

Educating the 'Digital Natives'?

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Introduction

Many of the popular debates in education and technology are focused on the concerns of teachers and educational institutions rather than the concerns of learners. As we have seen in previous chapters, educational institutions and the educators who work within them are certainly important aspects of education and technology. Yet as the eventual 'end users' of most educational technologies it could be argued that the concerns of learners are equally as important. With this thought in mind we shall now go on to consider the ways in which digital technology use and formal education fit into the lives of

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learners. As will soon become apparent, this is a particularly important issue when thinking about current generations of young learners who have known nothing other than a life surrounded by digital technology.

For many educational commentators and practitioners the relationship between learners and technology is often assumed to be a fairly straightforward affair. This is especially the case with the current cohorts of young learners attending school, college and university. Most teachers (even those not long into their twenties and thirties) will happily concede that digital technology is an integral part of the lifestyles of current generations of learners in ways that often are not the case for people of their own age. Indeed, some adults could be said to be slightly in awe of young people's apparent comfort with technological artefacts and technology-based processes. These feelings are also expressed within academic circles. Since the turn of the twenty-first century growing numbers of academic commentators have been describing young learners as 'digital natives' and members of the 'net generation'. Such labels have proved to be highly influential in shaping contemporary public, political and professional expectations of the technological capabilities and demands of those learners who were 'digitally born' in the 1990s, 2000s and now 2010s (Seely-Brown 2008).

Terms such as 'digital native' reflect a growing belief that young people's uses of technologies in everyday life are supporting and facilitating a set of rather different practices and dispositions than was the case for previous generations. A popular characterization of upcoming generations of school and college students is that they have all grown up in a world of computers, the internet and mobile telephony. In short, they have experienced no other way of living – leaving digital technologies to be 'so commonplace as to be unremarkable' (Plowman et al. 2010, p. 135). As a result these young people are seen to lead lifestyles that are reliant upon the benefits of digital media. In particular, today's generations of technologically attuned students are seen to be immersed in digital cultures of technology-supported creativity, collaboration and communication. Crucially, digital natives are seen to expect these characteristics to be woven into all aspects of their lives – including the ways in which they learn and are educated. These changes could have profound implications for education and educators. As commentators such as Marc Prensky (2001, p. 1) have been warning since the start of the twenty-first century, 'our students have changed radically. Today's students are no longer the people our educational system was designed to teach.'

In one respect these descriptions and assumptions about the technology-driven lives of young learners are highly comforting to educators. Concepts such as the digital native provide adult educators with plausible explanations of why they may feel a distinct sense of technology-related disconnection from their students. These descriptions also provide a rare instance in public debate where children and young people are talked about in a generally positive and empowered manner. Yet these descriptions are also highly challenging to current educational arrangements. As Prensky's warning implies, the notion of the digital native suggests that educators are out-of-touch with those who they teach. It also suggests that formal educational institutions as they currently stand are irrelevant to the ways in which young people would prefer to be learning.

With these thoughts in mind, we should perhaps take a closer look at the assumptions that surround young learners and technology in the twenty-first century. Can it really be said that current cohorts of learners have an affinity with digital technology in ways that older generations do not? How realistic are popular assumptions of young people's actual uses of digital technology? Perhaps most importantly, is it accurate to say that current generations of high-tech learners are finding themselves disconnected and disengaged from their schools, colleges and universities? If so, what relevance and roles do educators and educational institutions have in supporting learners in the digital age? In order to address these questions, we first need to consider the assumptions being made about young people, learning and digital technology in more detail. Just what exactly is meant by the 'digital native' and the 'net generation'?

Deconstructing the 'digital native'

The term 'digital native' derives from a series of articles written from 2001 onwards by the US technologist Marc Prensky. Throughout the 2000s Prensky's writing received growing attention in education and technology circles through its persuasive descriptions of the generation of young people born since 1980. Prensky labelled these children of the 1980s and 1990s as 'digital natives' due to what he reckoned to be an innate confidence in using new technologies such as the internet, video games, mobile telephony and 'all the other toys and tools of the digital age' (2001, p. 1). Rather than using

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these technologies merely as part of their everyday lives, Prensky reasoned that digital technology was essential to these young people's existence. Digital natives were therefore depicted as being constantly 'surrounded' and 'immersed' by these new technologies in ways that older generations could never be. Recently, Prensky (2008) has argued that this permanent state of technological immersion and dependence can be seen in the lifestyles of upcoming generations of 'i-kids' – that is, children and young people who remain 'plugged into' portable, personalized devices such as mobile telephones, mp3 players and hand-held games consoles.

Prensky's relentless chronicling of these digital 'tribes' typifies a fast-growing body of commentary from around the world that seeks to make sense of the distinct technological cultures and lifestyles of current generations of children and young people. The US author Don Tapscott, for example, reaches a number of very similar conclusions to Prensky, marvelling at the high-tech activities and expectations of the 'net generations' of young people growing up during the 1980s, 1990s and 2000s (2008). Other authors have elaborated upon the digital native definition – identifying the phenomenon across most (if not all) sections of society and everyday life. As Palfrey and Gasser (2008) describe:

You see them everywhere. The teenage girl with the iPod, sitting across from you on the subway, frenetically typing messages into her cell phone. The whiz kid summer intern in your office who knows what to do when your e-mail client crashes. The eight-year-old who can beat you at any video game on the market – and types faster than you do, too. Even your niece's newborn baby in London, whom you've never met, but with whom you have bonded nonetheless, owing to the new batch of baby photos that arrive each week. All of them are 'digital natives'. They were all born after 1980, when social digital technologies, such as Usenet and bulletin board systems, came online. They all have access to networked digital technologies. And they all have the skills to use those technologies. (Except for the baby – but she'll learn soon enough.)

Such descriptions are certainly compelling and often presented in an extremely slick and seductive manner. Indeed, much of the language used to describe digital natives is closer to the branding that would be employed in advertising or marketing campaigns than serious academic debate. For example, readers are informed that these learners are the 'generation digital' that were 'born to be wired' (Montgomery 2007) and who 'grew up bathed in bits' (Tapscott and

Williams 2008, p. 47). A host of commentators write persuasively of computer games obsessed 'homo zappiens' (Veen and Vrakking 2006) and 'net savvy' youth (Levin and Arafeh 2002). 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 the new 'millennial learners' (Greenhow et al. 2009). All of these popular accounts neatly depict a distinct but common step change in the ways in which contemporary forms of childhood, adolescence and young adulthood are now centred on digital technology and media.

In particular, these descriptions share a common assumption of generational difference and divide. While varying in their precise detail, all these accounts confer a number of characteristics onto current generations of children and young people that set them apart from their elders – not least a 'hard-wired' and 'innate' affinity with digital technologies (Fisher and Baird 2009). Such accounts convey a sense of digital technology being an almost natural condition under which young people conduct their lives. For example, 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' (Alvermann 2004, p. 78). Indeed, in reference to the post-baby boomer 'generation X' and 'generation Y', some commentators write 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).

While many of these descriptions focus on what children and young people can do with digital technologies, other authors see generational difference as being most distinct in terms of attitude and disposition. At the beginning of the 2000s, Jason Frand (2000) identified an 'information-age mindset' prevalent within younger generations that was caused by growing up with digital technology and spending significant amounts of time with it. Some of the differences between the 'information-age mindset' and the mindset associated with a pre-digital age are relatively straightforward – that is, relying on multitasking rather than doing one thing at a time; preferring typing over handwriting; the essential nature of staying connected; having little or no tolerance for delays; and perpetuating the ever-blurring boundaries between being a consumer and being a creator. However, other aspects of the

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information age mindset are perhaps less obvious to older generations. As Frand (2000) goes on to conclude:

- *Computers are not technology* – young people have never known life without computers and the internet. To them the computer is not a technology – it is an assumed part of life.
- *The internet is better than TV* – due to issues such as interactivity, on-demand services and the increased use of the internet for socializing.
- *Reality is no longer real* – those things that appear real over the internet may not be.
- *Doing is more important than knowing* – knowledge is no longer perceived to be the ultimate goal. Results and actions are considered more important than the accumulation of facts.
- *Learning more closely resembles Nintendo than logic* – computer games such as Nintendo symbolize a trial-and-error approach to solving problems; losing is the fastest way to mastering a game because losing represents learning. This contrasts with previous generations' more logical, rule-based approach to solving problems.

Implications of the digital native argument

At first glance all of these explanations and analyses appear highly plausible and persuasive. Significantly, many of these descriptions chime with the personal experiences of educators, parents and other adults. It is likely, for example, that most readers of this book will personally know children and young people in their lives who appear to conform to every aspect of the digital native description. Yet as was hinted at the beginning of this chapter, these concepts are not simply descriptive labels. Concepts such as the digital native and net generation convey a sense of distinct difference between young learners and their (older) educators. These differences in turn imply a series of 'disconnects' between the ways that digital natives go about their business and the manner in which the world is still controlled largely by older generations. As far as many of the commentators highlighted so far in this chapter are concerned, these disconnects, frictions and clashes are especially apparent when it comes to education and learning. In particular these descriptions of the digital native point to at least three potentially problematic issues for education in the twenty-first century: incoming generations of young learners who are now empowered by digital technologies; generations of older educators

who are increasingly distanced from those who they teach; and an increasing disconnection between young learners and the educational institutions that they are expected to learn in.

The empowered 'digital native'

For many adults, the most notable trait of the digital native condition is the fast and flexible lifestyles that digital technologies appear to support. Due largely to their seemingly constant use of technology, young people are described 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 terms, with children and young people seen to be free to choose who they interact with, when and for what purposes. In this way digital natives are felt to benefit from an individualization of everyday life that is built around their digital technology use. Internet tools and applications are seen to give young people an enhanced ability to build and maintain connections with various formal and informal components of their lives – what is often described as the 'personalization' of activities and services. As was implied in Chapters 6 and 7, the internet-connected young learner is often celebrated as being no longer being 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 (Green et al. 2006).

In particular, digital technologies are seen to play a key role in enhancing young people's control over the nature and form of what they do, as well as where, when and how they do it. Digital natives are often portrayed as far more socially autonomous than previous generations. Much has been written, for example, about the significance in young people's lives of internet-based communal action through applications such as social networking, wikis and virtual worlds. Children and young people are described as a 'collaboration generation' (Tapscott and Williams 2008, p. 47), eager to use digital technologies for working together towards common goals, sharing content and drawing upon 'the power of mass collaboration' (Leadbeater 2008, p. 36).

This combination of individual autonomy and the power of collective action is seen by some adult commentators to give young people an enhanced capacity to question, challenge and critique all aspects of their lives. The digital native generation is therefore described as one that 'typically can't imagine a life where citizens didn't have the tools to constantly think critically, exchange

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views, challenge, authenticate, verify, or debunk' (Tapscott and Williams 2008, p. 47). The highly sociable but inherently sceptical worldview of the digital native is portrayed as giving children and young people the propensity to construct alternatives to the core values of the traditional institutions and structures of previous generations. Instead of kowtowing to the linear requirements and restrictions of institutions such as schools or broadcast media channels, for example, young people are described as being more than capable and confident of self-organizing 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'.

These traits are felt to span all aspects of young people's lives – from leisure and entertainment to politics and civic engagement. Yet these descriptions of the empowered digital native are felt to resonate especially closely with education and learning. In particular, much attention is given within the digital native literature to the technological transformation of young people's capabilities for learning and processing information. Marc Prensky, for example, has written extensively about the technology-induced capacity of current generations of young people to 'think and process information fundamentally differently from their predecessors' (2001, p. 1). It is argued that digital natives now have a technologically enhanced ability to learn at high speed, make random connections, process visual and dynamic information and learn through digitally based play and interactions. As Prensky (2008, n.p.) speculates in characteristically forthright terms, 'within the working lives of our students, technology will become a billion times more powerful, likely more powerful than the human brain'.

Alongside these neurological and cognitive advantages, the ways in which young people now learn are seen to have been transformed by their ability to access vast digital networks of information, resources and people. Echoing many of the constructivist and socio-cultural theories outlined in Chapter 4, young people are felt to be now able to learn in ways that are increasingly 'situated' within authentic contexts and 'communities of practice'. In this sense, what young people learn and how they learn it is seen to have been transformed by digital technology, often in a manner that is far removed from the concerns of formal education institutions such as the school, college or university.

The disempowered 'digital immigrant'

Of course, all these depictions of the empowered digital native imply a range of corresponding changes for the adults in their lives. In particular, these depictions of the digital native are often based around a corresponding disempowerment of older generations. At the same time as writing about the digital native, Prensky (2001) also labelled adults born before 1980 as 'digital immigrants'. The 'immigrant' tag was intended to describe the predicament of adults who had been forced to adapt to a world of digital media after (many) years of leading 'pre-digital' lifestyles. This distinction has since been expanded to also reflect the tendency for adults to lack the seamless technological fluency of younger digital natives and to often find many of their skills unfamiliar and even 'foreign' (Long 2005). As Prensky (2005, p. 8) summarizes:

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.

This is not to say that all adults are consigned automatically to a state of technological incompetence and bewilderment. Much has been written, for example, about the high-tech activities of some older adults – the tribe of so-called silver surfers (Raptis and Dick 2007). Similarly, Palfrey and Gasser (2008) acknowledge the existence of groups of technology-minded younger adults. These are adults 'who were there at the start' of the digital era, but still suffer from having spent their formative years in an 'analogue only world'. As Palfrey and Gasser concede, these so-called digital settlers often play a key role in helping 'shape the contours' of digital technology – not least by designing and producing the technologies that younger people are seen to innately understand. Nevertheless, by dint of their 'analogue early-years' even these adults will never be *truly* native to the digital environment. As Palfrey and Gasser conclude, 'these older people are online, too, and often quite sophisticated in their use of these technologies, but they also continue to rely heavily on traditional, analogue forms of interaction.'

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All of these accounts convey a distinct division between ‘the generations who grow up with these ways of thinking’ (Leadbeater 2008, p. 20) and the ‘often web-illiterate’ adults in their lives (Keen 2007, p. 207). As should already be apparent, the consequences of these intergenerational tensions tend to be presented by adult commentators in dichotomous terms of ‘them’ and ‘us’. In this sense, most digital immigrants are seen to be largely ‘out of the loop’ of technological change, leaving little opportunity for adults to alter their practices or modes of provision to fit 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 activities (Lankshear and Knoebel 2004). As Don Tapscott concludes, the digital natives’ ‘appetite for authenticity’ means that they are often ‘resistant to ill-considered attempts by older generations to “speak their lingo”’ (Tapscott and Williams 2008, p. 54).

As far as many commentators are concerned, fundamental changes are therefore required to the roles that adults play in young people’s lives. Underpinning many of these suggestions is a belief that young people should be given far greater control of their interactions with information and knowledge. In terms of education, for example, Prensky (2008, p. 1) argues for a ‘new pedagogy of kids teaching themselves with the teacher’s guidance’. This sense of allowing young people the opportunity to determine the direction of their own learning is reflected in Don 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’.

The redundant pre-digital institution

As these last points suggest, the idea of the digital native carries a range of implications for the institutions and organizations that seek to work with children and young people. Indeed, many commentators link the rise of the digital native with the ‘death of school’ arguments outlined in Chapter 7. As Prensky has been given to predict, ‘the demise of the classroom itself, replaced by a combination of online group activities, telepresence and other things, is not far’ (2007, p. 64). In this sense, many of the structures of the digital immigrant world are felt to be increasingly incompatible with the needs and demands of young people. Schools, libraries, universities, museums and other institutions have all been argued to face a growing ‘legitimacy crisis’ with

younger generations (Kenway and Bullen 2005). In particular, the digital native way-of-being is seen to clash with the formal *and* informal organization of such institutions. This is especially the case in relation to the linear and hierarchical ways of structuring communication, learning and access to knowledge. As Ulbrich et al. (forthcoming) contend:

Members of the net generation use the web differently, they network differently, and they learn differently. When they start at university, traditional values on how to develop knowledge collide with their values. Many of the teaching techniques that have worked for decades do not work anymore because new students learn differently too. The net generation is used to network; its members work collaboratively, they execute several tasks simultaneously, and they use the web to acquire knowledge.

As this depiction implies, formal educational institutions such as the school, college and university are seen to be poorly placed to deal with the social, cultural and economic changes associated with young people's digital technology use. In particular, growing numbers of commentators are highlighting what they see as a fast-growing 'digital disconnect' between young learners and their education institutions. Schools, colleges and universities are seen to offer young people increasingly regulated and constrained digital experiences that are decidedly limited in terms of resources, relevance, time and support. As Levin and Arafeh (2002, p. ii) wrote at the beginning of the 2000s:

students report that there is a substantial disconnect between how they use the internet [at home] and how they use the internet during the school day and under teacher direction. For the most part, students' educational use of the internet occurs outside of the school day, outside of the school building, outside the direction of their teachers.

The continuation of these trends into the 2010s has prompted some commentators to warn of a wider disconnection among technology-using learners from the overall experience of formal education. The long-held fear of technology-driven 'aliens in the classroom' (Green and Bigum 1993) has gained momentum in the past 20 years. Now a number of recent academic studies are claiming to document a burgeoning technology-related disenchantment among current cohorts of students. High-tech learners are said to be disaffected, disconnected and alienated from their formal education experiences

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in ways similar to the alienation of factory workers from their workplaces. As one study of Australian high-school students was led to conclude:

all groups [of students] spoke of a Taylorist kind of environment, where busy work dominated and a fragmented, disconnected curriculum took away any ownership that they might have over the technology and their work. At home, students were independent. Most could create, fix, download and shape how, when and why they used technology. At school, they had to submit to a regime of dependence – on teachers, old technology, disheartening activities and, in the main, tired old pedagogies. (Reid 2009, p. 299)

Questioning the logic of the digital native argument

These depictions of the technologically driven lifestyles of young people have proved to be highly influential within popular, political and scientific discussions. Because of their distinctly ‘commonsensical’ nature, ideas about digital natives now feature regularly in the thoughts and pronouncements of policymakers, technology vendors and opinion formers throughout the world. Yet there are many reasons to question the validity of these common-sense assumptions. In particular, these twenty-first-century portrayals of young people and digital technology have remarkable similarities to representations of previous generations of young people. Throughout the twentieth century, for example, similar warnings were made regularly about the alienating effect of the ‘new’ technologies of the time such as film, radio, television, comic books and pulp fiction. In the 1960s, for instance, Marshall McLuhan (1964) wrote persuasively of the apparent disconnection experienced between static print-based education and a generation of young learners immersed in radio, television and popular media culture. As such, we would do well to remember that societies have long told intuitive ‘stories’ about technology-induced generation gaps and divides.

Yet the ease with which these intuitive and commonsensical ‘stories’ of the digital native generation are being currently repeated and ‘retold’ should prompt some suspicion. While the past ten years have undoubtedly witnessed significant changes in the technological practices and predilections of children, young people and young adults, it may be sensible to reconsider the

status of the 'digital native' as a *prima facie* account of young people's lives in the early twenty-first century. After all, twentieth-century warnings of 'comic book kids' and the 'video nasty' generation proved to be far less significant than was feared at the time. Just how accurate is the 'digital native' literature in reflecting the current realities of young people's actual engagements with digital media and technology?

If we look back to the issues raised in Chapter 2, then a number of potential problems with the digital native argument come quickly to mind. In particular, much of the digital native commentary can be criticized for its technologically determinist view of societal change. Many of the descriptions of digital natives appear to be rooted in the idea of digital technologies being imbued with a range of inherent qualities that then 'impact' (for better or worse) on young people in ways that are consistent regardless of circumstance or context. Similarly, many of the arguments and assumptions outlined so far in this chapter are also based on what can be described as a biologically essentialist conception of the 'child' and 'young person'. By seeing young people as somehow naturally and innately endowed with technical skills and aptitudes, many proponents of the digital native can be accused of failing to 'acknowledge the diversity of the lived experience' of both childhood and adulthood (Buckingham 1998, p. 556).

This criticism of 'lazy thinking' continues through to the idea that digital natives somehow constitute a distinct generation or cohort. Indeed, descriptions of the digital native reflect a wider tendency in society to imagine social change in terms of generations. A number of problems exist in such analyses – not least that the notion of a 'generation' is a purely social construction based on arbitrary timeframes and benchmarks. In this way the idea of the digital native falls foul of many of the 'positivist' tendencies of generational analyses. For example, as Julian Marias (1949) argued, the broad-brush description of a particular 'generation' often ignores minority and less visible groups, and fails to account for rebel individuals or 'elite minorities' within generational groups. As Karl Mannheim also reasoned, generations tend to reduce history to 'a chronological table', often underemphasizing the qualitative experience of the individual and underplaying the importance of social context. As Mannheim noted, in reality any generation can contain 'a number of differentiated, antagonistic generation-units', making any broad generalizations about a particular 'generation' lack authority or accuracy.

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With all these questions and caveats in mind, there are a number of reasons why we may suspect the idea of the digital native to provide a rather inaccurate and partial account of young learners and technology. If nothing else, there are certainly grounds to challenge claims that the digital native foretells the death of the school or the disconnection of young people from education. While often compelling and persuasive, it could be said that the overall tenor of the claims from writers like Prensky, Palfrey and Tapscott tend more towards exaggeration and hyperbole rather than attention to objectivity and accuracy. It makes sense, therefore, to now consider the research evidence on young people, digital technology and education in further detail.

Considering the realities of young people's digital technology use

In contrast to much of the digital native commentary, empirical studies tend to portray a rather more complex and compromised picture of children and young people's uses of new technologies. For example, the idea that all young people are immersed in a state of constant access to technology is an obvious oversimplification – especially in light of Chapter 5's discussion of the continued digital divides that exist between and within different countries around the world. Instead, research studies suggest that the ability of young people to access digital technologies remains patterned strongly along lines of socio-economic status and social class. Clear differences are also apparent in terms of gender, geography and the many other entrenched 'social fault lines' which remain prominent in early twenty-first-century society. Indeed, some social groups of young people appear to be as 'digitally excluded' as older generations, albeit in ways which are less apparent to adult commentators (see Selwyn and Facer 2009).

For instance, recent studies across Europe and North America show that levels of computer and internet use are often lower among 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 a key influence on the technological needs, interests and practices of children and young people. This is made clear if we consider cohorts of young people born since 2000 – the so-called millennials. The social, cultural and cognitive backgrounds of a 3-year-old child are very

different to those of a 7-year-old. In turn a 7-year-old has very different social, cultural and cognitive backgrounds to a 11-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 growing evidence that many young people's actual uses of digital technologies remain rather more limited in scope than descriptions of the empowered digital native would suggest. Surveys of adolescent technology use, for example, show a predominance of games playing, retrieval of online content, text-messaging and communication via social networking sites (Crook and Harrison 2008, Luckin et al. 2009, Lenhart et al. 2007). The most popular technology practices of younger children are often relatively simple and repetitive, centred on writing and image creation, as well as games playing (Selwyn et al. 2010). 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. Whether young people have an information-age mindset or not, the linear narratives of books, magazines and comics continue to be popular across all age groups – as is clear through the success of series such as Harry Potter, Twilight, manga and the like.

So, while some commentators may like to imagine digital natives engaging in collaborative communities of digital content creation and frenetic interaction, in reality many young people's engagement with technology is often far more passive, solitary, sporadic and unspectacular (Livingstone 2009). If anything young people's uses of digital technology can be described as involving the passive consumption of knowledge rather than the active creation of content (Chu 2010). This is especially the case in terms of learning with technology. Studies of technology-based informal learning often find digital technology use leading, at best, to what Charles Crook (2008) terms a 'low bandwidth exchange' of information and knowledge, with most instances of technology-based collaboration between groups of learners described more accurately in terms of co-operation or co-ordination between individuals. Similarly, use of digital technologies for information gathering can be described more accurately as passive information retrieval rather than active inquiry (Williams and Rowlands 2007). In short, for many children and young people, technology use at home or at school remains rather less

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expansive and empowering than the rhetoric of the digital native would lead us to believe.

Writers such as Prensky, Tapscott and Palfrey also convey an innate expectation or even desire among digital natives to be constantly using digital technologies. Instead, research studies suggest that young people are rather more discerning in their desire to use (and not use) digital technologies. For example, there is a growing body of evidence of young people's ability to self-regulate their use of digital technologies. This was evident, for example, in Danah Boyd's recent ethnographic study of social networking sites among US teenagers. As well as documenting the activities of regular users of such sites, the study also highlighted groups of 'conscientious objectors' and refuseniks. These were either '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' (Boyd 2007, p. 3).

These research findings, and many others like them, highlight the need to recognize the significance of context and circumstance in young people's (non-)use of technology. The importance of context is illustrated, for example, in studies of young people's information seeking behaviours. Here, researchers have found that young people's use of digital information is often contingent on the nature of 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 use digital sources to seek information about sports, humorous content and entertainment, but less likely to look for information pertaining to health, medical care, religion or travel (Dutton and Helsper 2009, Pew 2005). Tellingly, searching for 'information on a topic that is hard to talk about' has been found to rank as one of the least popular internet activities for teenage internet users (Pew 2001).

Findings such as these suggest that we should not overlook the wide range of non-technological sources that children and young people continue to draw upon to live their lives, such as intimate personal networks with friends and peers, wider networks of family and community contacts and mass media sources. Indeed, a recurrent finding from the research studies of young people's information behaviour is the sustained importance of face-to-face conversations (Wells and Dudash 2007). As such we should remain mindful of the continued significance of 'pre-digital' means of interaction and action as much for digital natives as for older generations.

It should be clear from these brief examples alone that many of the claims made for the 'digital native' generation offer speculative rather than authoritative accounts of twenty-first-century children and young people. There is also little specific evidence, for instance, that young people are any more disaffected or disengaged from their schools, colleges or universities than they were before. Instead of finding evidence of a growing 'digital disconnection' or obviously new sources of disaffection between children and their schools, research on students and technology tends to report a rather less fractious state of compliance. If anything, school, college and university students continue to be relatively accepting of the rules, regulations and restrictions of their institutions. Many young people are distinctly circumspect and 'school savvy' when it comes to understanding what they can and cannot do with digital technology. Rather than outright rebellion, the majority of young people learn to 'go with the flow' when necessary and 'make the best of a bad lot' – just as their parents' and grandparents' generations did before them. From this perspective, concerns over the alienated and angry 'digital natives' and irrelevant and obsolete pre-digital educational institutions may be rather wide of the mark. Any problems that do exist currently between young people and formal education are unlikely to stem directly from digital technology. As Sue Bennett and colleagues (2008, p. 782) argue:

The picture beginning to emerge from research on young people's relationships with technology is much more complex than the digital native characterisation suggests. While technology is embedded in their lives, young people's use and skills are not uniform. There is no evidence of widespread and universal disaffection, or of a distinctly different learning style the like of which has never been seen before. We may live in a highly technologised world, but it is conceivable that it has become so through evolution, rather than revolution. Young people may do things differently, but there are no grounds to consider them alien to us. Education may be under challenge to change, but it is not clear that it is being rejected.

Perhaps the most telling empirical rejoinder to the concept of the digital native comes from national surveys of digital technology use. These surveys allow for the comparison of young people's technology use to the patterns of technology use of older, adult generations. One recent example of this was Helsper and Eynon's (2010) analysis of data from the nationally representative UK Oxford Internet Survey. These data showed that factors such as having a

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high income, high level of education, and a breadth of digital technology experience were ‘just as, if not more, important than age in explaining how people become digital natives’ (Helsper and Eynon 2010). At best, this study concluded that generational labels were ‘just one often secondary influencing factor’ in using explaining the extent to which people can be defined as leading a ‘digital native’ style lifestyle. As the authors concluded, ‘the evidence provided suggests that it is possible for adults to become digital natives, especially in the area of learning, by acquiring skills and experience in interacting with ICTs’ (Helsper and Eynon 2010).

Recognizing the need to support and guide young people’s technology use

The arguments and debates surrounding education and the digital native should remind us of the dangers of conflating common-sense assumptions and personal experience with generalizable ‘fact’. While most readers of this book will have personal experience of young people who can do extraordinary things with digital technologies, this should not prompt presumptions of universal change. Indeed, alongside spectacular digital practices by some young people in some circumstances, a picture of rather less spectacular technology use emerges from studies of many other children and young people. In this respect young people’s engagements with digital technology appear to be as varied and divided as any other aspect of their lives. Some young people undoubtedly do make extensive use of digital technology, and some undoubtedly do rely on digital technologies as an important part of their lives. Yet it would seem wrong to assume that all young people are making extensive, expansive and high-quality use of digital technology all of the time.

It is therefore erroneous to assume that educators and educational institutions face an imperative to ‘catch-up’ with young people’s skills and competencies. Indeed, it would seem that adults are just as likely to have developed an ‘information-age mindset’ or close affinity with digital technology. In his more recent writing Prensky has begun to acknowledge the declining distinctions between generations – reasoning that in time we will all simply become ‘digital humans’. While this analysis is itself prone to oversimplification and determinism, it does suggest that divides between generations are of less

importance than divides between different groups of people. Prensky himself states that differences in the 'wisdom' with which digital technologies are used by different groups of people will become increasingly important. As Prensky (2009, n.p.) concludes, 'as we move further into the twenty-first century when all will have grown up in the era of digital technology, the distinction between digital natives and digital immigrants will become less relevant'.

So, on the basis of the evidence considered in this chapter it is perhaps sensible to move away from presuming a gap between older educators and younger students, and instead think of where and how teachers and education institutions can support and enhance young people's uses of technology. On one hand, as Helsper and Eynon (2010) observe, much of the digital native literature conveys a laudable message – that is, that 'we need to understand learners in order to teach them well'. Yet predictions of the impending obsolescence of teachers and schools seem difficult to substantiate when one considers the realities of technology use across general populations of young people. Instead, there is perhaps a greater need for adults to support and guide young people in their technology use. This echoes some of the conclusions reached in Chapters 6 and 7 – especially in terms of teaching young people how to use technology in ways that are perhaps more useful and expansive than they are using technology at present. As Sonia Livingstone (2009, p. 49) concludes:

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.

In particular it is beginning to be argued by some media educators that adults need to play a heightened role in supporting young people's use of digital technology, not least in ensuring that the social contexts surrounding digital technology allow young people to be informed about their choices. Ensuring that children and young people are informed about their choices and actions when using digital technologies has recently come to be referred to as the development of 'critical digital literacies' or 'new media literacies'. 'Critical digital literacy' can be seen as involving a lot more than just keyboard skills and awareness of internet safety. Instead, it involves helping children and young people develop a full range of creative abilities to make use of digital technology, alongside the critical understandings required to make best use

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of digital technology. Thus rather than concentrate solely on the technical training, it is beginning to be argued that efforts need to be made at all levels of education to support the development of individuals' critical digital literacies. As David Buckingham argues, within schools, universities and other civic institutions there is a growing need to 'place a central emphasis on developing children's critical and creative abilities with regards to new media', therefore promoting 'a form of "digital media literacy" as a basic educational entitlement' (2007, p. 144).

In terms of these creative abilities, the shift from print to digital technologies is seen to have introduced the need for the development of 'multimodal' forms of literacy as meanings are made in a variety of ways other than print text and its linguistic elements. As Carey Jewitt argues, 'what it means to be literate in the digital era of the twenty-first century is different than what was needed previously' (2005, p. 330). A number of commentators have outlined the ways in which the media literacy of children and young people could be improved along these multimodal and multimedia lines. Henry Jenkins, for example, proposes a list of 'new literacy skills' to consider in thinking about how educators can teach students to approach digital technology (2005):

- *play* – the capacity to experiment with one's surroundings as a form of problem-solving;
- *performance* – the ability to adopt alternative identities for the purpose of improvisation and discovery;
- *appropriation* – the ability to meaningfully 'sample' and 'remix' online content;
- *collective intelligence* – the ability to pool knowledge and compare notes with others towards a common goal;
- *transmedia navigation* – the ability to follow the flow of stories and information across different forms of digital technology;
- *networking* – the ability to search for, synthesize and disseminate information.

Besides these creative skills, perhaps the most important capacity that children and young people should be encouraged to develop is a critical thinking about digital technology itself. The area of creative thinking is a growing part of school curricula, and it could be argued that the development of better critical understandings of digital technology underpins the success of all forms of technology-based education. As Kay Withers notes, 'the success of self- and co-regulation relies on users themselves being able to make informed decisions: being "media literate" in the way they access and use content and

information' (2008, p. 51). In this sense, it is now being argued that educators help children and young people question and challenge the place of digital technology in their everyday lives. A critical thinking approach would be an ideal means, for example, of helping children and young people to get to grips with the many non-technical challenges and issues associated with using digital technologies – not least issues such as discerning the authenticity and academic authority of online information and 'facts', as well as issues of 'privacy' and 'trust' when using the internet. These additional complex aspects can all be addressed by having a critical conception of what it means to be literate and skilled in the twenty-first century.

Conclusions

With all these thoughts in mind, there would seem to be little reason to extrapolate young people's apparently 'different' use of digital technologies into grounds for a wholesale re-engineering of the education system. Instead, as with many of the issues discussed so far in this book, it is necessary to be mindful of the ideological basis of many of the claims made for new generations of digital natives. Indeed, many of the authoritative accounts and arguments from the likes of Prensky, Tapscott and Palfrey gain credence not from any empirical substance or accuracy but from their associations with wider ideological debates and 'moral panics' over young people in the early twenty-first century. Much of the writing and commentary on the 'imperatives' of the digital native deliberately reflects other ongoing moral and ethical debates around children, young people and society. As such, these authors' apparent concern with digital technology often masks their underlying interest in raising wider 'questions about the kind of society we want and the kinds of kids that we seek to raise' (Keen 2007, p. 154).

It would therefore seem sensible to treat the notion of the 'digital native' as a discursive rather than descriptive device. In other words these are arguments made by those seeking to exert some influence over the shaping of the digital (near) future. So while there is a clear need to remain aware of the changing technological lifestyles of children, young people *and* adults, there is little reason to assume that serious and irrevocable disconnections are somehow resulting between young people and society. As this chapter has shown, there are few ways in which the current 'digital native' generation can be said to constitute a total break from previous generations. As Mimi Ito

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et al. (2008, p. 4) conclude, we should therefore remain ‘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.’

Further questions to consider

- Why is the idea of the digital native so appealing and intuitive, despite its obvious limitations and inaccuracies? Why are so many people willing to suspend their critical faculties when it comes to discussing young people and technology?
- To what extent is the digital native debate a contemporary instance of a ‘moral panic’? Are these simply ‘scare stories’ about digital technology use? How is the digital native debate similar to concerns over young people and drug-taking, obesity and other societal anxieties?
- The digital native debate raises some interesting points regarding the influence of ‘nature’ and ‘nurture’ on technology use. What grounds are there for the seeing technology use and aptitude as due to innate biological factors? In what ways – if any – can children be said to be ‘hard-wired’ to use digital technologies in ways that their parents are not?

Further reading

Marc Prensky’s writing on the digital native is available widely online – here are some notable examples:

- Prensky, M. (2001) ‘Digital natives, digital immigrants’ *On the Horizon*, 9, 5, pp. 1–6.
- Prensky, M. (2008) ‘The role of technology in teaching and the classroom’ *Educational Technology*, 48, 6, November/December
- Prensky, M. (2009) ‘H. Sapiens digital: from digital natives and digital immigrants to digital wisdom’ *Innovate*, 5, 3, February/March

Two other authoritative overviews of the digital native and net generation arguments:

- Palfrey, J. and Gasser, U. (2008) *Born Digital: Understanding the First Generation of Digital Natives*, New York, Basic
- Tapscott, D. (2008) *Grown Up Digital: How the Net Generation is Changing Your World*, New York, McGraw-Hill

This article offers a critical perspective on the empirical evidence underlying the claims of Prensky and other digital native commentators:

- Bennett, S., Maton, K. and Kervin, L. (2008) 'The "digital natives" debate' *British Journal of Educational Technology*, 39, 5, pp. 775–786

This book provides an excellent overview of recent empirical and theoretical work on children, young people and digital technology:

- Livingstone, S. (2009) *Children and the Internet*, Cambridge, Polity

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