understandings and misconceptions, in order that, for example, appropriate Continuing Professional Development (CPD) programmes are developed, but unless misconceptions are identified and addressed, the development of creativity will almost certainly be hindered. There has not a clear consensus relating to the issue of whether all children could be creative. Gardner (1983, 1993, 1999) expounded the "Big C" theory, suggesting that there are only certain individuals that have "high creativity", those that make a dynamic difference within their particular domain by changing knowledge. He (1997) further develops this theory, identifying four types of extraordinary creator: masters, makers, introspectors and influencers. However, others including Craft (2002) have suggested that the concept of "little c creativity" may be more helpful, particularly in relation to the education of young children today. I would agree. The idea that we all share this characteristic and can, given appropriate opportunities, show creativity, albeit in certain domains, is one that is crucial for all teachers to understand. Whilst they may have a future Picasso or Freud in their class, it is more likely that they will have children who are capable of creating something original or offering an original idea or solution that is original to themselves and not necessarily something that is totally original.

This notion is supported in *All Our Futures* (1999:29) produced by the National Advisory Committee on Creative and Cultural Education (NACCCE). Creativity is defined as:

imaginative activity so as to produce
outcomes that are both original and of value.

Originality is always a necessary factor within
creativity but different categories (Boden, 1990)
are defined, and it is only the historic category
that relates to Gardner's Big C; individual and
relative are attainable by all. The four features
of creativity identified in the definition in *All
Our Futures* (1999:29-31): "using imagination;
pursuing purposes; being original; judging
values" are at the heart of design and
technology and if taught well should provide
children with opportunities to show and
develop their creativity. If you believe that
children can be creative in different domains,
and I do, then it is imperative that children are
offered a variety of opportunities to develop
their creativity, using different contexts. If we
ignore this, then some children will be severely
disadvantaged. There is little research evidence,
but a wealth of anecdotal evidence, about
children whose achievements in design and
technology far surpass those in other areas of
the curriculum. In discussion with the group of
teachers previously identified, one teacher
highlighted what outcomes were apparent for a
child (aged eight years) who had low self-
esteem, gained results in mathematics and
English far below most in his class and found it
difficult to focus on most of the on-going work.
During a design and technology project to
design and make a money container, he
showed perseverance, ability to keep on task,
enthusiasm, the desire to talk about his work,
ask questions, and he created a money
container original to him and others, with
interesting features and a quality finish, that
fitted on a belt. Others were impressed, his self
esteem rose, and he declared "I am going to do
design and technology when I leave school".

What is disturbing is the fact that there is
little, if any, mention of design and
technology, only science and technology, in a
wide range of publications focusing on
creativity, including *All our Futures* (1999).
Why is this? In part, it can be argued that the
subject is relatively new as a discrete subject
in the curriculum, and there is still limited
understanding of the subject outside the
immediate community; this is not an excuse.
The community needs to break down barriers,
aid understanding and publish more widely;
the conference and the Proceedings will go

some way to do this, but we need to reach out
into the wider education community.

Looking back – an historical perspective

In primary education there was no identified
subject of design and technology before 1989.
However, there certainly was activity that linked
to it; there were schools in the 1970s and 1980s
that included aspects of design in their curricula;
there was art and craft; and some "topic work"
was very closely aligned to design and make
assignments. During the 1980s, I worked through
a topic on creating a new playground for the
local park. The children evaluated the existing
playground, and looked at others through
pictures. They discussed what they would like,
and what others might want. They thought
about safety issues; involved the local council;
and created a presentation of their ideas. What
they did not do was to model the playground;
think about the individual pieces of equipment;
learn about different mechanisms or mechanical,
electrical and computer control. Thinking back to
other design and make activities of the time, key
aspects that were missing were the identified
purpose and the user, crucial aspects in design
and technology and helping to provide a focus
for creative ideas.

My memories of the 1950s were of primary
schools that were hierarchical; classes that
were mostly teacher directed; children sitting
in single or double seats; little group work or
sharing of ideas; and very large classes.
Children were not encouraged to make their
own decisions and choices; materials were
very limited and were mostly given to the
children; and there was a great emphasis on
maths and English. Whilst there were some
very innovative educators: Froebel, Pezztalozi
and Steiner, together with schools based on
their philosophies; it was an era when
knowledge was identified as important and
thinking independently was not. Theorists
were still focusing on the "big C" idea of
creativity and teachers were not encouraged to
develop creativity within each child.

As we moved into the 1960s, Plowden (1967)
was the major influence on primary education.
"Child centred education" became all
important and creativity was linked to self
expression. Children were encouraged to
follow own interests; topic work at its worst

meant children experienced curricula that were devoid of clear objectives and outcomes and lacked progression and continuity. The "discovery" method, linked to child centred education was advocated so as not to stifle children's creativity and interest. Working in the West Riding of Yorkshire in the 1970s, I was able to see the work of Sir Alec Clegg at first hand. He was inspiring, however in reality, many of the primary schools were ill equipped and teachers lacked good CPD. Much of the area was struggling to overcome the depressed state of mining; many of the schools were built in the late nineteenth and early twentieth century, thus failing to provide stimulating environments in which to work. Whilst I believed that we needed to take account of the needs of the individual, classes of fifty plus, with no other adult support, hindered this in reality. The idea that children needed to discover for themselves was often taken to extremes and I felt very strongly that children needed more than self discovery to be creative. I was convinced that they needed a clear framework, relevant knowledge inputs as well as a safe environment in which they felt able to take risks without feeling failures if these did not work out. Cox and Dyson (1971) certainly expressed this view strongly and it is one that is supported in *All Our Futures* (1999). Kemp and Lane (1972), great advocates of the topic approach, provided much in the way of supporting this approach for teachers; however there was a lack of activities relating to the made world, thus missing out on contexts that were both relevant and realistic for children.

In addition, there was an emphasis on maths and English that affected the content and delivery of the primary curriculum. Whilst it was not as high profile as in the 1990s, teachers were constantly being required to gain an understanding of new methods such as Cuisenaire in maths and Look and Say versus phonics has continued to be the centre of debate until today. Whilst I would argue that the best topic work offered opportunities to develop creativity, these were not to be found in majority of primary schools, despite the change in the philosophical standpoint in the 1970s from product outcome, to creativity being connected with imaginativeness (Elliot, 1971).

During the 1980s and 1990s, research into creativity has been linked to the importance of social structures in its development. Rhyammar and Brolin (1999), Amabile (1998), Worth (2000). If we examine the development of primary education during this time, with the reconstruction of education through the introduction of a National Curriculum, the focus on maths and English, the tightened central control, the pressures of time, competition through league tables, and a climate where risk taking is not encouraged, it seems an unlikely environment in which creativity could be encouraged or flourish. Has there been a time when in reality creativity has really been fostered by the majority of schools and teachers during my teaching career? I would argue not and there is much to be done in the near future if we are to change that.

Fostering creativity within design and technology
Providing an appropriate environment
By the time a child reaches nursery, so much has already influenced his/her development. In terms of creativity, much will be dependent on the experiences provided for the child, the interests of the adults around him/her and the values that the child has already begun to acquire. If the child has not been encouraged for example, to ask questions, to investigate and explore, to take risks, to make their own decisions and choices then already their creativity may have been stifled. It is already difficult to reassure such a child that he/she is well able to be creative; that right and wrong answers are not the norm; and that there are different solutions to problems.

During the Foundation Stage it is crucial that children are given opportunities to develop their creativity, across the curriculum and in each domain. Through play, for example, they can explore the made environment. However, in many cases of projects such as Manning and Sharp (1979), there is little focus on the made environment. Indeed, reviewing work and publications relating to play there is little evidence of young children being offered such opportunities. Exceptions include the work of Ken Baynes (1994) and the recent *Developing Designerly Thinking* project (Benson, 2003). Whilst the Highscope process of working (plan, do and review) enables children to develop critical and creative thinking skills, children cannot do this within the context of the made environment unless curriculum content changes in the majority of Foundation settings.

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Moving into primary education (5-11 years), the introduction of the National Curriculum led to the belief amongst many that now it was not possible to provide a curriculum with opportunities to develop creativity. I find it depressing to see how many Heads follow a rigid curriculum, with the literacy and numeracy strategies at the heart of all timetabling. Had Heads held on to beliefs about educating the whole child, had en masse rejected the importance of the league tables, had taken what they considered good practice from the strategies, then a diverse and exciting curriculum could still have be delivered in schools. Where there are examples of Heads who have been creative in the provision of relevant curricula for their children, many are in areas of deprivation where they have seen the importance of providing the children with opportunities to develop a range of skills including creativity. Through discussion with some of these Heads it is apparent that they feel less pressure on them to secure high positions in the league tables and want to ensure that each child has a range of opportunities to develop different domains. Although recently, there has been a move to promote an integrated approach to the curriculum, to promote subjects such as design and technology (DfES, 2003; QCA, 2004), there is still no real movement to change the way in which the curriculum is delivered. Children are not being offered opportunities generally to follow their interests through well supported projects, where risk taking is promoted and valued. However, taught well, design and technology provides exactly such experiences.

Teaching and learning
Different styles of teaching are certainly being promoted today to take account of different learning styles. An analysis of any design and technology project reveals that there are opportunities for a range of teaching styles to be used: auditory, visual, kinaesthetic, but these opportunities can only be provided through careful planning and teachers who understand the different needs of children in their classes. However, whatever style is used, effective questioning is one of the key strategies that will support learning and provide stimuli for the child to take his/her thinking forward. Mortimore et al (1998) and Black et al (2002), for example, highlight the positive effects of the use of frequent questioning and the use of higher order

questions. Through the project *Developing Designerly Thinking in the Foundation Stage* (2003), findings have shown that carefully planned questioning, a framework such as Bloom's taxonomy is rarely used and the quality of questioning certainly affects the quality of the children's responses in the classroom. In addition, questioning strategies such as those outlined by Shirley Clarke (2003) are not common practice. The development of subject specific effective questioning is not a prominent area for CPD in primary education, but it is one that needs addressing.

Two key areas in the delivery of design and technology in the classroom: designing and summative evaluation, are not being taught effectively. For more than ten years, OFSTED has identifies these as areas of weakness in their annual reports and Benson (2003) indicates that the findings are similar for those in the Foundation Stage. Through design, children are given opportunities to critically evaluate the made world, gaining ideas to support them in their own work. They should have opportunities to discuss and model ideas, producing prototypes. They can trial a range of ideas, modifying them in the light of their evaluations and those of others. NACCCE (1999) indicates the importance of evaluation and through this, the development of children's critical and creative thinking skills. Again lack of understanding of the nature of these activities is a major cause of their omission; relevant CPD programmes are essential.

Knowledge and confidence of teachers
For over ten years OFSTED reports have shown that knowledge and confidence of teachers in design and technology is an area of need. If one subscribes to the notion that children have to have appropriate knowledge to enable them to be creative, Boden (2001), and I do, then teachers must have the kind of knowledge that can be used to inspire and enthuse a child. Realistic and relevant CPD can give real knowledge and confidence, the kind of knowledge that is internalised, and the teacher can then feel confident to share knowledge in an appropriate way. However if the teacher has confidence, it is possible for him/her to share a lack of knowledge with the children and investigate together. Certainly in the *Designerly Thinking* project (Benson, 2003) there is evidence to show that those teachers who had

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appropriate knowledge, elicited a wealth of ideas from the children, allowing them to question, offer evaluative comments, and use this new found knowledge in future activities.

Whilst knowledge relating to social and cultural contexts is known to play an important role, for example Feldman and Csikszentmihalyi (1994), in building self esteem and self worth, it is one that can be neglected. Many schools have taken published materials such as QCA (1998) and paid little heed to adapting the units of work to ensure that they are appropriate for the need of the children in their school. It seems improbable that a standard unit can provide a suitable context for children from different cultural and social backgrounds, living in a wide range of environments. Emphasis is placed on the adaptation of the units in the Teachers' Guide, but in reality few changes are made. However children need to have activities based on their experiences, before those rooted in other social and cultural contexts, to build up their confidence in the values that they believe in.

Timing is the penultimate issue that I want to raise in relation to teaching and learning. Little serious consideration has been given to the way in which units of work are delivered. Suggested amounts of time for a unit are provided in the QCA scheme (1998) but there has been no study to determine how different delivery patterns affects children's design and technology capability, and their ability to be creative. In the early 1990s the notion that work should be spread over a term was popular. It was felt that children then could have time to reflect on their work, to take time to plan their next step and that teachers had time to gather resources and to familiarise themselves with any areas that arose in which they felt that lacked knowledge. However, anecdotal evidence shows that patterns are changing: half a day a week for six weeks, a design and technology week (either full or half days), two or three days a term, blocked, are all used. The main criterion for the choice of pattern is based on timetabling issues rather than real evidence that it supports effective learning. In a few cases, schools do vary the timings to suit the activity. For example, blocked times are given for making, whilst generating ideas, planning and evaluating are given shorter periods of time. It can be argued that children do not reflect on their ideas over a period of time (particularly if there

are no on-going reminders), but forget what they planned and how to take the project forward; enthusiasm can wane; and half made products fall apart before completion. Designers often work to deadlines, and under a certain amount of pressure. The Channel 4 programmes showing Seymour and Powell at work and the IDEO video, shown through the Design Museum, allow us to see how creative designers can be, working in teams, discussing ideas and coming up with original solutions to problems. It is a way of working that could be emulated in the primary school, if teachers understand how to set the context for such activities.

The last issue, assessment, underpins all the issues relating to teaching and learning. Black et al (2002) reporting in Working inside the Black Box discuss the King's-Medway-Oxfordshire Formative Assessment Project (KMOFAP) where the focus was on investigating whether enhanced formative assessment produced gains in pupil achievement. Whilst this was a generic project at secondary level, it has relevance for primary design and technology in that questioning, feedback through marking, peer and self assessment and formative use of summative tests were all trialled and shown to be useful at raising standards. The planning and devising of questions and the development of strategies such as "wait time" was a particular area of weakness that was developed through CPD, and mirrors the Developing Designerly Thinking project for the Foundation Stage (Benson, 2003). When changes were made to questioning, teachers reported that the pupils were more willing and able to express and discuss their own understanding and ideas. Teachers moved from Black (2002:7):

> presenters of content to leaders of an exploration and development of ideas in which all pupils are involved.

Initial Teacher Education (ITE) and CPD opportunities

I have highlighted a number of ways in which I believe it is possible to foster creativity and the role that the teacher has to play in this. Increasingly, ITE is based around the multitude of standards that the students have to attain; curricular are becoming more narrow and rigid; and students are less likely to experience, at first hand, strategies to foster creativity during

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school practices. If the students do not understand the value of creativity, then there is less chance of them including relevant activities in their teaching, and pupils' achievements in working creatively cannot be celebrated-an important aspect in fostering the understanding of its value (QCA, 2004). CPD opportunities for teachers have tended to focus on numeracy and literacy over the last five years and therefore their thinking in the area of creativity may have gone unchallenged. Findings from the project *Developing Designerly Thinking in the Foundation Stage* (Benson, 2003) support this notion. If both students and teachers are unaware of the nature of creativity and how it might be fostered across the curriculum, there is less chance that appropriate opportunities will be provided for the children.

The growing use of Information and Communication Technology (ICT)

Over recent years there has been a rapid growth not only in the range of programs that are available for use but in the hardware that is used in school. Digital and video cameras, interactive whiteboards, control hardware, and internet access all offer children and teachers new opportunities to investigate, to share and record ideas, to trial and model ideas, to move their thinking on to incorporate previously unknown and untested ideas, both from their everyday experiences and those outside. A teacher reporting on the use of control within a project (Benson, 2004) stated:

the children were so creative: the staff have been so enthused.

The teacher had developed her own knowledge and confidence; supported the pupils in their work effectively; and saw possibilities to foster creativity. She was able to pass on this knowledge and enthusiasm to other members of staff.

Is it caught or taught?

Thinking back over my teaching experiences and those that I have observed, I am certain that there are many examples where children have "caught" creativity, in the sense that teachers have been unaware of factors that promote creativity and the value of them. Children have always shown an ability to be creative despite the lack of planned teaching to foster creativity. However, important factors such as confidence to let children move forward, to try out their

own ideas, even if planning has to be changed and knowledge is insecure are crucial. An example from the *Developing Designerly Thinking* project (Benson, 2003) exemplifies this. The teacher involved set a context for the children but felt very insecure about the knowledge that he might need to follow the project through with the children. What he was able to do was to identify his areas of insecurity but believed that what he was doing was valuable for the children and should provide opportunities for them to be creative. In fact he was able to support them with appropriate knowledge as the project developed and the children showed great abilities in being creative.

Can it be taught?

I certainly agree with Boden (1990) that knowledge and understanding and skills are important for the development of creativity. Through the provision of a teaching programme based on an understanding of the nature of creativity and how it may be fostered, offering opportunities to develop, for example, design, how things work, materials and their properties, ICT, and knowledge of the made world, then children will gain important skills and knowledge that will help children to develop their creativity. However, a highly structured taught programme that allows little exploration, investigating, questioning and risk taking is not going to promote creativity.

What I am sure of is that we must provide these opportunities in the Foundation Stage, and throughout the primary phase. It will almost certainly be too late to foster creativity for some children by the time a child reaches secondary school, if the building blocks are not in place.

I believe that children need to be given opportunities to develop their creativity within all their domains, and design and technology provides so many opportunities for this. To ignore it means that many lose rich experiences. Seltzer and Bentley (1999) promote the notion that it is vital to promote ways of embedding learning in a range of meaningful contexts, where students use their knowledge and skills creatively to make an impact on the world around them. Creativity is not just an ability that children need to really succeed at school; that is what they are going to need to succeed throughout their working lives and beyond (Ball, 1994; Hargreaves, 1994).

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