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Creativity – future challenges and rewards

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Introduction

For our journey of teaching Design and Technology creatively it's helpful to remember that both the subject (D&T) and the phenomenon (creativity) can be thought of *holistically*.

D&T's very name implies something rather richer than simply a body of knowledge or a traditional 'subject'. For a start 'design' is both noun and verb and, educationally, we are interested in both *processes* and *products*. Meanwhile Technology (big 'T') alludes to a *field of human enterprise* embracing multiple technologies (small 't'). In the classroom we don't give attention to any one technology all of the time. Rather, we move amongst them according to our educational purposes.

I'd also like to suggest that it helps to think of creativity holistically rather than as a single concept or phenomenon. Because creativity is such a rich and personally and socially beneficial educational concept, it can't usefully be approached from a narrow interpretation. There are many ways of looking at creativity and the term is used in different ways in different contexts.

By keeping these holistic approaches in mind we can better celebrate D&T's wonderful partnership with creativity and we can discover rewards and challenges that we might not have anticipated in our work. Through our D&T teaching we introduce children to opportunities for working creatively as well as to ways of understanding themselves and their ability to act on, and change, their worlds. We can also develop professionally in how we look at the curriculum and how we work creatively with colleagues. In turn, schools enhance their creative cultures as a direct result of a rich spectrum of D&T creative activity.

Taking a holistic approach, we can consider D&T's special contribution to creativity in three ways: *for* creativity, *through* creativity, and *about* creativity. Put simply, D&T can educate *for* creativity on the assumption that we are supporting the advancement of *creativity itself* as a societal good for the future. Helping children be creative (and all that this entails) becomes a contribution towards desirable futures. Educating *through* creativity is to suggest that there is a particular kind of learning that D&T education delivers through its creative practices. Here, D&T serves as a sophisticated tool to advance learning in ways that are special to the field. Education *about* creativity involves D&T helping children understand the multiple, valuable facets of creativity-as-practice. Here, children step back from creative practice to reflect on what creativity is, how it works, how to put it to work, and how to critique it.

When D&T adopts this holistic approach to creativity education it is fulfilling its role as a powerful and unique form of education and as a key contributor to general education. While some of the general education aspects of creativity may appear elsewhere in the curriculum, when D&T integrates all three ways of addressing creativity it is doing so uniquely as a form of *design and technological literacy*, that is, as education of value to every child no matter where in the world and regardless of the talents they hold. When this happens, teachers are indeed (to reflect on this book's title) teaching Design and Technology creatively.

Seeing creativity through Design and Technology

How then might we view creativity in ways that alert us to new challenges and bring us new rewards? How might we develop our special sense of D&T creativity for the benefit of the primary classroom? As this book shows, creativity is not a tangible entity – something we can touch, readily describe or even agree upon – it is a concept better understood educationally from a range of perspectives. In this next section I explore some of the ways we can see creativity through Design and Technology.

Creativity as a personal and collective good

When teachers are helping children be creative they are first and foremost supporting the individual – the person – but they are also contributing to an important social good that is of broader cultural benefit. (Of course, they'll also be nurturing the occasional creative genius too.) All researchers and scholars of creativity agree that creative capacities lie within everyone to some degree. Our educational challenge is the fostering of the individual's creativity; whether that be a matter of confidence-building, evocative questioning, playing games, or harnessing mischievous minds.

The significance of creativity to the individual; to their identity; and to their personal development is so important – not least because creativity can be understood as an aspect of consciousness - of expressing one's being. As Lubart puts it: 'Being creative is, in part, a philosophy of life, which is acquired through childhood experiences.' (Lubart, 2004:12). It is part of who we are and we have a sense of purpose when we behave creatively. Creativity matters to us as persons. It is at the personal level that creativity is both challenging and rewarding and, in this, D&T can play a major role.

Mumford (1934) argued creative activity to be a necessity of human fulfilment which should be socialised through education. That is, by helping pupils realise their creative potential they can also understand its benefits to others. Parnes (1963/1970) argued that creative activity amounts to a fulfilment of the highest of Maslow's needs – that of self-actualisation. We certainly know this from students' delight when they come up with ideas and products which, to them, are original – of their own creation. Yet, as we know from our personal experience as teachers and adults (which we bring to our pedagogy) that being creative can also be demanding, risky and emotionally challenging. To paraphrase Lubart (2004:12), creativity both *gives* to the person and *asks of* the person.

Through their designerly activities, children learn that creativity is a disposition, a behavioural tool that they can choose to use at will. When, as teachers, we treat creativity as we would literacy or numeracy it becomes part of life-as-usual, having benefits that are of rich educational value to our pupils. Better still, pupils educated about their personal and collective creative potential can apply their creativity as a *social good* for individuals, communities, societies and humankind alike. Like Mumford, Koestler (1964/1975) saw the creative life as a social one and he talked of *creative contagion* – of how creativity stimulates creativity – a concept of real value to our D&T teaching.

Florida (2003) presents his own sense of creative contagion when he witnesses the rising social significance of creativity through *the creative age*, *the creative economy*, and *the creativity index*. He describes an emergent *creative class* with two major sub-components of a 'super-creative core' and 'creative professionals' includes educators (unsurprisingly) in the former group – a rewarding professional salute but also perhaps another expectation of teachers in changing times.

The significance of designerly and technological creativity to humanity

As a species, we cannot *be* without technologies, nor they without us. Our *being* is as much technological as it is human. However, we must remember that all technologies are the result of human *design* which is implicitly creative. Remarkably, we still haven't a parallel education for these incredibly significant circumstances. However, D&T creativity education does open up multiple possibilities for teachers to explore ideas with children about evolution; how creative acts brought about life- and society-changing technologies; the place of designed technologies in historical events; and, equally, how innovations often bring new problems. Any product analysis game opens up the whole connected web of issues around who brought products into being; how they were made; who was affected by them; and what the consequences are (always a mix of the positive and negative here).

In reflecting on the history of technologies and designs, I'm reminded of classroom discussions where children consider the differences between discovery and invention (a contribution to understandings of why technology is not science). Similarly, when children discuss the differences between accident and design they are engaging in (although they may not know it) philosophical explorations of determinism, free will and questions of choice – all significant to humanity. In turn, when they are being creative they are weighing up the competing values that will constitute their design choices. They are critiquing or questioning what are the best decisions and, importantly, they are considering why. So, for our D&T teaching, two considerations for understanding the significance of creativity in, for and through D&T emerge. What is interesting is how these begin in the primary classroom yet can have far-reaching benefits – which is education at its best!

All creative and design acts are intentional acts

Creativity always has an intentional orientation – toward the future – whether that future be the immediacy of thought or a distant outcome. By whatever definition, it is about *bringing into being* ideas, designs or actual products not yet existing. Creativity is the oxygen of design activity and descriptions of creativity invariably embrace some sense of *originality*, that is, a lack of prior existence. This is why designing is often described as acting with intention on the world or changing one set of circumstances into another. Lubart (2004) talks of *conation* – the drive to act purposefully. Put differently, we entertain *motives*. Understanding creativity-as-intention celebrates Design and Technology's special contribution to educating children to apply their thinking and to enact change. In turn, we can reflect on Hannah Arendt's observation that: '... the moment we turn our mind to the future, we are no longer concerned with "objects" but with *projects*... And just as the past always presents itself to the mind in the guise of certainty, the future's main characteristic is its basic uncertainty.' (cited in Mitcham, 1994:254).

Bound up in the intentional perspective is the recognition that to design is to resist determinism – the view that all events are determined by prior events. Creativity and designing are actions of the will – intentional acts to reshape what exists into another condition. There are plenty of popular manifestations of technological determinism, for example: that technologies are 'inevitable'; that we have no say in their introduction and effects; and, 'that's progress'. So when children have opportunities to be creative, whatever the design project, we can invite them to reflect on the fact that they were the decision-makers in the process, that they can change their design decisions, and that they can also legitimately question the design decisions that others have made in their products.

By engaging in reflections on their creativity as both process and behaviour, children come to understand design as a form of empowerment in which their own decisions bring design

responsibility. They understand that design is what makes change happen in the world and that this is how the future can be engaged. Pupils' education about creativity is richest when they learn that they are consciously asserting their own will and imagination through creative, designerly acts. Furthermore, through such self-expression, risk-taking and exploring uncertainty their personal identity is shaped.

All creative and design acts involve value judgements and the consideration of consequences

Because it's not possible to talk of 'being human' or 'human being' without considering the intertwined nature of ourselves and the technologies we have (creatively) designed and developed, we have to accept that, while we might say that 'we' didn't personally design this or that technology, we are largely responsible for adopting technologies into our lives. Humanity is where it is today (personally, socially, politically, environmentally) because of our technologies and people's creative acts of design. However, it's important to know that our circumstances today are quite different from those of our forbears. We have ever-deepening awareness of our power to design, of the potential consequences of our designs, and of our potential to shape the future not just locally but globally - for better or for worse!

What does this mean for the primary classroom? As children learn that the processes and behaviours of creativity and designing are more than just 'having different ideas' (as invaluable and essential as this is) they understand that all such activity is about choice making. Choices are made to design this way, not that; even to initiate a design; and these choices are invariably dealing with questions like "What is better, or worse, here?"

By weighing up design variables children commit to value judgements. 'Costs' might be financial, personal, social, human, environmental, aesthetic and so on. Designing is eternally about compromise and children soon learn that not everyone or every criterion can be satisfied. So, in deciding to act this way or that, when invited to explain their decisions they have to articulate their thinking in ways that, sooner or later, are ethical in nature (Keirl, 2011). They are formulating ideas about what counts as right, where 'right' has multiple senses. The value judgements that are forever arising in creative designing are interwoven with ideas of good-bad, better-worse and the consideration of alternatives. Here we have creativity in its rich D&T sense extending into the moral world and, with this, imagination, critical thinking and reflection are all developed. Along with good D&T creativity comes the recognition of a spectrum of consequences – from meeting a brief to imagining differing kinds of effects and outcomes. When we (and children) understand that we are all part of ongoing change, we are the future we contribute to, and that we are choice-makers then we understand something of identity, of responsibility, and of shared futures. (McLaren, 2012)

Creativity in D&T: some inhibitors

Just because we might accept and advocate creative Design and Technology as an educational good, that is no guarantee of its ready acceptance into the curriculum. It would be naïve not to proceed without bearing in mind the kinds of things that can inhibit our good intentions.

I'll start by asking that we remember that there is a political context to our work as teachers. I am under no illusions whatsoever about the pressures under which many teachers are expected to work and that any curriculum innovation can seem daunting. Ours is a profession forever full of contradictions and tensions and many of these come from beyond our classrooms. In countries such as England teachers are constrained in their work by bureaucratic demands and testing regimes that induce particular professional and school cultures. These demands and regimes don't just happen. They are themselves intentional

political acts - designed technologies. They are telling of how schools are viewed and of how some believe children should be treated.

In 1972, the seminal work of Paolo Freire illuminated a major contradiction in the ways in which children were seen by educational systems. He offered a creative curriculum analysis that resonated globally and continues to remind us of educational alternatives today. His landmark pedagogical critique famously contrasted 'banking education' (system-centred with education intentionally restricted to facts and prescribed knowledge) with 'problem-posing education' (pupil- and teacher-centred with education as engagement with the world).

Banking education treats students as objects of assistance; problem-posing education makes them *critical thinkers*. Banking education *inhibits creativity* and domesticates (although it cannot completely destroy) the *intentionality of consciousness* by isolating consciousness from the world, thereby denying people their ontological and historical vocation of *becoming more fully human*. Problem-posing education bases itself on *creativity* and stimulates true *reflection* and *action upon reality*, thereby responding to the vocation of *persons as beings* only when engaged in *inquiry* and *creative transformation*. (Freire, 1972:56. My italics)

I hope the spirit of this rich quotation is evident. For our subject, the 'Design' in Design and Technology is ever in danger of being marginalised as simply drawing and reproductive skilling (a particular challenge for secondary school colleagues) or it is rendered invisible by educationally divisive trends such as STEM (a shelf-ready acronym for neatly packaged humanities-marginalising Science, Technology, Engineering and Maths). Meanwhile, the 'Technology' in Design and Technology meets the banking formulation when the subject is reduced to making children only passively aware of technologies and how to use them, that is, enculturation into the uncritical acceptance of technologies. In the circumstances I describe here, creativity is seriously inhibited.

When there is a dominant bureaucratic climate (which takes professional judgement away from teachers) and testing (rather than *assessment*) regimes then it is the system's needs that are being privileged. Creativity and creative teaching cannot flourish in such climates. My point here is that whatever our sense of 'creativity', it can be compromised by educational straitjackets. Thus, probably our single greatest challenge regarding education for, through and about creativity is how to enact it. Perhaps we can help usurp the status quo by taking up our book's invitation to *teach Design and Technology creatively*. At least, for now, D&T can enjoy life outside of testing regimes even though as a consequence of the pull on resources that the regimes demand, D&T loses its educationally defensible place in a rich and necessary curriculum for all primary pupils.

Thus, there can be organisational challenges for teachers intent on celebrating creativity in the classroom. Here, I'm referring to that fact that it is very hard for a few teachers to try to teach creativity, and to teach creatively, when the school as a whole doesn't (or can't) celebrate creativity. For creativity and creative contagion to flourish, a *culture of creativity* is needed and this is matter of leadership and whole-school commitment. Florida (2003) observes that '... perhaps the biggest issue at stake in this emerging (creative) age is the ongoing tension between creativity and organization.' (Florida 2003:21-22). Such is the case for schools.

Just as there are human traits relating to creative behaviours and cultures so there are organisational ones too. Creative organisations facilitate creativity positively. Others pay only lip service to creativity; feel threatened by it; or, actively discourage it. Creativity can thrive when: risk-taking is welcomed; negativity and blame are combated; bureaucratisation and administrivia are minimised; vision is maintained; and, spoon-feeding is avoided. In other words, professional independence and judgement allow for imagination and creativity to

flourish. However, while there are some serious systemic issues to consider when seeking to enhance creativity in primary schools, we need not be pessimistic on the D&T front.

Interest in creativity ‘for productivity’ with an accompanying educational agenda boomed massively in the 1960s – not least as a result of one international superpower feeling it was technologically ‘falling behind’ the other. At that time Parnes (1963/1970) reported research predicting that, in teaching: ‘...there will be less emphasis on memory and more on creative thinking.’ Commenting on the rapid expansion of knowledge and increasing pace of change (even then!) he noted the impossibility of predicting what knowledge would serve society best in a decade’s time. Consequently, he advocated the development of ‘...the attitudes and abilities that will help (people) meet *any* future problem creatively and inventively.’ (Parnes, 1963/1970:351). Despite this earnest foresight and considerable growth in creative education in schools through the 1970s, nearly fifty years on, this hope remains unfulfilled in today’s content- and test-driven curricula. However, history and optimism both tell us that creativity and creative education are ripe for renaissance in our primary schools and it is possible that we are witnessing the cusp of change for the better right now. The (political) curriculum pendulum may well swing back and Design and Technology can rightfully contribute to the momentum.

Creativity’s co-conspirators

While we can see how richly creativity-through-D&T plays into the general curriculum as well as being a distinct subject, we should also consider a group of concepts that relate to, or qualify, our sense of creativity. I mention these because I believe they are suggestive of possibilities when teaching creativity through D&T. While we can think of creativity as design’s oxygen it does not *equate* design (which can be noun and/or verb). Besides, creativity is just one of many approaches that design embraces for its purposes.

Some concepts such as *idealism*, *empathy*, *curiosity*, *apathy* (as a social condition) and *boredom* (a personal one) can provide an entry-point for creativity and can inform creative practices. Much in life can be lived with an orientation toward the *ideal*, that is, perpetually sought-after, never-to-be-attained and ever reimagined yet ethically defensible. For me, democracy is an example of this. *Empathy* is something about which children learn, that contributes to their development and from such a trait come creative design opportunities.

Curiosity has ever inspired creativity and can be considered one of life’s motivators raising questions that beg invention, new thinking and alternatives – remembering that Pandora’s curiosity left us with innumerable problems too! Creativity can serve as reagent to *apathy* and *boredom* and, for children, builds both agency and confidence. In the classroom, we can often witness mischief as a behaviour of the intelligent, creative, yet bored, child.

Differently, creativity’s major co-conspirator is *imagination* whether imagining big-picture as in future possibilities (the foresight of Prometheus or the invitation of John Lennon) or in the detailed workings of the mind’s eye when ‘building’ something inside the head. We are also witnessing the emergence of *critiquing* as a powerful component of D&T practice. The South Australian curriculum of 2001 led the way with this innovation but it’s educational power must be well managed. Critiquing is an invaluable practice in the weighing of value judgements in design decision-making and in questioning design intentions. However, it must never be allowed to inhibit the imagination (Keirl, 2004). It helps to remember that, while creativity and designing are *proactive* (they look to the future), critiquing is *reactive* something (a thought event, or act) has to have happened before it can take place.

D&T as creativity in action – rewarding children, teachers, schools, *and* society

Having explored some of the many ways that creativity interplays with the designed and technological world, how might we consider its rewarding relationships with Design and Technology in the primary classroom?

For D&T to realise its potential as mainstay of creativity education it should, I argue, be seen as *both* design- and technological-literacy *and* as a subject of special and unique educational focus. The former celebrates Design and Technology's well-recognised capacities for integrating the primary curriculum and to act as a catalyst for all kinds of learning. We have long known that almost any learning style or (multiple) intelligence, no matter whether head, hands or heart, can be 'hooked' and enhanced through D&T. The situation regarding creativity is no different.

Design and Technology education, with the rich creativity it facilitates, is of value to children everywhere. Wherever they live, children are born into a particular set of technological circumstances and a good D&T education helps them see that those circumstances are transient and malleable. For Design and Technology to flourish, I'd like to suggest we remember:

- that we think of creativity holistically, that is: *for* advancing creativity in general; *through* creativity as an agent of design practices; and, *about* creativity as a topic of learning itself;
- that there is a symbiotic arrangement between creativity and D&T – through their practice, each enhances the other;
- that creativity is viewed not as a singular entity or process but always as part of a greater context;
- that creativity is viewed ethically for the value judgements that are made during the creative process and for the consequences of its products;
- that creativity is for all – whether as personal fulfilment or as societal good (or ill!)
- that a creative classroom environment is essential and a creative school culture is very important. Creativity must be seen to be valued by all in the school.

D&T teachers as creativity's co-conspirators

Clearly, where an imbalanced or heavily tested curriculum drains resources (human, temporal and other) and a school finds it challenging to celebrate creativity (for whatever reason) then it's not easy for teachers to do so either. However, because D&T enjoys a symbiotic relationship with creativity, so long as it maintains its place in the curriculum then it will fly creativity's flag. Thus, as ever, the teacher is pivotal to the successful engagement of children's creativity. What professional assets do we have to counter the challenges?

First, we can champion D&T's huge educational potential a) for all learners no matter the learning preference; b) as curriculum integrator to bring meaning to learning through design activity and practical engagements that contextualise other fields; c) as a forum for action-on-the-world and of identity formation; d) as a forum for the expression and realisation of designerly thinking; e) as a forum for debating and critiquing existing technologies and products; f) as a special way of seeing and understanding one's world and those of other cultures and communities; and g) as a place for considering futures and change positively and with optimism. Design and Technology can be thought of as a way of doing, thinking, knowing, creating and being. If it is fostered and celebrated by schools then the school's creative culture will blossom too.

In a perverse way, we can also take strength from the fact that, because D&T is not encumbered (at least directly) by testing regimes, it is reasonably free to get on with its very

special form of education. Whatever the situation, D&T has excellent educational credentials *of its own right*. Whoever seeks to marginalise it is usually coming from a particular, narrow and/or dated educational stance. Many curriculum decision-makers have not had the benefit of a rich D&T education so are ill-equipped to make those decisions.

Second, we can act collegially. Freire (1972) saw curriculum as a dialogue to be created and re-created. It helps to remember that we educators inhabit curricula and that we can modify our environments – that is the way of things, to design and to redesign as an articulate professional group. I see curriculum as I see democracy – as an ideal always in need of re-creation and reconceptualisation – and the required ongoing dialogue happens better in ‘professional learning communities’ than in ‘performance training sects’ (Hargreaves, 2003). There is a need to resist having to work alone and to work in the immediate (two deliberate pressures on the profession in many jurisdictions). Working together and with vision facilitates stronger change than seeking isolated quick fixes as curriculum development.

Third, teachers’ professional judgment is a double strength – collectively and individually. Collegial action can be political (small-p) in that it is both strategic and it enables resistance to the “schools should” brigade – all those ‘experts’ who ‘know’ what we should be doing – especially regarding creativity. If teachers are to be role models for creative learners then their understandings both of creativity and of their students need to be rich and carefully integrated as research-informed pedagogy. ‘Creativity as personal fulfilment’ can come to children and teachers alike even when competing values have to be met and resolved as part of the pedagogical journey. Teachers can indeed celebrate their worth as members of Florida’s (2003) ‘super-creative core’ of the creative class.

When Lubart (2004) reports his UNESCO research he is reporting on the creative curriculum *in general* noting that teachers:

...encourage independent learning, have a co-operative teaching style, motivate students to learn (useful facts as a basis) for divergent thinking, encourage flexible thinking, delay judging students’ ideas until they have been fully considered, promote self-evaluation of ideas, take students’ questions and suggestions seriously, offer opportunities to work with a variety of materials in varied conditions, and help students to cope with frustration and failure in order to build the courage to pursue new ideas. (Lubart, 2004:13)

What is interesting (and ironic) here is that this is business-as-usual for Design and Technology education. It cannot be emphasised too strongly that if teachers and schools are practising good D&T education then they will be delivering good creativity education. Teachers of D&T are celebrants of designerly behaviours; they seek creative contagion in their children and their schools. Fun plays a key role in the learning. Multiple intelligences are well celebrated through D&T learning and multiple creativities can be too. Mischief can play a part, as can anarchic thinking. Here, children can articulate imagination; be creative; bring ideas into reality; think and work towards preferred futures; creatively critique their work, the work of others, and the designs and technologies that constitute their worlds; they can gain fulfilment and develop identity; they can celebrate and explore the interdependence of people and technologies and cultures; they learn about value judgements and ethics.

Having done all such things and more, children have learned *for* creativity, *through* creativity and *about* creativity. They too, are creative co-conspirators for better worlds – a journey affording nothing but continuous challenges and rewards.

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