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# ***Childhood in a Digital Age: creative challenges for educational futures<sup>1</sup>***

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## **Abstract<sup>1</sup>**

The early 21<sup>st</sup> century is characterised by rapid change. Commentators note how permeating digital technologies engage increasing numbers of children, young people and adults as consumers and also producers. In the shifting technological landscape, childhood and youth are changing. Connectivity around the clock, with a parallel existence in virtual space, is seamlessly integrated with actual lives. Young people are skilful collaborators, navigating digital gaming and social networking with ease, capably generating and manipulating content, experimenting virtually with versions of their 'social face'. They are implicit, inherent and immersed consumers. They are digital *possibility thinkers* posing 'what if?' questions and engaging in 'as if' activity. This paper seeks to theorise such possibility thinking in a digital, marketized age, using two competing discourses: young people as vulnerable and at risk; or alternatively as capable and potent. The former perspective imbues anxiety about the digital revolution; the latter embraces it as exciting and enabling. As education providers seek to re-imagine themselves, neither is sufficient. Local and global challenge and change urgently demand our creative potential and wisdom, recognising three further key characteristics of changing childhood and youth: pluralities, playfulness, and participation. Drawing from work with schools, the paper argues for co-creating with students, education futures through dialogue to nurture the 4 p's: plurality, playfulness, participation and possibilities.

**Key words:** changing childhoods, 4 P's, educational futures, creativity in education

## **Introduction**

This article seeks to explore and bring together two sets of ideas; those around the nature of childhood and youth in a digitally-connected world and the other set to do with what this might mean for educational futures. Each of these narratives is well-recognised by anyone interested in the future of learning (eg Law *et al*, 2011) but this paper looks to discuss perspectives on childhood and youth which may inform educational provision.

The early 21st century is in part characterised by rapid and often unpredictable change; this is a global picture, with multiple indicators (tracked, for example, in relation to development, World Bank, 2011). Encompassing both growth and collapse in local and regional economies with a global impact, also the effects of globalisation and associated values on

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<sup>1</sup> This paper has been developed from a keynote given at NUI Galway in the summer of 2010, in turn based on a book by the author, *Creativity and Education Futures: Learning in a Digital Age* (Trentham).

the world's fragile ecosystem, also the rise of fundamentalism and spread of belief-based conflict, not to mention vast natural disasters from drought to tsunamis. The early 21<sup>st</sup> century seems to be a time of what might be called immense human over-confidence alongside increasingly instability in the economy, social structures, beliefs and environment (eg Craft, 2011, Facer *et al*, 2011).

Permeating our experience of each of these above-mentioned dimensions of change, is the rapidly extending reach of digital technology, transforming lives through virtually ubiquitous access to the internet through mobile phones, laptop computers, gaming devices, and other technology, much of it pocket-sized as Sharples and others illustrate (Sharples *et al*, 2005).

And as the technological landscape changes, childhood and youth, too, transform. Children and young people are increasingly connected around the clock, and have a parallel existence in virtual space, seamlessly integrated with their actual lives. They are skilful collaborators, capable of knowledge-making as well as information-seeking. They engage in social networks, they navigate digital gaming and they generate and manipulate digital content. They experiment in new ways with forms of their own social face.

All of this comes with both freedoms and dangers, opportunities and risks as tracked by the Good Play study at Harvard University's Project Zero (James *et al*, 2009). The interactions between people and non-human technology generate a potent network, as explored by Callon (1986), Latour (2005) and Law (1987) in their actor-network theory. The efforts of this paper are delineated by their focus on the social more than the non-human dimensions of the digital technological phenomenon in children's lives.

## **Changing childhood and youth**

The changing nature of childhood and youth has been traced back by Postman (1983) to the introduction of television which punctured a Western post-World War Two 'institutional cocooning' perspective on childhood (Lee, 2001: 155). Cocooning was, according to Cunningham (1995, 2006), characterised by the home taking precedence as the cradle of childhood, as children moved away from taking on an economic role. As children's lives were more confined to the home, this place began to take on protective characteristics which according to Lee (2001) underpinned its function as a cocoon.

The family was increasingly protected by the introduction of the Welfare State following the Beveridge Report (1942) which aimed to provide some support to families in facing five challenges facing society at the time, namely disease, ignorance, want, squalor and idleness. The Welfare State introduced to families education, health and social welfare services which were all free at the point of delivery funded through compulsory flat-rate insurance contributions. Open to all, it guaranteed a minimum standard of living for families and offered much greater security in face of unemployment, sickness, bereavement and old age. Cocooning was thus facilitated by such State support, and was also enabled by economic boom which led initially to distinction in gender roles with men earning their living outside the home and women on the whole responsible for making the home and raising children. Despite evidence (Joshie and Hinde, 1993) based on data starting in 1946 that by the 1990s increasing women were economically active beyond the home after having children, in part made possible as Hakim (2000) notes by improvement of contraception, revolution in equal opportunities, expansion of non-manual work and increasingly potential of employment not seen to be defining of identity there is nevertheless evidence (eg Voydanoff, 1988) that women continued to predominantly preside over the home, and childhood, into the late 20th century even where gender roles were shared (Thompson and Walker, 1989).

Thus, the home was characterised over the period following the introduction of the Welfare State, as safe. Although, moving into the twenty-first century, the boundaries of the home are increasingly permeable in many ways as discussed throughout this article, the home

continues to be idealised as a place of safety, especially and perhaps unsurprisingly by children (Harden, 2000); intriguing given evidence from medical health, psychology and social research for example of social, economic, psychological and physical dangers which can place children at risk.

Secondly, post-World War Two domestic life in the West acquired mystique; this is linked by Lee (2001) to patriarchal reproduction where women's power and sexuality were repressed by their reproductive and domestic responsibilities. Children were raised in the secret space of the home over which women held dominion. Childhood was, therefore, tangled in the mystique and secrecy of a world presided over primarily by women.

Finally, the Western home, post World-War Two, was, according to Lee (2001), secret. Protected from adults children were distinct from the grown-ups and were cocooned from the economic, social and technological world beyond the home. For although labour-saving technology (such as vacuum cleaners, washing machines and food blenders) was increasingly part of the post-war home of the 1940s and 1950s this was focused around making the work of looking after children and a home less onerous and meant less need for children to help out. The effect of the technology was that children's lives were increasingly distinct from those of adults.

One of the features of the cocooning period, was the tendency to view children and childhood through the 'layer of adults' (Lee 2001:155). According to Postman (1983), this positioning of children changed radically through the introduction of television from the 1950's. A means of mass-communication, television brought the wider world and most significantly the marketplace, to children in their homes and therefore began as the seminal study by Himmelweit *et al* confirms (1958), to empower children as consumers in a changing (increasingly globalised) economy. This article takes up the theme of children as consumers, exploring what this narrative means in relation to digital media in children's lives. The marketing of childhood is now embedded in multiple new digital media (Livingstone, 2003) the nature of which enables children not only to consume but also to produce in relation to the marketplace and thus to influence the direction of market growth and change. By the end of the 20<sup>th</sup> century, children were engaging directly with the global community and in particular marketplace, often from within their homes, yet in highly personal ways.

### **The marketized child and family**

For Lash and Urry (1994) this reach of market dynamics deep into the life and identity of the family, is symbolic of the era of 'high modernity' characterised by a powerful and uncritical belief in grand narratives of 'progress' which include the global capitalist marketplace. The family, childhood and youth in the early 21st century can therefore be seen as harnessed deeply toward promoting the globalised economy<sup>2</sup>. This is overtly signalled in strategy documents such as the Europe 2020 strategy (European Commission, 2010), which sets out a set of initiatives to nurture European economic competitiveness. One of the seven flagship initiatives set out in the document is focused on promoting digital literacy and capability by all European citizens.

One effect of the reach of the globalised economy into the home, is that children and families are increasingly constructed by the globalised economic context, as active consumers, or economically aspirational. Alongside ever-decreasing certitudes in social and emotional narratives together with ever-increasing geographical mobility, demographic and intergenerational change, this means increased pressure on children and their families to make sense of and choices about how to navigate the complex possibilities facing them (Craft, 2005). Beck (1992) writes of the individuation inherent on choosing courses of

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<sup>2</sup> Given interdependence of economies through globalisation and increased complexity of relationships between state and private enterprise following the 2008 banking failure-fuelled global recession, this relationship between children and wider economy is sophisticated (Craft, 2011).

action, Buchner (1990) of the 'biographisation of the lifecourse' (p78). It seems indisputable that unprecedented social and economic upheaval, environmental and fundamental(ist) belief change, mean an assumption of aspiration toward what Maslow (1987) called 'self-actualisation' (being able to creatively make something of one's personal and wider identity and thus pathway through life) is characteristic of Western 21<sup>st</sup> century family life (Craft, 2011).

This paper argues that such self-actualisation of the child and family in a marketized context whilst triggered by television, is further expanded by the growth of digital media; a global, inf unequal, phenomenon as noted by OECD (2008) which expands speed of access and modes of transformation into knowledge, with massive implications for education across the world. With access to digital media in and beyond the home from a young age (Vandewater *et al*, 2007, report nearly a third of 5 and 6 year olds using a computer for 50 minutes on a typical day, for example) and with increasing access to mobile hand-held devices, children and young people are now able to develop a sense of identity, meaning, direction, and even lifecourse progress, through local and global, actual and virtual engagement with others. Use of digital tools (which often facilitate a more developed sense of agency than in a face-to-face context) means children and young people are greatly empowered (i.e. with far greater personally-derived and controlled agency) compared with their counterparts fifty years ago. Children alongside adults are able to access the same information thousands of miles apart, a phenomenon Friedman (2005, 2007) refers to as a particular kind of 'flattening' of the world in a global marketplace which is only possible because of widespread personal access to mobile computers, the development of software enabling computers to talk to each other and the overall infrastructure of the web. Friedman's concept of flattening though can of course be challenged to a degree in that studies show that digital access is not flat – and there are of course other variables such as socio-economic status which may compromise equitable engagement (eg Wei and Blanks Hindman, 2011).

The argument made in this paper does not seek to reflect a technologically determinist perspective, rather it has something in common with Feenberg's (1999) perspective on the "radical political roots" (pxvi) of technology. Nor does it accept a marketized perspective on childhood as necessarily desirable. It seeks to further theorise childhood and youth as the social context of co-constructive innovation in the vein of work by Bijker (1995) and Pinch and Bijker (1987) to understand the 'technological frame' ie the social embeddedness of technology and technology-related behaviour. In doing so it seeks to reveal and problematise perspectives on childhood and youth as market-driven and determined.

## **Contrasting discourses on childhood and youth**

It would seem, then, that children and young people are greatly empowered compared with their fifty-years-ago counterparts. Yet the views of analysts exploring the nature of Western childhood and youth from the late 20th century into the 21<sup>st</sup>, cluster around two contrasting worldviews, which can be viewed as a continuum. At one extreme is a view of the child as being at risk (Frechette, 2006) where the role of the adult is primarily to protect. At the other end of the continuum, by contrast, the child is seen as empowered, the role of the adult more marginal, the child seen as effectively moving beyond adult control (Newburn, 1996). Whilst it is acknowledged that of course both elements are to a degree present in children's lives, the narrative or discourse which frames adults' actions may be driven by one set of ideas more than the other.

***Childhood at risk:*** this perspective emphasises inherent vulnerabilities in childhood (Cordes and Miller, 2000), responsibilities of adults to prepare young people for future work (Buckingham, 2007) and dangers of disenchantment (Facer *et al*, 2001a). Such perspectives can be seen, as Frechette (2006) notes, as exploiting parental fears, and as guiding parents to centring children's social lives in the home rather than in public spaces (Valentine and McKendrick, 1998). These perspectives are

perhaps reinforced by a situation where, in Western societies, formal education has been extended to late teens and even beyond given economic uncertainty, delaying traditional milestones of adulthood, such as financial and domestic independence, (France, 2007, Jones, 2008).

**Childhood empowered:** In contrast this perspective acknowledges the empowerment inherent in youth, emphasising liberation of the child, significance of preparing young people to be future workers (Buckingham, 2007), and the ‘techno-savvy’ dimension of childhood and youth (Buckingham, 2007:84) as children escaping control by adults (Newburn, 1996). Perspectives on childhood and youth as empowered are frequently tied to marketized views of childhood following Postman’s (1998) analysis introduced above, television initially linking them to the increasingly global marketplace. This marketization of childhood where children’s independence, self-identity and engagement in consumer culture form key dimensions of their lives, applies to younger children as documented by Livingstone’s (2003) pan-European study and increasingly mediated by digital technologies. And the pervasiveness of digital connectivity in children’s lives, means that 21<sup>st</sup> century childhood is, Livingstone (2009) argues, necessarily characterised by a much greater sense of personal agency.

These two dominant and competing discourses, brought together and summarised in Fig I, offer contrasting narratives about the nature of childhood and youth together with the values implied within them; these are linked with wider narratives of protecting vs empowering further discussed in Craft, 2011.

<b>Youth at risk</b>	<b>Youth as capable</b>
<b>Vulnerability</b> Consumers through adults Young people as passive Young people as novices Play as ‘private’	<b>Liberation</b> Producers and consumers Young people as active Young people as capable Play as ‘public’
<b>PROTECT</b>	<b>EMPOWER</b>
Continue Hierarchy Closed Fearful Absolute/Fixed	Develop Co-participative Open Brave Fluid/Counter

**Fig I: narratives of childhood and youth and implied values**

The growth of digital media is central to each of these narratives; one rejecting the rapidly advancing role of digital media in children’s lives and the other embracing it. In the USA, for example, the Pew Internet Survey (Lenhart *et al*, 2007) reported that by 2007 more than half of 12-17 year olds were using social networking sites and that by the end of that year, 93% of teens were using the internet with 64% of those generating their own content, and 55% having a social networking site profile. By September 2009 Pew were reporting (Lenhart *et al*, 2010) that 73% of online 12-17 year olds in the USA, were using social networking sites with older teens more likely to report using online social networks than younger teens (82% of online 14-17 year olds using social networks compared with just over half of 12-13 year olds acknowledging such use – the latter numbers possibly masked by official though non-enforced age restrictions). This later survey also showed that teens who go online daily are more likely to use social networking, 80% compared with those who go online less frequently. Teens from lower income families were more likely to use social networking than teens from wealthier homes (80% of those from poorer households as compared with 70% of those from better off homes). Gender differences in usages by 2009 had been eliminated.

Content creation, sharing and re-mixing among teens continued to rise according to the same survey, to around about 40%.

A more recent study of 8-18 year olds, also in the USA concluded that each day, school-aged children spend on average nearly 8 hours of exposure to media into 5 and a half hour of time (frequently multi-tasking for example television with a laptop, phone or hand held gaming device) (Rideout *et al*, 2010).

Given how pervasive digital technologies are in children's lives, looking beyond the polarised positions outlined above, educators in particular might do well to ask what mobile and fixed digital technology enable children and young people to engage in. Aside from offering entertainment (eg listening to music, re-visiting broadcasts and enjoying a movie), as I argue elsewhere (Craft, 2011) digital technology enables:

- Networking and communications (eg through mobile phone, online forums, skype or msn communications media or social networking sites)
- Gaming (either computer or console-based)
- Generating and uploading content (such as music, film, still images, text, within forums, games and open sites such as you-tube)

Other taxonomies of children's behaviours enabled by digital technologies are offered elsewhere, for example James *et al* (2009) who consider ethical dilemmas raised by digital technologies, refer to roles enabled by digital media as self-expression/identity experimentation, social networking, consumption and entertainment, educating/learning, knowledge-building and dialogue/civic engagement. The three umbrella terms used in this paper draw on Craft (2011) seeking to synthesise some informal dimensions of children's digital lives and serve to highlight activity rather than roles.

What each of these three kinds of activity share in common is children behaving creatively as 'possibility thinkers' (Craft, 2001, 2010), generating new realities, through asking 'what if?' and imagining 'what if'. The complexity of Possibility Thinking (PT) as a theory of creativity from a taxonomy of question-posing and question-responding, and their inter-relationship with for example imagination, risk-taking, self-determination and immersion, as well as exploring pedagogical strategies which seem to enable PT has been extensively researched and reported on elsewhere (eg Burnard *et al*, 2006, Cremin *et al*, 2006, Clack, 2011, Craft *et al*, 2012, Lin, 2010, 2011) in the context of the curriculum but not yet in relation to digital engagement.

Applying adult narratives to learning in a digital age frames how possibility thinking is understood. A 'childhood at risk' perspective worries that children and young people may generate inappropriate possibilities through networking, gaming and generating their own content. Given the assumption that young people are vulnerable and should be protected, this perspective would suggest that they need to be protected from themselves and others. By contrast, a 'childhood as empowered' perspective would welcome the multi-layered opportunities offered through digital media. There are, then, two clearly competing discourses: young people as vulnerable and at risk; or alternatively as capable and potent. The former perspective imbues anxiety about the digital revolution; the latter embraces it as exciting and enabling.

The need to recognise one's narrative as an educator is increasingly pressing. For the digital landscape to children's lives which co-exists alongside the actual, is profoundly changing childhood and youth as argued so far and so naturally is changing the ways in which educators can and need to engage with young people, demanding greater professional flexibility at a time when it could be argued greater creativity is desperately needed in educational provision (Chappell *et al*, 2011).

The case for developing creative approaches to education and enabling student creativity through educational provision, has become a widespread impetus across the world (Craft, 2005, 2011). This has been fanned by three major drivers of economic, social and technological change. In addition, spiritual and religious change and the rise of fundamentalism linked with global terrorism and anti-capitalism in some parts of the world, demand greater imagination to engage appropriately with global capitalism and thus to respond both wisely and creatively through education to its impact (Claxton *et al*, 2008). It has been argued that this sort of wise creativity can be productively developed in education through the arts which offer and enable what Chappell *et al* (2012) call 'wise, humanising creativity' (drawing on Chappell, 2006, 2008, Claxton *et al*, 2008 and Craft, 2005). Wise, humanising creativity is 'grounded in a reciprocal relationship between the collaborative generation of new ideas and identities, fuelled by dialogues between the participants and the world outside... an antidote to marketized and individualised creativity, to the performativity agenda and to notions of childhood at risk' (p9). Wise, humanising creativity is guided by ethical action, is mindful of its consequences and is 'rigorous, risky and empowering.... [offering] far greater shared hope for the future than the competitive sink or swim mentality which currently pervades our education system' (*ibid*, p9).

Such wise, humanising creativity stands in tension with the universalised version of creativity (Jeffrey and Craft, 2001) harnessed to the global capitalist marketplace, offering a 'quiet revolution' (Chappell *et al*, 2012 p150) that provokes other pathways. Wise, humanising creativity broadens perspectives on the purposes of education and problematizes the marketization of childhood and youth. Chappell *et al* argue 'education needs to be imbued with greater creativity, communality, humanity, empowerment and negotiation' (p158) suggesting, building on Craft (2005) that 'uncritical belief in [economic] growth and progress is mistaken' (Chappell *et al*, 2011, p158).

Developing wise, humanising creativity that challenges the status quo through and within the educational system demands everyday, or little c creativity (Craft, 2000, 2002, 2005, Beghetto and Kaufman, 2007) as distinct from world-changing big c creativity, together with professional creativity (or, as Beghetto and Kaufman, 2009, have it). Inherent in the valuing of everyday creativity in and through education, is the tension with the wider performative discourse globally (Ball, 2003) where students' formal achievements, measured through formal test and examination results reflect on their teachers and schools, acting as a (and perhaps 'the') key arbiter of educational quality. The co-existence of creativity policies (emphasising flexibility, imagination, ingenuity) alongside performative ones (emphasising lack of trust in favour of technicist and marketized approaches) has been well documented (eg Boyd, 2005; Jeffrey, 2003; Jeffrey and Woods, 1998, 2003, Nicholl and McLellan, 2008; Simmons and Thomson, 2008; Troman, 2008; Clouder *et al*, 2008; McWilliam and Haukka, 2008; Burnard and White, 2008).

The disconnect between creativity and performativity agendas which both affect education, is all the more jarring when set in the context of how childhood and youth is changing in a digital world, in ways that are imbued with creativity and which therefore demand imaginative, open and responsible approaches from educators. As I argue elsewhere (Craft, 2011), four key features of changing childhood and youth inherent in the digital revolution can be seen, as: "**plurality of identities** (people, places, activities, literacies), **possibility-awareness** (of what might be invented, of access options, of learning by doing and of active engagement), **playfulness of engagement** (the exploratory drive) and **participation** (all welcome through democratic, dialogic voice)" (Craft, 2011, p33).

Given the situating of the four P's of digital childhood and youth in between creative and performative agendas for education, the reader may detect echoes of the four P's framework for creativity proposed by Rhodes (1961) which recognised the characteristics of the creative person, process, product and 'press' i.e. environment. Whilst Rhodes' four P's may be inherent to the four P's of digital childhood and youth, the analysis offered here is not



intended to interface directly with Rhodes' work although it could be understood as a commentary on the processes of creativity enabled in digital childhood and youth.

## Four P's of digital childhood

Unpacking these four P's a little further, they can be seen as inherent to digitally-connected childhood and youth, and each has implications for narratives of childhood and youth and therefore for how education may respond. This analysis of the four P's draw on Prensky's observations in 2010 (a and b) that Generation Y – sometimes referred to as 'digital natives' (children born since 1980) experience different ways of knowing and playing than Generation X (born before 1980). Whilst Prensky's work has been critiqued (eg Bennett *et al*, 2008) for example for over-generalised and unsubstantiated claims for the tendency toward digital use and of different learning preferences among younger learners, and also for claims of learning through enjoyment in gaming contexts, the analysis offered in this paper seeks to provide a lens on key dimensions of digital childhood.

The four P's articulated here also draw on arguments made by analysts such as Greenberg and Weber (2008) about the digital propensity of 'Millennials' (those born since 2000), which emphasise what digital capability makes possible for many young people. The analysis which follows is offered not as an argument for technological determinism but rather in the spirit of better understanding children's lives and the implications for educators.

**Pluralities:** the virtual dimension to children's lives offers opportunities to engage and experiment with *places* to play, socialise and create, *people* to engage with and *activities* to participate in. *Extended literacies* (for example, with a greater focus on the visual) which are both possible and demanded in a digital medium enable exploration of other and multiple personal identities. Each of these pluralities inherent in the digital context of children's lives, invites the posing of 'what if?' questions and also engagement in 'as if' behaviours. As Wegerif (2007) points out, digital space offers a dialogic medium for playing and learning which as Frasca (2003) notes, produce complex, reflective understandings in a community not often found offline. These pluralities are, then, dynamic. The dynamics exhibited in digital virtual spaces are characterised by Molesworth and Denegri-Knott (2005), as 'liminal'. Offering indeterminate, open, ambiguous opportunities, they enable transition between states or existential planes, and as such they argue that digital spaces provide arenas for shifts in culture.

**Playfulness:** in the varied online contexts they can inhabit, children and young people experience expansion of play worlds into extended make-believe spaces where 'acting as if' is a natural part of their exploration. At the same time these spaces - whether foregrounding social networking, gaming, generating content, or a combination of these – offer opportunities, driven by 'what if' thinking, to self-create through gaming, social networking and generating content of their own. Active players, the virtual worlds they inhabit alongside the actual, are emotionally rich spaces which offer complexity, connectedness and a networked playful world extending on into adulthood. An intriguing feature of this special digital playfulness is the sense in which it is possible to continue to play on as an adult into older age whilst other embodied options for playing (for example in the local play-park) are less accessible as a person grows older. Another aspect of this emergent and extensive playfulness is its umbilical link with consumerism; through their digital engagement, children and young people are actively engaged as discerning consumers.

**Possibilities:** in these virtual, multiple spaces for play, for connecting and constructing content, there are many opportunities for possibility thinking – or actioning the transition from what is to what might be. Broad and varied choices are offered, often enabling ways of co-constructing with others. These are highly

creative spaces in which collaborative work (shared with others) and communal work (co-developed and co-owned) is developed; a distinction articulated by Chappell *et al*, 2011, Chappell and Craft, 2011 and Craft *et al*, 2012).

**Participation:** continuous connectivity offers enticing opportunities for high participation. These are 'distributed social organisations' which are often self-managed (Squire, 2006:22). Characterised by playfulness, pluralities and possibilities, and thus bringing together the first three P's articulated above, digital media seem to offer children and young people opportunities to take action, and to have their voices heard with relative ease. Online participation has an irresistible quality, which, drawing on Lyman *et al*'s (2004) analysis, can be understood as enabled by three elements:

enacted imagination (predicted by Hsi *et al*, 2005 and building on what Lyman *et al* refer to simply as 'imagination'). Hsi *et al* envisioned children could be 'creators, producers, and generators of imagination if provided with equitable access to digital media, human instructional resources, and technologies to develop digital fluency' (2005:1). This turns out to have been highly accurate. A potent aspect of this *enacted* imagination, or imagination brought into action, is doing so with others.

playful co-participation (extending what Lyman *et al* name as 'communication'). The content generating, gaming and social networking inherent in digital technology assumes interaction with others and co-shaping of the social environment (Greenfield and Yan, 2006). What Lyman *et al* referred to in 2004 to as communication, seems more accurately in 2011 to be described as playful co-construction and co-participation given the stake felt by participants in, and access to, what is being developed – through instant messaging, blogs, chats, forums, e-mail, gaming, personal and other websites and so forth. In these co-participative playful spaces, the nature of friendship is itself changing (Palfrey and Gasser, 2008) although friendship online is frequently with people known in real life (Gross, 2004), nevertheless digital media make possible other connections beyond the embodied, here and now, connections meaning that playful co-participation can involve collaborating with virtual strangers. It should also be noted that gaming can be very serious; also that the use of gaming in education may not actually be motivational (Pelletier, 2009); the analysis in this article serves to articulate aspects of lived experience of children and young people outside of formal education (raising implications for education itself).

making the voices of children and young people heard Building on Lyman *et al*'s 'cultural production', which acknowledges opportunities through digital media for children and young people to make public co-representations of experience which are then challenged, evolved, manipulated online by others, I would argue that such cultural co-production makes audible children's voices in a more political sense. The infrastructure itself is a potent tool for political engagement for children and young people as revealed in the work of Livingstone *et al* (2005) which showed how the technology itself offers and encourages creative civic participation and interactivity albeit in a spectrum of participation, ranging through what this particular research team called *interactors*, the *civic-minded* and the *disengaged* (ibid).

Digital media also offer children and young people opportunities to be highly visible (which of course brings risks including those of bullying, eg Gillis, 2006), and to act as agents of change in their own lives and beyond (albeit within what are often highly marketized environments).

Children and young people, then, are growing up in a vastly changing context. No aspect of their lives is untouched by the digital era which is transforming how they live, relate and learn. Digital natives, as Prensky (2010a, 2010b) characterises them, are able (and expect) to work with information very fast, and to 'read' a wide variety of data including moving images in non-linear, parallel and often highly playful ways. Fast, active, digital connectivity with others through hand-held pocket sized devices, is assumed and is played out in social networking learning communities (Kukulska-Hulme et al, 2009, Sharples *et al*, 2005), where players are mobile and engage in connected interaction, immersive gaming and through designing and generating content which combines still and moving images and sound.

### **The four P's, everyday creativity and discourses of childhood**

Inherent to all four P's, is little c creativity (Craft, 2002, 2005), in other words thinking and acting 'outside of the box' in everyday contexts. It has been argued elsewhere that the continuous and rapid change in social, economic, environmental, technological and spiritual contexts mean increasingly complex lives for many – perhaps most – living in the Western world, and that at the heart of these societies is the high value placed on personal choice, making personalised choices about immediate and wider personal futures. Such choices are made as noted above, in the context of global marketization (Craft, 2005, 2008). Little c creativity, driven by possibility thinking, is relevant and active across all contexts, may generate both ideas and products (Craft, 2005, 2010).

Possibility thinking at the heart of little c creativity involves the transition from *what is* to *what might be*, through 'what if?' and 'as if' thinking. Qualitative empirical studies have revealed seven features expressed through individual, collaborative and communal engagement (Craft *et al*, 2012): question-posing, play, immersion, innovation, risk-taking, being imaginative, self-determination and intentionality (Burnard *et al*, 2006, Craft *et al*, 2011), questioning driving it (Chappell, 2008). It is more focused on 'self-creating' and 'co-creating' than on changing the world, unlike 'high c creativity' (eg Gardner, 1993). Little c creativity, driven by possibility thinking has much in common with learning itself, in that new understandings are reached. Beghetto and Kaufman (2007, 2009) refer to such everyday creativity particularly that which focuses on personal meaning-making, as 'mini-c' creativity.

The four P's have little c creativity inherent within them, each one enabling and demanding creativity within and between people. Pluralities invite imagination, taking on new perspectives and other personae entering and constructing novel spaces and means of engaging. Playfulness in digital contexts as argued above, is, just as in non-digital playspace, inherent to creativity, involving 'what if' and 'as if' whether through generating content, social networking or gaming. Similarly generating and following through possibilities is, essentially, what lies at the heart of all creativity. Participation brings together pluralities, playfulness and possibilities offering the potential for children and young people to make things happen, making their voices heard and their ideas visible, enacting imagination through playful co-participation although of course participation is not necessarily easy or indeed conflict-free as studies of communities of practice show (Wenger, 2008, Chappell and Craft, 2011).

Understood in this way, it can be seen that the digital play-spaces of children and young people, thus offer inherent opportunities for creativity. And infusing young people's capacity to be engaged in 'what if and 'as if' thinking in linked and overlapping virtual and actual worlds are the two competing discourses of childhood introduced earlier.

On the one hand technology is seen as dangerous, bringing situations into reach from which children should be protected. This RISK discourse exploits the fears of parents and educators and seeks to protect children whilst at the same time preparing them for an adult world. Children and young people are seen as consumers but this is mediated by adults.

On the other hand technology is seen as empowering and liberating, enabling children and young people as active producers as well as consumers. Play is visible and active, and the discourse acknowledges children moving beyond adult control, route-finding into multiple work roles, where technology offers opportunity and children are techno-savvy.

It's perhaps an over-simplistic dichotomisation but it serves to highlight two different and visible engines which drive educational provision. The childhood at risk discourse implies a need for an educational programme which keeps children safe, whilst the discourse of children as empowered, celebrates the immense potential offered – and experienced – in digital media, and strives for an educational programme which integrates the digital media that children experience in the (majority of) time spent beyond the classroom, with analogue media traditionally valued and adopted by education.

Despite the fact that so many learners enter the classroom space with pocket-sized connected computers in their pockets, used during informal aspects of the educational experience particularly by teenagers and older learners to contact and network or play with friends and to upload and enjoy content made by others – including peers – it seems that the emergence of the inherent four P's in digital media pose a challenge for educators, highlighting the need for creative responses.

The four P's, as characteristics of changing childhoods in a digital world, pose challenges for educators. They bring into focus, and challenge, educational values; what we privilege, how we go about structuring learning systems, how we support learning and develop pedagogy, what we choose to assess. Educational provision is at a crossroads. We choose to reproduce and improve the Victorian legacy of universal education that protects children seeing them as adults-in-training, and teaches them through cohort-based face to face local schools, with an assessment system which rewards individuals and a performative framework seeking constantly to drive up standards, or we allow technology to open up new possible ways of learning which acknowledge the many ways in which children and young people are already empowered and expert. Learning beyond boundaries, across age phases, harnessing motivation, enabling high participation and nurturing creative possibility thinking, are all possible if we are brave enough to acknowledge the potency of childhood and youth and to co-create the future.

### **Creative possibilities for educational provision?**

Educators, then, need to respond to the changing nature of childhood. The four P's of changing childhood and youth (Craft, 2011) lay down a challenge for appropriate educational provision, highlighting the need for creativity in both means and its ends. The four P's highlight the transactional, interactive, multiple-realities, *dialogic* approaches to learning increasingly examined and discussed by educators seeking to understand and develop the dynamics of 21<sup>st</sup> century classroom interactions (eg Alexander, 2008, Wegerif, 2007) informed by social constructivist framing of learning. The diversity and multi-voiced approaches both with and without technology inherent in dialogic approaches to learning and teaching, seem to imply a view of the child as empowered and potent, and above all, as holding creative potential as a possibility thinker not only alone but, vitally, with others.

Such a perspective stands in stark contrast to what characterised education in the first half of the 20<sup>th</sup> century reflecting a single dominant framework of 'objectified' as opposed to 'perceived' reality which underpinned a didactic classroom stance (McWilliam, 2008), setting up a dialectical relationship with the aim of hegemonic domination through reason discussed more fully elsewhere (Craft, 2011). Yet, social, economic and technological change including the role of media and technology across the world from the mid-20<sup>th</sup> century onward has brought significant change in social values. Making visible multiple perspectives and thus exposing the compatibility of some and the incommensurability of others, the notion of a singular reality is challenged by the multiple realities evidenced in learning communities

with respect to power, ethnicity, gender, disability, race/ethnicity and other values (eg Walsh, 2007).

The challenges faced by the planet globally are analysed by some commentators as partially fuelled by these multiple realities; fundamentalist belief-based conflict vies for attention alongside the complex systems fuelling globalisation, ecological destruction and large-scale human-made disasters waiting to happen through climate change and over-use of primary resources. Global economic change prompted by the Western banking crisis, in tension with the rise of new super-states and the decline of former power bases, mean that an emerging age of austerity competes with an equally powerfully emerging age of uber-acquisition (eg Anthony, 2011, Halal and Manen, 2011, Burke, 2011). Questions are raised about the relative worth of different forms of knowledge, for the utilitarian value of the sciences and technology compared with the interpretive and analytic value of the humanities, social sciences and classics, the rallying value of sports and the transformational value of the arts (eg Chappell *et al*, 2011, Eisner, 2004, Craft *et al*, 2011).

These global challenges are also highly personal. As commentators have argued, we have perhaps never before in our history needed to draw on our creative potential as urgently and with as much insight as we do today. Creative responses are urgently demanded in the education systems as a whole as well as among learners in schools and in higher education (eg Craft, 2011, Slaughter, 2010).

As argued elsewhere, educators need to be both creative and wise (Claxton *et al*, 2008), to motivate and inspire children and young people, attending to the development of thoughtful, responsible and sustainable possible futures for themselves and others. This must involve offering children and young people opportunities to develop critical awareness of the consequences of globalised capitalism and extension beyond individualism. This demands imagination of teachers as well of learners.

### **Childhood as empowered: a narrative for creative educational futures**

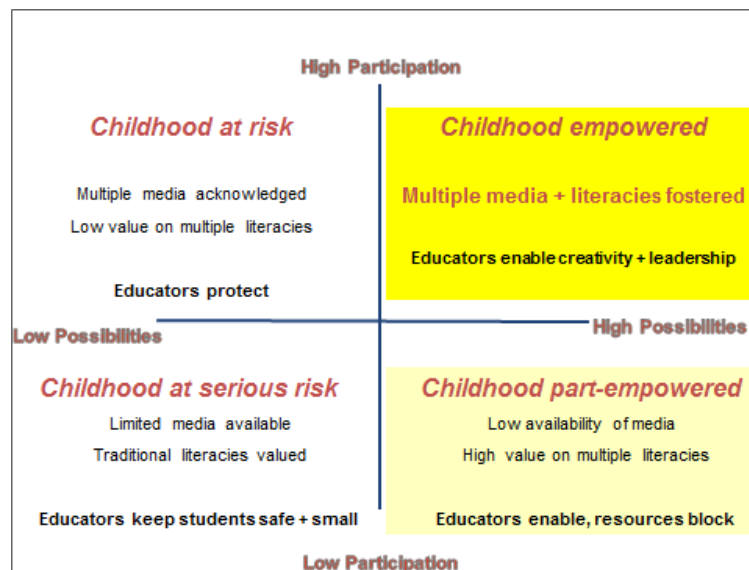
Depending on what educators value most (ie education for safety or education for empowerment), the potential for integration within schools is therefore simultaneously both more open and, potentially, more closed. This paper argues for embracing childhood and youth as empowered through digital media, and thus for educational provision which reflects such empowerment. It acknowledges the need for a 'quiet revolution' in education (Fielding and Moss, 2010, Chappell *et al*, 2011) that harnesses the considerable capacities of children and young people to engage in and co-construct possible futures, and to challenge some current assumptions about life on planet Earth.

Distinguishing between probable educational futures (where the emphasis is on prediction), preferable educational futures (where the emphasis is on narrowing choices) and possible educational futures (where many potential pathways are both emergent and available), it is the latter that this last part of the paper addresses.

The four P's offer both a landscape and a compass for such a revolution. The *digital landscape* in the lives of the majority of children and young people being educated in the developed world, is characterised, by plurality (of places, people, personae, activities, literacies) and by playfulness (in relation to make believe, connectedness and consumerism). Plurality and playfulness contribute to learning experiences of children and young people beyond the classroom as interactive, engaging, enticing, exciting, fun and portable.

And participation and possibilities provide a form of *compass*, or navigational tool for educators in orienting creative education futures. Participation and possibilities can be charted in relation to one another, and with respect to views of childhood. Fig II shows how

creative educational futures involve positive participation and positive possibility thinking, together with high use of multiple media and multiple literacies, thus enabling the landscape of playfulness and plurality to become part of the classroom.



**Fig II<sup>3</sup>: Participation and Possibilities mapped against discourses of childhood**

Enabling creative educational futures which reflect the agenda of childhood as empowered, demands creation of high trust, social environments permeated by digital media. This is a quiet revolution, then, which extends literacy to explore how visual, text and audio data is authored and interpreted, and also extends medium, to recognise multiple ways in which information is conveyed and meaning made.

In this quiet revolution, children and young people are encouraged and valued in working together to have ideas and see these through. This is a high trust environment offering an empowering, creative experience of learning characterised by a sense of relevance, ownership of the learning, control over ideas and opportunities to innovate (Fig III).

<p><b>High participation, low possibilities</b></p> <p>Characterised by access to multiple (including digital) media for learning hence opportunity for children and young people to participate deeply. However, adult determined activity may imply low trust in what students might initiate in these learning spaces. Adults emphasise individual engagement. Consequently, potential for imagining and seeing through possibilities, and particularly with others, is low.</p>	<p><b>High participation, high possibilities</b></p> <p>Multiple media are valued and provided, multiple literacies valued and supported. Children and young people are encouraged and valued in working together to have ideas and see these through. This is a high trust environment in which participation is high and so is possibility thinking. It is an empowering, creative experience of learning characterised by a feeling of relevance, ownership of the learning, control over ideas and opportunities to innovate.</p>
<p><b>Low participation, low possibilities</b></p> <p>Limited learning media available. Adult-determined boundaries around which literacies are valued. Emphasis on individual engagement. Potential for participation is, restricted mainly to non-digital media and literacy (ie traditional writing/text which enables some but excludes others). Potential for possibilities is also therefore narrower than it might be. What children can do artificially privileges the individual and is limited to non-digital contexts. This does not reflect what the majority of children experience, and are experts in, beyond the classroom and so causes children and young people to be perceived as novices where they could have brought powerful tools to their learning.</p>	<p><b>Low participation, high possibilities</b></p> <p>Characterised by limited availability of multiple (including digital) media, and yet high emphasis on multiple/ extended literacies. Children and young children are trusted to be able to engage appropriately in and beyond digital media and so possibility thinking potentially high, with children being encouraged to generate 'possibility broad' ideas and to work together on these. But with limited media available, participation is potentially low in practice.</p>

<sup>3</sup> Originally published in Craft, A. (2011) *Creativity and Education Futures*. Stoke on Trent: Trentham Books.

## **Fig III<sup>4</sup>: Analysis of provision in classrooms in relation to participation and possibility**

Using the compass of participation and possibility to acknowledge pluralities and playfulness, demands high trust pedagogy which encourages uncertainties, co-construction, diversity and dialogue. And perhaps most importantly it involves scrutiny of values, and encourages new ways of collaboratively looking at old problems, where educators not only seek to reflect changing childhood and youth but to take an active and co-participative role alongside young people in continuing to change it through dialogic interaction.

### **Concluding thoughts**

In a digital, marketized age, children and young people can be understood and recognised as creative and potent. Given the reach and accessibility of digital media they (and, potentially, their teachers and parents) are both more empowered and also perhaps more exposed than they have ever been before. As educators involved in schools and universities seek to re-imagine their provision, new ways of considering the challenges are needed, shifting, through collective possibility thinking, from what is to what might be. This paper has set out a perspective on imagining what might be, nurturing co-creativity through dialogue to both acknowledge and nurture the 4 p's: plurality, playfulness, participation and possibilities.

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### **References**

- Alexander, R. (2008) *Toward Dialogic Teaching: Rethinking Classroom Talk*. Thirsk: Dialogos.
- Anthony, M.J. (2011). Crisis, Deep Meaning and the Opportunity for Change. *Journal of Futures Studies*, 16 (2). 47-64
- Beck, U. (1992) *Risk Society: towards a new modernity*. London: Sage.
- Bennett, S., Maton, K., Kervin, L. (2008). The 'digital natives' debate: a critical review of the evidence. *British Journal of Educational Technology*, 39 (5). 775-786
- Bijker, W.E. (1995). *Of bicycles, bakelites, and bulbs: Towards a theory of sociotechnical change*. Cambridge, Mass.: MIT Press.
- Brown, K., Jackson, M. and Cassidy, W. (2006) Cyber-bullying: Developing policy to direct responses that are equitable and effective in addressing this special form of bullying. *Canadian Journal of Educational Administration and Policy*, 57: 8-11.
- Buckingham, D. (2007). *Beyond Technology. Children's learning in the age of digital culture*. London: Polity Press.

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<sup>4</sup> As footnote 3

- Burke, T. (2011). The Rise and Fall of Growth: The Inappropriateness of Continuous Unchecked Growth. *Journal of Futures Studies* 16(1) 79-100
- Burnard, P., Craft, A., Grainger, T. *et al.* (2006). Possibility thinking. *International Journal of Early Years Education*, 14(3), 243–262
- Callon, M. (1986). Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. In Law, J. (Ed). *Power, Action and Belief: A New Sociology of Knowledge*. London: Routledge and Kegan Paul.
- Chappell, K. 2006. Creativity within late primary age dance education: Unlocking expert specialist dance teachers conceptions and approaches. Ph.D. Thesis; Laban, London: <http://kn.open.ac.uk/public/document.cfm?documentid=8627>. (20 February 2012)
- Chappell, K. 2008. Towards Humanising Creativity. *UNESCO Observatory*. E-Journal Special Issue on *Creativity, policy and practice discourses: productive tensions in the new millenium* Volume 1, Issue 3, December 2008. <http://www.abp.unimelb.edu.au/unesco/ejournal/vol-one-issue-three.html> (20 February 2012)
- Chappell, K. and Craft, A. (2011). Creative Learning Conversations: Producing Living Dialogic Spaces. *Educational Research* 53(3), 363-385
- Chappell, K., Craft, A., Burnard, P., Cremin, T (2008), Question-posing and Question responding: the heart of 'Possibility Thinking' in the early years. *Early Years*, 28(3), 267-286
- Chappell, K., Rolfe, L., Craft, A., Jobbins, V. (2011), *Close Encounters: Dance Partners for Creativity*. Stoke on Trent: Trentham Books
- Clack, J. (2011). What features of mathematics activity enable possibility thinking in the Key Stage 2 classroom and how do teachers enable them? Unpublished Doctoral Thesis, University of Exeter, July 2011.
- Claxton, G., Craft, A. and Gardner, H. (2008) Concluding Thoughts: Good Thinking – Education for Wise Creativity. In Craft, A., Gardner, H., Claxton, G. *et al* (2008) *Creativity, Wisdom and Trusteeship. exploring the role of education*. Thousand Oaks: Corwin Press.
- Cordes, C. and Miller, E. (2000) Fool's Gold: A Critical Look at Computers in Childhood. [http://drupal6.allianceforchildhood.org/fools\\_gold](http://drupal6.allianceforchildhood.org/fools_gold) (25 July 2011).
- Corsaro, W.A. (1997) *Sociology of Childhood*. Thousand Oaks, CA: Pine Forge Press.
- Craft, A. (2001). Little c creativity. In Craft, A., Jeffrey, B., Leibling, M. (Eds). *Creativity in Education* (pp45-61). London: Continuum.
- Craft, A. (2005) *Creativity in Schools: Tensions and Dilemmas*. Abingdon: Routledge.
- Craft, A. (2010). 'Teaching for Possibility Thinking: What is it and how do we do it?' *Learning Matters*, 15(1), pp19-23
- Craft, A. (2011a). *Creativity and Education Futures: Learning in a Digital Age*. Stoke on Trent: Trentham Books
- Craft, A. (2011b). The possibilities are endless! *Teach Nursery*, 1(3) p49-50
- Craft, A., Cremin, T. with Downing, D., Hay, P., Cochrane, P., Parker, D., Manser, S. (2011). *Creativity and the Arts in Education: Evidence Summary*. Coalition for Education in the 21st Century [www.c4e21.org](http://www.c4e21.org) (20 February 2012)



- Craft, A., McConnon, L., Matthews, A. (2012) Creativity and child-initiated play: fostering possibility thinking in four-year-olds. *Thinking Skills and Creativity* 7(1) 48-61
- Cremin, T., Burnard, P., Craft, A. (2006), Pedagogy and Possibility Thinking in the early years, *Thinking Skills and Creativity*, 1(2), 108–119
- Cunningham, H. (1995) *Children and Childhood in Western Society Since 1500*. London: Longman.
- Cunningham, H. (2006) *The Invention of Childhood*. London: BBC Books.
- Eisner, E. (2004). What can education learn from the arts about the practice of education? *International Journal of Education and the Arts* 5(4) 1-13
- European Commission (2010). *Europe 2020: A European strategy for smart, sustainable and inclusive growth*. Brussels: European Commission.  
[http://eunec.vlor.be/detail\\_bestanden/doc014%20Europe%202020.pdf](http://eunec.vlor.be/detail_bestanden/doc014%20Europe%202020.pdf) (20 Feb 2012)
- Facer, K., Craft, A., Jewitt, C., Mauger, S., Sandford, R., Sharples, M. (2011). Building Agency in the Face of Uncertainty. Outcome of ESRC Seminar Series on Educational Futures (2009-11) – <http://edfuturesresearch.org/wp-content/uploads/2011/06/Building-Agency-in-the-Face-of-Uncertainty-Thinking-Tool.pdf> (16 Nov 2011)
- Facer, K., Furlong, J., Furlong, R. and Sutherland, R. (2001a) 'Constructing the child computer user: from public policy to private practices', *British Journal of Sociology of Education*, 22 (1): 91-108
- Feenberg, A. (1999). *Questioning Technology*. London: Routledge
- Fielding, M and Moss, P (2010) *Radical education and the common school: a democratic alternative*. London: Routledge
- Frasca, G. (2003) Simulation Versus Narrative: Introduction to Ludology. In M. J. P. Wolf and B. Perron (eds). *The Video Game Theory Reader*. London: Routledge
- Frechette, J. (2006) 'Cyber-censorship or cyber-literacy? Envisioning cyber-learning through media education', p149-71 in D. Buckingham and R. Willett (eds), *Digital Generations: Children, Young People and New Media*. Mahwah, NJ: Lawrence Erlbaum.
- Friedman, T.L. (2005) *The World is Flat a Brief History of the Twenty-First Century*. New York: Farrar, Strauss and Giroux.
- Friedman, T. (2007) *The World is Flat*. New York, NY: Picador.
- Greenfield, P. and Yan, Z. (2006) Children, Adolescents, and the Internet: A New Field of Inquiry in Developmental Psychology. *Developmental Psychology* 42(3): 391-394.
- Gross, E. F. (2004) Adolescent Internet use: What we expect, what teens report. *Journal of Applied Developmental Psychology*, 25: 633-649.
- Hakim, C. (2000) *Work-Lifestyle Choices in the 21st Century: Preference Theory*. Oxford: Oxford University Press.
- Halal, W. and Manen, M. (2011). Global Mega-Crisis: A Survey of Four Scenarios on a Pessimism-Optimism Axis. *Journal of Futures Studies* 16(2) 47-54
- Harden, J. (2000) There's No Place Like Home. *Childhood*, 7(1): 43-59.

- Hsi, S., Pinkard, N. and Woolsey, K. (2005) *Creating equity spaces for digitally fluent kids*. Available at: [http://www.exploratorium.edu/research/digitalkids/Digital\\_equity\\_paper.pdf](http://www.exploratorium.edu/research/digitalkids/Digital_equity_paper.pdf) (26 August 2011).
- James, C. with Davies, K, Flores, A., Francies, J.M., Pettingill, L., Rundle, M., Gardner, H. (2009). *Young people, ethics, and the new digital media: a synthesis from the GoodPlay Project*. Cambridge, MA: MIT Press [http://mitpress.mit.edu/books/full\\_pdfs/Young\\_People\\_Ethics\\_and\\_New\\_Digital\\_Media.pdf](http://mitpress.mit.edu/books/full_pdfs/Young_People_Ethics_and_New_Digital_Media.pdf) (19 Feb 2012)
- Jones, G. (2008). 'Youth, citizenship and the problem of dependence', in A. Invernizzi and J. Williams (eds) *Children and Citizenship*. Sage. pp. 97-107.
- Kukulka-Hulme, Agnes; Sharples, Mike; Milrad, Marcelo; Arnedillo-Sánchez, Inmaculada and Vavoula, Giasemi (2009). Innovation in Mobile Learning: A European Perspective. *International Journal of Mobile and Blended Learning*, 1(1), pp. 13–35
- Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory* Oxford: Oxford University Press.
- Law, J. (1987). Technology and Heterogeneous Engineering: The Case of Portuguese Expansion. In W.E. Bijker, T.P. Hughes, and T.J. Pinch (eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press.
- Lenhart, A. and Madden, M., MacGill, A.R., Smith, A. (2007) Teens and Social Media: the use of social media gains a greater foothold in teen life as they embrace the conversational nature of interactive online media. *Pew Internet and American Life Survey* available at: [http://www.pewinternet.org/~media/Files/Reports/2007/PIP\\_Teens\\_Social\\_Media\\_Final.pdf.pdf](http://www.pewinternet.org/~media/Files/Reports/2007/PIP_Teens_Social_Media_Final.pdf.pdf) (26 August 2011).
- Lenhart, A., Purcell, K., Smith, A., Zickuhr, K. (2010). *Social Media and Internet Use among Teens and Young Adults*. Washington, DC: Pew Internet Survey. <http://pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx> (26 August 2010)
- Law, N., Yuen, A., Fox, R. (2011). *Educational Innovations Beyond Technology: nurturing leadership and establishing learning organisations*. New York: Springer
- Lin, Y-S. (2010). Drama and possibility thinking – Taiwanese pupils' perspectives regarding creative pedagogy in drama? *Thinking Skills and Creativity*, 5(3),108–119.
- Lin, Y-S. (2011). Fostering creativity through education – A conceptual framework of creative pedagogy? *Creative Education*, 2(3), 149–155.
- Livingstone, S. (2003) Mediated Childhoods: A Comparative Approach to Young People's Changing Media Environment in Europe. In Turow, J. and Kavanaugh, A.L. (eds). *The Wired Homestead. An MIT Press Sourcebook on the Internet and the Family*. Cambridge, MA: MIT Press.
- Livingstone, S., Bober, M. and Helsper, E, (2005) Active participation or just more information?: young people's take up of opportunities to act and interact on the internet [online]. *London: LSE Research Online*. Available at: <http://eprints.lse.ac.uk/1014> . Available in LSE Research Online: May 2007. (20 August 2009).
- Livingstone, S. (2009) *Children and the Internet*. Cambridge: Polity Press.
- Lyman, P., Billings, A., Perkel, D., Ellinger, S. and Finn, M. (2004) *Literature Review: Kids' Informal Learning and Digital-Mediated Experiences*. Commissioned paper for the MacArthur Foundation.

- Molesworth, M. and Denegri-Knott, J. (2005) The Pleasures and Practices of Virtualised Consumption in Digital Spaces. *Proceedings of DiGRA 2005 Conference: Changing Views – Worlds in Play*. Available at: <http://www.digra.org/dl/db/06276.33335.pdf> (26 August 2011)
- Maslow, A. (1987). *Motivation and Personality* (3rd edition) New York: Harper and Row
- McWilliam, E. (2008). Unlearning how to teach. *Innovations in education and teaching international*, 45(3), 263–269.
- Newburn, T. (1996) 'Back to the future? Youth crime, youth justice and the rediscovery of 'authoritarian populism', in J. Pilcher and S. Wagg (Eds) *Thatcher's Children? Politics, Childhood and Society in the 1980s and 1990s*. London: Falmer.
- OECD Centre for Educational Research and Innovation (2008). *New Millennium Learners Initial findings on the effects of digital technologies* <http://www.oecd.org/dataoecd/39/51/40554230.pdf> (20 Feb 2012)
- Palfrey, J. and Gasser, U. (2008) *Born Digital: understanding the first generation of digital natives*. New York: Basic Books
- Pelletier, C. (2009). Games and learning: what's the connection, *International Journal of Learning and Media* (1)1: 83-101
- Pinch, T. and Bijker, W. (1987). "The Social construction of facts and artefacts: Or how the sociology of science and the sociology of technology might benefit each other," In: W.E. Bijker, T.P. Hughes, and T.J. Pinch (editors). *The social construction of technological systems: New directions in the sociology and history of technology*. Cambridge, Mass.: MIT Press, pp. 17–50.
- Postman, N. (1983) *The Disappearance of Childhood*. London:W.H.Allen.
- Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kappan*, 42, 305-310
- Rideout, V., Foehr, U. G., & Roberts, D. (2010). *Generation M2: Media in the lives of 8- to 18-year-olds*. Menlo Park, CA: Henry J. Kaiser Family Foundation.
- Sharples, M., Taylor, J., Vavoula, G. (2005). Towards a Theory of Mobile Learning <http://www.mlearn.org.za/CD/papers/Sharples.pdf> (20 Feb 2012)
- Slaughter, R. (2010). *The Biggest Wake Up Call in History*. Brisbane: Foresight International
- Squire, K. (2006) From Content to Context: Videogames as Designed Experience. *Educational Researcher*, 35(8): 19-29.
- Voydanoff, P. (1988) Work role characteristics, family structure demands, and work/family conflict. *Journal of Marriage and the Family*, 50 (3): 749-61.
- Walsh, C. (2007). Creativity as capital in the literacy classroom: youth as multimodal designers. *Literacy*, Vol 41, No 2, pp. 79-85, Blackwell, UK
- Wegerif, R. (2007) *Dialogic Education and Technology: Expanding the Space of Learning*. New York: Springer.
- Wei, L., Blanks Hudson, D. (2011). Does the digital divide matter more? Comparing the effects of new media and old media use on the education-based knowledge gap. *Mass Communication and Society* 14(2) 216-235

Wenger, Etienne (1998) 'Communities of Practice. Learning as a social system', *Systems Thinker*, <http://www.co-i-l.com/coil/knowledge-garden/cop/lss.shtml> (20 Feb 2012)

World Bank Development Data Group (2011). *World Development Indicators*. Washington, DC: International Bank for Reconstruction and Development/The World Bank

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