



# The digital native – myth and reality

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## Abstract

**Purpose** – The purpose of this paper is to develop and promote a realistic understanding of young people and digital technology with a view to supporting information professionals in playing useful and meaningful roles in supporting current generations of young people. In particular the paper aims to offer a critical perspective on popular and political understandings of young people and digital technologies – characterised by notions of “digital natives”, the “net generation” and other commonsense portrayals of expert young technology users. The paper seeks to consider the accuracy of such descriptions in reflecting young people’s actual uses of digital technology and digital information.

**Design/methodology/approach** – The paper provides a comprehensive review of the recent published literatures on young people and digital technology in information sciences, education studies and media/communication studies.

**Findings** – The findings show that young people’s engagements with digital technologies are varied and often unspectacular – in stark contrast to popular portrayals of the digital native. As such, the paper highlights a misplaced technological and biological determinism that underpins current portrayals of children, young people and digital technology.

**Originality/value** – The paper challenges the popular assumption that current generations of children and young people are innate, talented users of digital technologies. Having presented a more realistic basis for approaching generational differences in technology use, the paper explores the functions and roles that information professionals can be expected to play in supporting young people in the digital age.

**Keywords** Children (age groups), Youth, Internet, Digital communication systems

**Paper type** General review

## Introduction

The notion of children and young people as confident and often “expert” computer users has proliferated popular and political rhetoric in Western societies for the past 30 years. From the 1970s’ phenomena of the “computer hacker” and “video gamer” onwards, perceptions of omnipotent young computer users have been instrumental in shaping public expectations and fears concerning technology and society (see Selwyn, 2003). Of course, these stories about young people and digital technology echo earlier representations of children and twentieth century analogue media such as film, radio, television, comic books and magazines (Wartella and Jennings, 2000). Yet, whilst “children” and “childhood” have been long established as discursive sites through which adults can conceptualise and (re)construct past, present and future aspects of societal change, the emblematic role of the child has been especially prominent in debates over the past ten years concerning the societal role of new digital technologies such as personalised, portable computerised devices and so-called “social software” and “Web 2.0” internet tools. Indeed, the first years of the 2000s have been subject to a particularly virulent strain of the child computer user discourse, typified by portrayals of “digital natives” and the “net generation”. These simplified understandings remain



influential in shaping contemporary public, political and academic expectations of the technological capabilities and demands of those children and young people who were “digitally born” in the late twentieth and early twenty-first centuries (Seely-Brown, 2008).

The specific label of “digital native” derives from a series of articles written since 2001 by the US technologist Marc Prensky. Prensky described the generation of young people born since 1980 as “digital natives” due to what he perceived as an innate confidence in using new technologies such as the internet, videogames, mobile telephony and “all the other toys and tools of the digital age” (Prensky, 2001, p. 1). Rather than using digital technology merely as part of their everyday lives, Prensky argued that technology was essential to these young people’s existence – depicting young people as now being constantly “surrounded” and “immersed” by these new technologies in ways that older generations were not. Recently, Prensky has argued that this permanent state of technological immersion and dependence is encapsulated in the lifestyles of upcoming generations of “i-kids” (Prensky, 2008a), who remain “plugged into” portable, personalised devices such as mobile telephones, mp3 players and handheld games consoles. Prensky’s writing typifies a burgeoning body of recent commentary that has sought to document the distinct technological cultures and lifestyles of emerging generations of young people. The US author Donald Tapscott, for example, has developed a corresponding thesis to Prensky, detailing the high-tech activities and expectations of the “net generation” of young people who were born between 1977 and 1996 and subsequently “grew up bathed in bits” (Tapscott and Williams, 2008, p. 47). A host of other commentators have written similarly of the “born digital” (Palfrey and Gasser, 2008), “homo-zappiens” (Veen and Vrakking, 2006) and “net savvy” youth (Levin and Arafeh, 2002). In a domestic sense these are young people who are described as living “digital childhoods” (Vandewater *et al.*, 2007) ensconced within “media families” (Rideout and Hammel, 2006). From an educational viewpoint, these are “New Millennium Learners” (Pedró, 2007). All told, many popular, political and academic accounts of technology and society now assume a distinct step-change in the ways in which contemporary forms of childhood, adolescence and young adulthood are predicated around digital technology and media.

As the examples above imply, this loose body of digital native literature is predicated upon a common perception of generational divide and disjuncture, with present cohorts of children and young people ascribed distinct technological characteristics that set them apart from their elders. Indeed, in reference to the post-baby boomer “generation X” and “generation Y”, some commentators are now portraying the children and young people of the 2000s in specific terms of “generation M” (media), “generation V” (virtual) or “generation C” (referring to characteristics such as connected, creative and click) (see Veen and Vrakking, 2006; Rideout *et al.*, 2005). Whilst varying in their precise detail, all these accounts confer a common set of characteristics on to current generations of children and young people; not least an innate “hardwired” affinity with digital technologies (Fisher and Baird, 2009). Such accounts convey a sense of digital technology being an accepted and expected condition under which young people now conduct their lives. Indeed children are presented as now being “fluent in the digital language of computers, video games and the internet” (Prensky, 2005, p. 8) and placing value on “being literate in media and ICTs in ways that exceed what many [adults] know or even consider worth knowing”

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(Alvermann, 2004, p. 78). In this respect, much of the writing around the digital native theme is concerned less with documenting young people's use of specific digital technologies *per se*, than the general practices and dispositions that digital technologies support and facilitate within their lives. As Mimi Ito and colleagues reason, young people's technology use is now perhaps best seen as a media "ecology" where "more traditional media, such as books, television, and radio, are 'converging' with digital media, specifically interactive media and media for social communication" (Ito *et al.*, 2008, p. 8).

These understandings of the distinctly different technological landscape that young people are seen to inhabit have proved to be highly influential within popular and political discourse, as well as in some scientific discussion. The "commonsensical" notion of the digital native is fore-grounded increasingly in the thoughts and pronouncements of policymakers, technology vendors and opinion formers throughout the world. Yet whilst the idea of young people being notably different from previous generations in their technical aptitudes and abilities may well have a strong intuitive appeal, the ease with which these commonsensical "stories" of the digital native generation are being repeated and "re-told" should be cause for some alarm. As Ng (1997, p. 44) contends, "common-sense thinking is uncritical, episodic, and disjointed, but it is also powerful because it is taken for granted". Thus, whilst the past ten years have undoubtedly witnessed significant changes in the technological practices and predilections of children, young people and young adults, it would seem sensible to reconsider the status of the "digital native" description as a *prima facie* account of young people's lives in the early twenty-first century. In particular, there is a pressing need to develop and promote realistic understandings of young people and digital technology if information professionals (especially librarians, teachers and other information specialists) are to play useful and meaningful roles in supporting current generations of young people. Against this background the present paper now goes on to question the accuracy and primacy of the "digital native literature" in reflecting the realities of young people's actual engagements with digital media and technology.

### **Implications of the digital native discourse**

We should first examine in closer detail the broad body of work that can be said to constitute the digital native literature[1], particularly in terms of how the conditions, capabilities and consequences of young people's technology use are portrayed. In this sense, there are a number of differing practices and dispositions that are associated with the digital native condition.

#### *The empowered digital native*

Many commentators highlight the technology-assisted flexibility that lies at the heart of young people's fluid lifestyles in contemporary society. As such young people are portrayed as a "multitasking generation", reliant on a "digital juggling" of their daily activities and commitments (Wallis, 2006; Foehr, 2006). This flexibility of everyday life is most often portrayed in positive and celebratory terms, conveying a sense of an individual young person being free to choose who they interact with, when and for what purposes. In this way digital natives are seen to benefit from a distinct individualisation of everyday life that derives specifically from digital technology use. In particular, the internet is seen to underpin a capacity to build and maintain

connections with various formal and informal components of their lives – what is often presented as the “personalisation” of activities and services (Green *et al.*, 2006). For example, the internet-connected young learner is often celebrated as being no longer the passive recipient of educational instruction, but instead cast into an active role of (re)constructing the nature, place, pace and timing of learning events as they wish.

This increased empowerment of the individual is seen to enhance young people’s control over the nature and form of what they do, as well as where, when and how they do it. As such the digital native is often portrayed as autonomous and highly sociable. Much has been written, for example, about the importance in young people’s lives of digital cultures of communal creativity via Web 2.0 tools such as social networking sites, wikis and virtual worlds. Children and young people are described as the “collaboration generation” (Tapscott and Williams, 2008, p. 47), eager to work together towards common goals, share content and draw upon “the power of mass collaboration” (Leadbetter, 2008, p. 36). This combination of individualisation and collaboration is often presented as giving young people a propensity to question, challenge and critique. These are individuals who “typically can’t imagine a life where citizens didn’t have the tools to constantly think critically, exchange views, challenge, authenticate, verify, or debunk” (Tapscott and Williams, 2008, p. 47). The inherently sceptical but highly sociable worldview of the digital native generation is portrayed as leading children and young people to construct alternatives to the core values of the traditional institutions and structures of previous generations. Thus instead of kowtowing to the linear restrictions and requirements of the school or broadcast media, young people are described as self-organising and providing such services for themselves. As Tapscott and Williams (2008, p. 52) warn, the Net generation “are not content to be passive consumers, and increasingly satisfy their desire for choice, convenience, customization, and control by designing, producing, and distributing products themselves”.

Much attention is also given within the digital native literature to the technological transformation of young people’s capabilities for learning and processing information. Much of Prensky’s initial writing on the digital native was concerned with the technology-induced capacity of young people to “think and process information fundamentally differently from their predecessors” (Prensky, 2001, p. 1). These claims are seen to be grounded in an emerging body of scientific evidence, with a number of neuroscientists suggesting that internet use enhances the capacity for young people to possess greater working memory and be more adept at perceptual learning (see Small and Vorgan, 2008). It is argued that these cognitive and neurological benefits are reflected in the ease with which digital natives learn at high speed, make random connections, process visual and dynamic information and learn through digitally based play and interactions (Prensky, 2001). As well as these neurological and cognitive advantages, young people are also seen to be able to access vast digital networks of information, resources and people, thus learning in ways that are increasingly “situated” within authentic contexts and webs of knowledge. As Prensky (2008b) speculates, “within the working lives of our students, technology will become a billion times more powerful, likely more powerful than the human brain”. In this sense, what young people learn and how they learn it is seen to be transformed by digital technology, often in ways and places far removed from the concerns of formal settings such as the school or library.

*The disempowered digital native*

Whilst the capabilities of the digital native are most often presented in a positive and celebratory light, some commentators are beginning to contend that the increased autonomy stemming from digital technology use may also lead to the *disadvantaging* and *disempowerment* of children and young people through a set of “risks” and “dangers” of technology use. Concerns have been raised amongst popular commentators and policymakers, for example, over the increased potential for young people to be “at risk” when using digital technologies through a number of “inappropriate” and “challenging” uses of the internet, which place the child at the ultimate risk of harming both themselves and others (see *Byron Review*, 2008). Aside from the physical, emotional and sexual risks associated with young people’s digital excesses, concerns also have been raised over an intellectual and academic “dumbing-down” associated with young people’s digitally redefined relationships with information and knowledge. Thus, some commentators contend that the capacity of young people to learn is now compromised by a general inability to gather information from the internet in a discerning manner. As Andrew Keen (2007, p. 93) puts it, the current generation of school children “is taking search-engine results as gospel”, thus fostering a “younger generation of intellectual kleptomaniacs, who think their ability to cut and paste a well-phrased thought or opinion makes it their own” (Keen, 2007, p. 25). Similar concerns are expressed over the quality of internet-supported learning amongst university students with numerous predictions of the intellectual and scholarly de-powering of a “Google generation” of undergraduates incapable of independent critical thought (e.g. Fearn, 2008). Especially prominent here has been the writing of Tara Brabazon, who describes how online provision of learning resources sets inexperienced students adrift from the support of their teachers and gives them leeway to “behave rashly, make poor judgements and cut corners” (Brabazon, 2007, p. 113). Brabazon’s depiction of the current “net generation” of undergraduate students laments a situation where “clicking replaces thinking” and scholarship consists of little more than “Googling their way” through degree courses (Brabazon, 2007, p. 16) and engaging in forms of “accelerated smash and grab scholarship” (Brabazon, 2007, p. 39).

Aside from the detrimental effect on “traditional” skills and literacies, concerns are beginning to be raised that digital technologies may be contributing to an increased disengagement, disenchantment and alienation of young people from formal institutions and activities. For example, young people are derided as being more interested in using digital technologies such as the internet or mobile telephony for self-expression and self-promotion than for actually listening to and learning from others. As Keen (2007, p. xiii-xiv) contends:

MySpace and Facebook are creating a youth culture of digital narcissism, open-source knowledge sharing sites like Wikipedia are undermining the authority of teachers in the classroom; the YouTube generation are more interested in self-expression than in learning about the insider world; the cacophony of anonymous blogs and user-generated content is deafening today’s youth to the voices of informed experts and professional journalists; kids are so busy self-broadcasting themselves on social networks that they no longer consume the creative work of professional musicians, novelists, or filmmakers.

These concerns have prompted some commentators to point to the digital acceleration of “a culture of disrespect” between young people and formal institutions (Bugeja,

2006). Concerns have been raised over the realignment of power within the child/adult relationship that digital technologies appear to foster, as evinced in web sites such as *ratemyprofessors.com* or young people posting candid video excerpts of their teachers on content-sharing sites such as YouTube. Whilst some commentators welcome the empowering nature of these technology practices, others portray them in negative terms - what a former UK Secretary of State for Education termed “the sinister downside of modern technology” (Johnson, 2007).

### *Implications for adults*

All these depictions of the digital native convey a range of attendant implications for adult generations as well as the institutions and organisations that seek to work with children and young people. In particular, these depictions of the digital native all imply a profound disempowerment of older generations. Prensky (2001) and others describe adults as “digital immigrants” who have been forced to adapt to a world of digital media after (many) years of leading “pre-digital” lifestyles. Such claims imply that adults lack the technological fluency of the younger digital natives and find the skills possessed by them unfamiliar and often foreign (Long, 2005). As Prensky (2005, p. 8) concludes:

I refer to those of us who were not born into the digital world as ‘digital immigrants’. We have adopted many aspects of the technology, but just like those who learn another language later in life, we retain an ‘accent’ because we still have one foot in the past. We will read a manual, for example, to understand a program before we think to let the program teach itself. Our accent from the pre-digital world often makes it difficult for us to effectively communicate with our students.

A distinct tension is evident throughout the digital native literature between “the generations who grow up with these ways of thinking” (Leadbetter, 2008, p. 20) and the “often Web-illiterate” adults in their lives (Keen, 2007, p. 207). Many commentators are therefore led to construct dichotomous “them” and “us” arguments where adults and institutions are rendered obsolete by the rise of the digital native. The structures of the digital immigrant world are seen to be incompatible with the requirements and expectations of young people. It has been argued, for instance, that schools, libraries, universities, museums and other institutions face a “legitimacy crisis” with the young (Kenway and Bullen, 2005). In particular, the digital native way-of-being is seen to be incompatible with the many formal and informal systems of regulation and control which characterise the organisation of such institutions, not least a continued reliance on linear hierarchical relationships to facilitate communication, learning and access to knowledge. Formal institutions such as the school are said to be often “poorly placed to deal well with the social, cultural and economic changes that derive from the continuing use of these [digital] technologies” (Bigum and Rowan, 2008, p. 250).

This intergenerational conflict is presented by some commentators in extreme terms, with digital technologies seen to provide a ready basis for young people’s circumvention of traditional structures and organisations and ability to “fin[d] something online that [institutions] are not providing them” (Jenkins, 2004). For example, Web 2.0 tools such as wiki, syndication and folksonomy software are presented as recasting education away from its present unsatisfactory incarnation as “a special activity that takes place in special places at special times, in which children are instructed in subjects for reasons they little understand” (Leadbetter, 2008, p. 149). Instead, internet technologies are seen to recast education as a “looser” arrangement



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where learning can involve a variety of people and places for a variety of reasons. In this sense, it is suggested that children and young people themselves “can transform the future of the education system” (Tapscott and Williams, 2008, p. 51) through the mass innovation of shared learning resources and learning opportunities regardless of status or authority. Some commentators present these changes as taking place well beyond the aegis or even awareness of adults, leaving little opportunity for digital immigrants to alter practices and modes of provision to fit in with the digital native way-of-being. Indeed, a number of commentators warn against attempts to motivate and engage young people simply through the introduction of consciously “trendy” forms of technology use into formal institutions (Lankshear and Knoebel, 2004). As Tapscott and Williams (2008, p. 54) conclude, the digital natives’ “appetite for authenticity means that they are resistant to ill-considered attempts by older generations to ‘speak their lingo’”. This apparent lack of leeway has prompted growing numbers of commentators to argue that the digital excesses of young people should be tempered and checked, with adults and formal institutions working towards a depowering of the digital native where-ever possible, through the increased regulation and control, blocking and filtering of young people’s technology use (see Keen, 2007).

These arguments notwithstanding, many other commentators reach more conciliatory conclusions, arguing for the fundamental change of existing structures and organisations rather than a total abandonment of the established order. Such change is usually presented in comprehensive terms of reforming the temporal, spatial and epistemological organisation of formal institutions, and developing ways of working within schools, universities, libraries and museums that are more attuned to a “sense” of young people’s digital practice. In schools and universities, for example, educators are being encouraged to develop forms of learning that are based around the collaborative creation rather than individual consumption of content. It is argued that qualities of play, expression, reflection and exploration should be better reflected in the ways that young people are encouraged to consume information and engage with learning; leading to the proposition of various forms of “e-assessment”, “pedagogical mashup”, “remix curricula” and refocusing of the teacher’s role away from provider of information and towards facilitator and guide (Fisher and Baird, 2009). Underpinning many of these suggestions is the belief that young people should be acceded overall control of their interactions with information and knowledge. For instance, Leadbetter (2008, p. 147) suggests a reorientation of the school to make learning “a more peer-to-peer activity ... see[ing] children as part of the school’s productive resources, not just as its consumers”. Prensky (2008b, p. 1) argues similarly for a “new pedagogy of kids teaching themselves with the teacher’s guidance”. This sense of allowing young people the opportunity to influence the direction of institutional change is reflected in Tapscott’s (1999, p.11) advice to “give students the tools, and they will be the single most important source of guidance on how to make their schools relevant and effective places to learn”.

### **Moving beyond the myth of the digital native**

Whilst often compelling and persuasive, the overall tenor of these discursive constructions of young people and technology tends towards exaggeration and inconsistency. The digital native discourse as articulated currently cannot be said to provide an especially accurate or objective account of young people and technology. As we shall go on to discuss in further detail, claims, for instance, over the innate skills

and abilities of young people are grounded rarely, if at all, in rigorous, objective empirical studies conducted with representative samples. At best the “evidence base” for much of the digital native literature is rooted in informal observation and anecdote. Within many of the accounts outlined above, the use of actual evidence or objective analysis appears not to be a major consideration as long as a persuasive case can be made. Thus, at best the digital native literature tends to adopt a legalistic rather than social scientific notion of “evidence” in terms of helping establish a particular case or point of view regardless of contradictory findings (Gorard, 2002).

Indeed, many of the points outlined in the preceding overview of the digital native literature can be said to mainly gain credence not from their empirical substance but from their associations with wider moral and ideological debates over young people and digital technology. Indeed, much of the writing and commentary outlined above is deliberate in its evocation of ongoing moral and ethical debates around children, young people and society, with the topic of technology used to raise “questions about the kind of society we want and the kinds of kids that we seek to raise” (Keen, 2007, p. 154). In this sense, the notion of the “digital native” should be seen more as a discursive than descriptive device, employed by those seeking to exert some form of power and control over the shaping of the digital (near)future. Prevailing notions of digital natives, net generations and the like can be seen as constituting a contemporary “moral panic” (Cohen, 1972), purporting to act in the interest of the young, whilst “mask[ing] a more fundamental motivation to shore up the interests of the establishment” (Livingstone, 2009, p. 121). As we have seen, much of the digital native discourse would certainly appear to support a range of presumed yet unsubstantiated “crisis” accounts about the role of public institutions in supporting current generations of children and young people (see Bennett *et al.*, 2008).

Yet if present understandings of young people and technology are to be advanced, then a more informed and sophisticated debate of the complex realities of digital technology use needs to be encouraged. In particular there is a clear need to advance the digital native debate on from the perpetuation of “common sense” assumptions that tend to inform public discourse about children and technology, and move beyond the theoretically weakened set of essentialist assumptions about children and technology that inform the current digital native commentary. For example, many of the arguments and assumptions outlined above are based on an essentialist biological reading of the “child” and “young person” as somehow naturally technically skilled, thereby “fail[ing] to acknowledge the diversity of the lived experience” of both childhood and adulthood (Buckingham, 1998, p. 556). Much of the digital native commentary can be criticised similarly in its technological determinist view of societal change, where digital technologies are seen to be imbued with a range of inherent qualities which then “impact” (for better or worse) on young users in ways which were consistent regardless of circumstance or context. Yet it is perhaps more helpful to view young people’s use of technologies as being subjected continually to a series of complex interactions and negotiations with the social, economic, political and cultural contexts into which they emerge (see Selwyn, 2008). With these thoughts in mind, the proceeding sections of this paper go on to consider a more empirically grounded and theoretically sensitive analysis of children and young people’s actual uses of digital technologies. Above all an attempt is made to reconcile the currently idealised digital



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native debate with the rather more “messy” realities of young people’s use of these technologies in practice.

### **Considering the realities of young people’s digital technology use**

Empirical studies portray a rather more complex picture of children and young people’s use of new technologies than the digital native commentary would suggest. For example, research studies suggest that young people’s abilities to access digital technologies remain patterned strongly along lines of socio-economic status and social class, as well as gender, geography and the many other entrenched “social fault lines” which remain prominent in early twenty-first century society (Golding, 2000). Indeed, some social groups of young people appear to be as “digitally-excluded” as older generations, albeit in ways which are more subtle and perhaps less apparent to adult commentators than before (see Selwyn and Facer, 2009). For instance, recent studies across Europe and North America show that levels of computer and internet use are lower amongst rural youth, female youth and those from families with low levels of parental education (e.g. Vandewater *et al.*, 2007; Looker and Thiessen, 2003). In particular, the issue of age continues to be reported as a primary influence on the technological needs, interests and practices of children and young people. The social, cultural and cognitive backgrounds of a seven-year-old child are very different to those of an 11-year-old. In turn an 11-year-old has very different social, cultural and cognitive backgrounds to a 15-year-old. It is perhaps unsurprising that significant differences are apparent in the varying nature of technology engagement between and within these age groups (see Rowlands *et al.*, 2008).

Aside from inequalities in access and engagement, there is mounting evidence that many young people’s actual uses of digital technologies remain rather more limited in scope than the digital native rhetoric would suggest. Surveys of adolescents’ technology use, for example, show a predominance of game playing, text messaging and retrieval of online content (Crook and Harrison, 2008; Luckin *et al.*, 2009; Lenhart *et al.*, 2007). The prevalent technology practices of younger children are more rudimentary, centred on writing and image creation, as well as basic gaming (Selwyn *et al.*, 2009). It is also important to note that young people’s internet use often continues to be blended with more passive forms of media consumption such as the viewing of films and television programmes – often in real-time broadcast form as well as “on-demand” viewing. Thus whilst some commentators may like to imagine collaborative communities of content creation, in reality many young people’s engagement with technology is often far more passive, solitary, sporadic and unspectacular, be it at home or in school (Livingstone, 2009). If anything young people’s use of the internet can be described most accurately as involving the passive consumption of knowledge rather than the active creation of content – leading, at best, to what Crook (2008) terms a “low bandwidth exchange” of information and knowledge, with any illusion of collaboration described more accurately in terms of co-operation or co-ordination between individuals. Children and young people are also found to often display a limited ability to successfully use the internet and other research tools (Williams and Rowlands, 2007). In short, for many children and young people, technology use at home or at school remains rather less expansive and empowering than the rhetoric of the digital native would lead us to believe.

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Some recent studies suggest that children and young people do not necessarily expect or even want to use technology in institutional settings such as schools or libraries in the same manner as they do at home (Lohnes and Kinzer, 2007). In this respect, young people should perhaps be seen as rather more discerning in their desire to use (and not use) digital technologies in all aspects of their lives than the digital native rhetoric may suggest. There is also a growing body of evidence of self-regulation when using digital technologies (Mediappro, 2006), suggesting that many children and young people should be seen as more considered and empowered (non)participants in digital practices than is sometimes assumed. This was evident, for example, in Dana Boyd's recent ethnographic study of social networking usage amongst US teenagers that highlighted groups of "disenfranchised teens" and "conscientious objectors". As Boyd (2007, p. 3) observed:

The former consists of those without internet access, those whose parents succeed in banning them from participation, and online teens who primarily access the internet through school and other public venues where social network sites are banned. Conscientious objectors include politically minded teens who wish to protest against Murdoch's News Corp. (the corporate owner of MySpace), obedient teens who have respected or agree with their parents' moral or safety concerns, marginalized teens who feel that social network sites are for the cool kids, and other teens who feel as though they are too cool for these sites.

These studies, and many others like them, highlight the need to recognise the significance of context and circumstance when seeking to understand young people's (non)use of technology. Issues of context are evident, for example, in studies of young people's information seeking behaviours which report the effectiveness of young people's use of digital information to be often contingent on their engagement with the information itself rather than the technology – i.e. the information being sought and the motivation for doing so (Dresang, 2005; Madden *et al.*, 2007). For instance, young people have been found to be more likely than adults of all ages to seek online information about sports, humorous content and entertainment, but less likely to look for information pertaining to health, medical care, religion or travel (Dutton and Helpser, 2007; Pew, 2005). Tellingly, searching for "information on a topic that is hard to talk about" has been found to rank as the least popular internet activity for teenage internet users (Pew, 2001). Thus we should not overlook the continued importance of a wide range of non-technological sources that children and young people may draw upon to meet these information needs, such as intimate personal networks with friends and peers, wider networks of family and community contacts and mass media sources. Indeed, a recurrent finding throughout the research literature on young people's information behaviour is the continued importance of face-to-face conversations to young people's information gathering (Wells and Dudash, 2007). As such, we should remain mindful of the continued significance of "pre-digital" means of interaction and action within the ostensibly digital landscape of the twenty-first century.

### **Reconsidering the role of "digital immigrants" in the lives of children and young people**

Whilst some studies may highlight instances of spectacular digital practices by some young people in some circumstances, more commonly a picture of rather less spectacular technology use and engagement emerges from the empirical literature. In this respect young people's engagements with digital technology appear to be as varied

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as any other aspect of their lives. Of key concern here, then, are the obvious shortcomings of the transformatory and empowering rhetoric of the digital native literature, especially in informing and guiding the actions of policymakers and practitioners seeking to work with children and young people. As Livingstone (2009, p. 43) notes, any such discussion should remain mindful of the differences in quality of technology use between young people, and the importance of not conflating engagement with technology as constituting meaningful engagement with technology that increases agency and empowerment:

Although young people's newfound skills are justifiably trumpeted by both generations it would be unfortunate if this blinds us to the real challenge of using digital media, namely the potential for engagement with information and education content and for participation in online activities, networks and communities.

With this in mind it is worth reconsidering briefly the functions and roles that can be played by formal institutions (such as schools, libraries, museums) and information professionals (especially librarians, teachers and other information specialists) in realistically supporting young people's engagement with digital technologies and digital information. In the first instance it seems clear that educational and civic institutions continue to have an important role to play in providing young people with equitable levels of access to digital technologies, in terms of hardware, software and connectivity to the internet and other telecommunications networks. Furthermore, there would still appear to be a need to ensure equitable access to content and services which are relevant to the different information needs and contexts of children and young people. A key area for debate here are the relative virtues of "top-down" provision of information and services for young people as opposed to the "bottom-up" creation of content by young people. It is clear that many children and young people will continue to require support in the creation and communication of content, with many still lacking the experience, confidence or motivation to be involved in the process of designing, implementing and evaluating self-created content. Thus a number of questions remain over how young people can be best included in the design process of digital information, not only in terms of information interfaces but also content structures (see Bar-Ilan and Belous, 2007).

Adults would therefore seem to have a continued role in supporting young people's use of technology and information, not least in ensuring that the social contexts surrounding digital information allow young people to be informed about their choices. Of course, many of the research findings in this area point towards "the need for additional training" of young people with regards to digital information (Bilal, 2004, p. 275), and addressing the "chasm" that is felt to exist between "the rather basic needs" of children and young people and "the complexity of the [information] resources" they use (Chelton and Cool, 2004, p. x). Yet rather than concentrate solely on the technical training of young people, efforts also need to be made to explore the ways in which "critical digital literacies" can be developed. As Buckingham (2007, p. 144) argues, within schools and other civic institutions there is perhaps a need to "place a central emphasis on developing children's critical and creative abilities with regard to new media", therefore promoting "a form of 'digital media literacy' as a basic educational entitlement". Aside from schools, organisations such as public service broadcasters, internet service providers and other youth media providers also have distinct roles to

play in engendering young people's critical engagement with digital media and digital information through their content provision and interactions with users.

Aside from these forms of institutionally provided support there are also clear opportunities for information professionals to support young technology users. As our brief review of the research literature suggested, the increasing complexity and sophistication of digital technologies brings "significant distractions and obstructions" that young people must confront (Crook, 2008). In this sense, teachers, librarians, parents and others can play important roles in managing young people's experiences of using digital technologies, and supporting their attempts to apprehend the structures and meanings of digitally-based information (Ljoså, 1998). Therefore, adults can assume joint responsibility for the goals and methods of young people's interactions with digitally-based information, supporting self-directed activities and providing the initial impetus for collaborative activities that underpin digital information use and digital scholarship (Rosenblum, 2008). For instance, in the case of Web 2.0 tools, there is ample scope for the orchestration of collaborative and communal activities, with interested adults supplying the "good core" and "initial governance and impetus" that lies at the heart of any effective open collaboration (Leadbetter, 2008). This is not to suggest a wholesale move from teachers, librarians and other information professionals being "sages on the stage" to "guides on the side", or else having to assume the mantle of being role models and "gurus" of best technology practice as some may suggest (Sreenivasulu, 2000). In particular, as Young and Muller (2009, p. 7) contend, it would be unwise to over-valorise the value of individually-led informal activities at the expense of formal provision:

[...] as learners cannot actually "construct" their own learning (because, in Foucault's pithy phrase, they cannot know what they do not know) the role of teachers cannot be reduced to that of guide and facilitator rather than as a source of strategies and expertise.

In this sense, teachers, librarians and others still have a valuable authoritative role in educating, informing, managing and directing the technological activities of children and young people.

## Conclusions

Whilst there is an obvious need to remain mindful of the changing information and technological "lifeworlds" of children and young people, it is clear that we would do well to avoid the excesses of the digital native debate and instead concentrate on enhancing our understandings of the realities of technology use in contemporary society. Whilst digital technologies are associated with significant changes in the lives of young people and adults, there is little reason to assume that serious and irrevocable disconnections are somehow resulting between young people and society. As has been reasoned throughout this paper, there are few ways in which the current "digital native" generation can be said to constitute a total disjuncture and discontinuity from previous generations. Thus as Mimi Ito *et al.* (2008, p. 4) conclude, we should be "wary of claims that a digital generation is overthrowing culture and knowledge as we know it and that its members are engaging in new media in ways radically different from those of older generations".

With these thoughts in mind, we should remain especially mindful of the wider political and ideological agendas underlying the persistence of the digital native

discourse in society, not least some commentators' use of the plight of "the child" as a metaphor for wider issues, causes and agendas (Jenkins, 1998). Indeed, the digital native debate is just one of a number of public concerns over young people that refer to wider concerns over the problematic nature of societal change across the life-course – from declining levels of health and education, to increasing levels of violence, crime and other forms of moral degradation. In this respect the notion of the "digital native" could be welcomed as providing a ready rhetorical space for the expression of adult concerns over current developments in digital technology. Yet there is a very real danger that if these rhetorical stories continue to be taken at face value and conflated with the realities of young people's technology use, then they can only provide an ill-informed and realistic basis for the formation of effective policymaking and practice.

With these thoughts in mind, there is a clear need for all parties concerned with young people and technology to maintain a balanced and objective perspective on what can appear at first glance as a substantial transformation of social relations. We therefore hope that the critical lines of analysis pursued in this paper prompt information professionals and educationalists to approach the digital native literature with caution. Whilst inter-generational tensions and conflicts have long characterised popular understandings of societal progression, adults should not feel threatened by younger generations' engagements with digital technologies, any more than young people should feel constrained by the "pre-digital" structures of older generations. The onus perhaps now falls on academic communities of information scholars and other social scientists to better promote empirically-grounded and socially-aware portrayals of the complexities of young people's uses of technology – thus providing realistic alternatives to the discourse of the digital native and the attendant public and political concerns that surround it.

#### Note

1. In developing a critical analysis of the "digital native" literature, we are not referring solely to Prensky's work, but also the large body of writing that has followed subsequently on the same theme. In particular our analysis includes work by Tapscott, Palfrey and Gasser, as well as recent writing on Web 2.0 from Keen and Leadbetter.

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