Digital participation, digital literacy, and school subjects

A review of the policies, literature and evidence

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About this review

This review aims to provide a critical introduction to the policies and research on the subjects of digital literacy and digital participation, seeking to show what they mean for classroom practice. Aimed at teachers and practitioners, especially those involved in continuing professional development programmes, and providers of teacher training or practice-based Masters courses, it reviews the major research and evidence on developing digital literacy and digital participation in the classroom. It highlights the fact that there is extensive theory, conceptual development and policy on digital literacy and digital participation, yet little evidence about how this can be translated into practice.

The review aims to support and enable practitioners to start developing informed strategies to promote digital participation in real school settings by introducing them to a range of debates and key concepts and by relating these concepts to practice. It should be used as the basis for supporting the development of teachers' professional knowledge and skills in the critical use of digital media and technology for learning and for the enhancement of the curriculum. Throughout, examples of existing and emerging practices are included as breakout boxes to illustrate the conceptual content.

The document supports Futurelab's Digital Participation project, a programme of research and development in collaboration with teachers in primary and secondary schools which seeks to model, trial and evaluate practical strategies for enhancing young people's digital literacy in the classroom and their development of digital participation for life.

For more details and related documents see:
www.futurelab.org.uk/resources.

1. The importance of digital participation

Digital technologies and new media are now prevalent in many aspects of day-to-day public and private life[1]. For some commentators this is a cause for celebration and for optimistic predictions about life, work and learning in a networked society[2]. Ensuring that everyone knows how to use new technology has even become an issue for government, largely to ensure the UK's economic competitiveness in an increasingly digital age[3]. Critics, though, have concerns about how technology and media are impacting negatively on human relationships, individual psychologies and the entire social fabric[4].

To be a 'digital participant' in the context of such changes and the debates shaping them means making informed use of digital technology and media in one's own life. It means recognising how technology and media offer opportunities for people to participate in new kinds of social activities, civic life, learning and work, and it also means recognising that technology and media must be challenged and questioned rather than accepted passively. For children and young people, already growing up in a world in which technologies and media are an everyday and familiar presence, it is especially important to become informed and educated digital participants, equipped with the capacities to be active in interpreting the world around them.

Participation is, however, a contested term. People can participate in a very wide variety of activities and social associations, whether through digital media or not. It cannot be assumed that participation in itself is a positive thing. What about participation in extremist politics? Or participation in consumer and celebrity culture? Questioning these forms of participation demonstrates the extent to which defining participation is a matter of making value judgements. When the subject of discussion is children and young people, is the argument for greater participation aimed at heightening their civic and political participation at a time when they are considered apathetic towards mainstream politics?[5] What might be the outcomes of focusing on young people's participation only to give them very few real opportunities to participate actively in civic life, in other words, to invite their increased involvement only to then take no notice of them?

In this review, we are focusing on digital participation as an entitlement for all young people in the emerging digital media era; an entitlement broadly conceived as the knowledge, skills and understanding that are required to be involved socially, culturally, politically, and economically in everyday life.

Formal education has a key part to play in preparing young people to participate in social life, learning and working in this increasingly dense landscape of technology and media developments. Just as school subjects provide young people with the knowledge and skills to make sense of their world - including its history, geography, religions, arts, languages and sciences - education should also supply the skills and knowledge to make sense of this digital media world. This is more substantial than claiming that schools need to make use of ICT to sustain the engagement and motivation of learners. It recognises that accessing information and knowledge through diverse technological and media forms affects learning itself. That is why it is becoming increasingly important to identify how digital technologies and new media can be synthesised into school subjects,

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[1] We use the terms 'digital technology' and 'new media' to refer to a wide range of technologies which store and transmit information in digital form. This includes computers, the internet and e-mail, mobile phones and other mobile devices and cameras, video games, and also 'Web 2.0' technologies, the label commonly applied to 'participatory' and interactive media which involve the user being able to generate and broadcast content (including blogs, wikis, and social networking sites).

[2] For a thorough review of the 'optimistic' literature of digital media and social change, see Selwyn, N (2009). Digital Native—Myth and Reality, New Information Perspectives, 61,4: 364-379. A draft of this paper is available online: www.scribd.com/doc/9775892/Digital-Native.

[3] Department for Culture, Media and Sport [DCMS] and Department for Business, Innovation and Skills [BIS] (2009). Digital Britain: Final Report (The Stationery Office). Note that our working definition of digital participation goes beyond these technical concerns.

[4] A popular critique is supplied by Sue Palmer, who suggests that childhood is being 'polluted' by the 'toxic' effects of 21st century media. See Palmer, S (2006). Toxic Childhood: How the modern world is damaging our children and what we can do about it (Orion Books); and Palmer, S (2007). Detoxing Childhood: What parents need to know to raise happy, successful children (Orion Books).

[5] Livingstone, S, Bober, M and Helsper, E (2004). Active Participation or Just More Information? Young people's take up of opportunities to act and interact on the internet. LSE Research Online. eprints.lse.ac.uk/396/1/UKCGOparticipation.pdf.

not as tools to make learning more efficient, but as resources that have the capacity to change the nature of what it means to learn school subjects.

The challenge is, then, to find ways of adapting and modifying the curriculum and teaching practice to meet learners' emerging needs in the emerging digital media context, rather than just to integrate new technology and media into the existing curriculum in order to ensure relevance or boost standards. If we view the school curriculum as a set of skills, knowledge and understanding organised to prepare young people for "a flourishing personal and civic life" then it follows logically that the curriculum must respond to the challenges and opportunities that digital media provide[6].

It is becoming more common to hear the term 'digital literacy' used when referring to the range of skills, knowledge and understanding that young people need to learn in order to participate fully and safely in an increasingly digital landscape. Developing digital literacy does not simply require the acquisition of skills in using ICT, but the development of one's knowledge about technology and media, the application of these tools and resources to subjects, and the understanding of the role of technology and media in the real world.

Throughout this document, we use the term digital literacy to refer to the skills, knowledge and understanding that are required for digital participation, and we focus on the ways in which schools can support young people to develop their digital literacy in order to become informed digital participants. That is not to say these terms, or our uses of them, are uncontested. Defining what it means to be digitally participative is currently part of major political and academic debates, with especially acute implications for educators and learners.

[6]   This quote and a series of detailed analytical discussions about the curriculum are provided in White, J (ed) (2004). Rethinking the School Curriculum: Values, aims and purposes. RoutledgeFalmer.

2. What is digital literacy?

As new technologies and media are used more and more in teaching and learning, as well as in the home and throughout social life, young people need to develop more than just their ICT skills; they need a broad digital awareness of the wider context in which technologies and media operate to wrap around these skills in order that they can participate in this increasingly digital world.

Consequently, there have been many recent attempts to define strategies for teaching and learning that take account of young people's need for skills, knowledge and understanding in the use of new technology and media. Often, this is called 'digital literacy'. This document begins by discussing digital literacy because possessing some degree of digital literacy is a factor in whether or not young people are able to be effective and critical digital participants.

So, what does 'digital literacy' really mean?

To possess 'literacy' in traditional terms means being able to read and write in the shared language of a culture. Digital literacy shares some similarities. It refers to the reading and writing of digital texts, for example being able to 'read' a website by navigating through hyperlinks and 'writing' by uploading digital photos to a social networking site. In this sense, digital literacy means the functional skills required to operate and communicate with technology and media.

It also refers to the knowledge of how technologies and media affect the world. The internet now makes it possible to look up information on almost any area of human interest in just a few moments. Doing so requires some simple operational skills, but more importantly it requires the ability to be analytical and evaluative about the knowledge that is available on the web.

In fact, what it means to acquire knowledge is now changing significantly. Knowledge is no longer always to be stored tidily in text books and encyclopaedias, but is often available for free by searching on certain key words. Different sources may offer different interpretations of the same data, or simply offer conflicting data about the same subject.

So digital literacy means knowing how technology and media affect the ways in which we go about finding things out, communicating with one another, and gaining knowledge and understanding. And it also means understanding how technologies and media can shape and influence the ways in which school subjects can be taught and learnt. In a dense landscape of information sources, communication opportunities, and tools for creating new digital objects, teaching and learning cannot be confined to pen and paper activities.

This means that learners and teachers need to make sense of how technologies can be used within subjects and to understand how such technologies affect what we know about those subjects. Already, technologies are changing the ways in which we engage with subjects like geography, English, and science. GPS systems, online hypertext narratives, and physics simulations and visualisations are all recent developments related to these subjects. Geography educators might now be asking how GPS technologies and interactive online mapping applications might affect geography lessons; science educators might recognise how interactive visual simulations can now make aspects of scientific enquiry possible that were not previously; and English teachers might now consider how online hypertext affects what it means to be a reader and a writer.

School subjects have always been and remain important in helping young people to make sense of the world around them. Developing the digital literacy of young people within school subjects recognises that as the world changes school subjects should too; not simply to keep up to date or to seem fashionable but because young people will need different kinds of skills, knowledge and understanding to develop their expertise in all of the subjects. Digital literacy is as much a key part of learning about history and learning how to study history, and learning about science and learning how to study science, as it is about learning about ICT and learning the skills of using ICT. Indeed, possessing digital literacy is an important set of life skills to complement and extend the skills and knowledge already taught in school.

It is important to note that focusing on digital literacy in school subjects does not necessarily entail making paradigmatic changes to teaching practice. Many of the skills that are a part of being digitally literate are taught by some teachers already, particularly critical questioning skills, and the skills of effective study and analysis.

The emphasis on digital literacy does, though, imply that teachers need to engage critically with the content of their own subjects. In an increasingly digital world the very status of subjects is changing. Science can now feature complex simulations of phenomena, and history education needs to take account of how visual images and internet communications have become increasingly important (though deeply problematic) as documentary sources in major recent historical events.

Focusing on the development of children's digital literacy therefore means that teachers are seeking to make more overt the ways in which technologies and media transform learners' engagement with subject content. It may also help teachers to find creative, effective and engaging ways to deliver the curriculum.

PRACTICE BOX: Making games

At a secondary school in Cambridgeshire, teachers from the English and media department run a module with Year 8 students on the analysis and production of computer games. The series of lessons aims to support learners to be able to 'read' or interpret the computer games they play and to 'write' their own games. This is much like the study of other kinds of texts in English. Students in English regularly create their own versions of certain types of texts, such as poetry, prose and newspaper articles.

The approach taken to studying computer games during the lessons is to focus on both the 'critical consumption' of games and the 'creative production' of games. For the critical component of the course, students study how the computer games industry operates, how games are marketed to particular audiences and how the design of a game influences the ways in which players engage with it. Students also study how character, genre and narrative are created and sustained through design choices and the interplay of images, sounds and action.

For the creative component of the course, the students put their critical understanding into practice, using a piece of software called MissionMaker to make their own mini-games incorporating lessons learnt about genre, narrative, character, audience and marketing. It is through creativity that the students' knowledge about games and gaming is reinforced and demonstrated.

The game-making course enhances students' 'literacy' in games media, enabling them to analyse this particular technological and cultural form, and to participate in media creation[7].

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7   See Burn, A and Durran, J (2007). Media Literacy in Schools: Practice, production and progression. Paul Chapman Educational Publishing

3. Digital literacy and school subjects

This section outlines a model of digital literacy that is beginning to influence educational policy and practice, and it seeks to introduce readers to some of the major aspects of teaching and learning related to the development of young people's digital literacy in school subjects. After introducing this model, the rest of the report then explores in more detail the research and evidence that has contributed to the recent attention on digital literacy and participation in educational debates.

Teachers and schools are increasingly being asked to combine the development of students' subject knowledge with the ability to use technology safely and effectively[8]. Focussing on notions of digital literacy and digital participation can be one way to start to achieve this integration.

Indeed, there is now some evidence emerging of classroom practices promoting the development of digital literacy in the classroom, some examples of which are included in text boxes throughout this document[9]. Much of this information derives from specific small-scale projects rather than constituting full programmes of research, and many have been developed in informal

environments outside of the formal educational system[10]. To date, however, there is little research providing in-depth evidence about how to effectively integrate digital literacy and digital participation in everyday school settings.

Despite the lack of evidence, several attempts have been made to provide models which set out practical ways to think about digital literacy in schools[11]. Some of these models concentrate on the process which learners need to go through in order to demonstrate digital literacy. Others explore the way in which digital literacy develops over time. Both of these sorts of models may constitute usable frameworks in order to help teachers and practitioners incorporate digital literacy into current teaching practice.

The model represented by the diagram in Figure 1 was developed on the basis of an extensive review of the research literature on digital literacy, and constitutes an amalgamation of some of the most influential recent research in this area[12]. As such, the model does not represent a definitive answer to the question of what digital literacy might be, or provide a template for

[8] See, for example, Becta (2009). Enabling Next Generation Learning: Enhancing learning through technology. A Guide for those who work with schools which sets out 6 recommendations for schools: 1) **Improve your school:** develop and follow a strategy that uses technology to achieve better outcomes for learners; 2) **Achieve best value:** secure quality, fit-for-purpose technology, with the right support, at the right price; 3) **Safeguard learners online:** protect, educate and empower everyone to keep safe and secure online; 4) **Plan sustainable success:** balance the economic, social and environmental aspects of technology for learning; 5) **Inspire parental engagement:** enable parents to access and use technology for a positive impact on their children's learning; and 6) **Make learning personal:** support learners to make effective, discriminating use of technology that meets their needs.

[9] There are many websites aiming to support teachers who are developing new approaches to teaching and learning with digital technologies that may also be helpful, for example nextgen.ning.com and www.classroom20.com.

[10] There is influential research reporting on the alleged benefits to young people of using digital technologies and media outside of the formal school environment. Much of this research is based on anecdotal or small-scale evidence and usually takes an overtly critical view of formal education. For example, see Collins, A and Halverson, R (2009). Rethinking Education in the Age of Technology: The digital revolution and schooling in America. Teachers College Press; Gee, JP (2004). Situated Language and Learning: A critique of traditional schooling. Routledge; and an early example of this kind of research: Tapscott, D (1998). Growing Up Digital: The rise of the net generation. McGraw-Hill).

[11] Attempts to foster digital literacy in school subjects have a long history. The Microelectronics Education Programme (MEP) developed a strategy dating from 1981 which aimed "to prepare children for life in a society in which devices and systems based on microelectronics are commonplace and pervasive" and had "the dual aim of enriching the study of individual subjects and of familiarising pupils with the use of the microcomputer itself". Fothergill, R and Anderson, SA (1981). Strategy for the Microelectronics Education Programme (MEP), Innovations in Education and Teaching International, 18,3: 120 – 129.

[12] Newman, T (2008) A Review of Digital Literacy in 3-16 Year Olds: Evidence, developmental models, and recommendations (Timmus Ltd) and Newman, T (2009) Consequences of a Digital Literacy Review: Moving from terminology to action. www.slideshare.net/TabethaNewman/digital-literacy-literature-review-from-terminology-to-action

the development of classroom practices. It offers a conceptual framework for embedding digital literacy as an aim in the curriculum and for developing strategies to develop it through classroom activities.
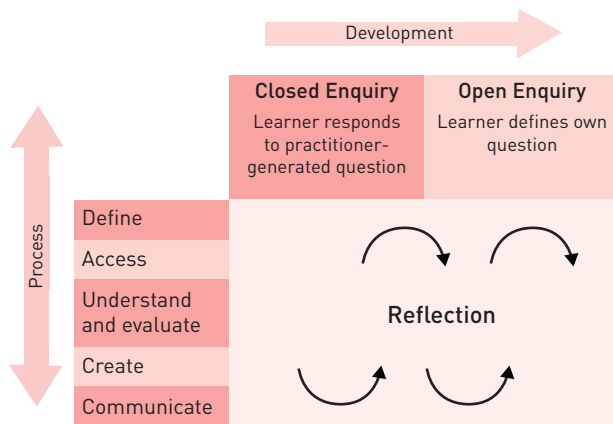

Fig 1: A model of digital literacy for schools

This model provides information about what sort of processes students need to go through in order to demonstrate digital literacy. The model is also based on the notion that learners investigate questions and problems set by teachers, and that over time they should develop sufficient confidence and competence in the skills, knowledge and understanding of digital literacy to be able to define their own questions for enquiry. It therefore offers a potentially useful structure for classroom activities which seek to foster digital literacy. The author suggests that digital literacy is an amalgamation of:

_ **Knowledge of digital tools:** hardware/software awareness and competence

_ **Critical skills:** evaluation and contextualisation

_ **Social awareness:** understanding your identity, collaborating, and communicating to audiences in context

This model suggests that students develop and demonstrate digital literacy by being involved in defining an appropriate task or question and accessing information, knowledge and expertise which will help them complete this task or answer the question.

They need to understand and analyse this information, re-contextualise it, synthesise it and relate it to other knowledge in order to create an answer to the question and communicate the results.

In using technology and media to create and communicate, students will have to make decisions about what content and format is appropriate for particular audiences and tasks in specific cultural contexts. They will also need to think about how their use of technology and media will shape the sort of message they are able to communicate. This may help students to be aware of how the digital media they encounter in their everyday lives and learning is also created by people and corporations with particular agendas and how these factors affect the kind of knowledge and information that is produced and communicated using digital technologies.

The process which the model suggests is not necessarily always linear and may involve moving up and down the stages as students refine their task and their thinking. At all stages of the process, however, students critically reflect upon what they have been doing and what sort of digital or non-digital tools are appropriate to the task.

This model therefore offers a combined development of subject knowledge, critical thinking about subject knowledge, critical thinking about digital media and functional ICT skills. A successful combination of these areas is key to putting digital literacy into practice in school subjects in order to contribute to the development of young people's informed digital participation.

> **Essential ICT skills for learning and life**
>
> The processes involved in digital literacy can also be mapped onto Becta's view of the essential ICT skills for learning and life, which are the abilities to use technology to:
>
> **Find and select:** Knowing what information is available and being able to retrieve it.
>
> **Organise and process:** Using and processing information in a wide range of ways to meet identified

needs. This may involve for example classification, integration, calculation, summarising and storage.

Create: Making new products, for example by adapting, applying, designing, inventing or authoring.

Communicate and collaborate: Presenting, sharing and transferring products and information in suitable forms to produce results such as informing, persuading or engaging others.

Review and improve: Making judgements about the authenticity, honesty, relevance, selfulness, or accuracy of information, plus ethical and value judgements. Exploring options, refining and improving outcomes.

All of these skills will develop in combination and lead to:

Understanding: Using modelling, visualisation and real-life experiences to develop deeper knowledge and appreciation of subject concepts and complex ideas[13].

The remainder of this document discusses the concepts and educational debates that have underpinned recent attempts to define digital literacy. It provides a critical introduction to the research and the evidence that has led to current attempts to introduce digital literacy strategies directly into schools, pointing out the implications of this research for practice and identifying a range of emerging examples of classroom practices which exhibit aspects of digital literacy development.

[13]   See Becta (2009). Contribution to the Rose Review. Becta.

4. Contexts for digital literacy and participation

This section considers the factors that are driving a growing interest in digital literacy amongst educational practitioners, researchers and policymakers. First, it shows how an emerging body of academic research on children's uses of new technology in their own social and leisure time is contributing to calls for schools to change their approach. Second, it identifies how education policy has shifted to focus on the role of digital technologies in the improvement of education and skills.

These drivers are important to recognise because they show how the interest in digital literacy is motivated by different interpretations of the role of technology and media in society. To take an extreme example, some critics claim that technology and media make it more likely for children to become voracious consumers, and think schools need to provide digital literacy skills to combat this. Others, however, argue that having the digital literacy to make effective use of technology and media will equip young people to become competitive and successful workers in an increasingly computerised, high-tech economy.

The view we adopt is that developing young people's digital literacy in schools is an important step in enabling them to become informed, self-aware and safe participants in digital media culture. The motivation for developing their digital literacy is the same as the motivation for developing their literacy: to ensure they are able to access the resources of the culture, to make social associations and affiliations, be creative and critical, and to ensure their own economic potential in the future. So what factors are driving this current interest in digital literacy and participation, and what are the implications for schools?

Digital cultures

It has become commonplace to claim that children are now engaging more than ever before with technology and digital media in their daily lives outside of the classroom. Data collected in many western countries now demonstrates the extent to which technology and media are used and consumed by young people, and to what effects. These studies have produced detailed and

credible statistics and qualitative data showing rises, falls and fluctuations in technology and media usage across sections of the population, as well as analyses of the benefits and risks associated with them[14].

Such studies show that in their own social and leisure time, many young people are now spending significant amounts of their time using digital media such as video games, social networking sites, video sharing, music editing, animation and different forms of online communication, as well as carrying out a host of more prosaic activities. Many of these activities and the tools and services which make them possible have potential for application in formal educational environments.

While much of the available research finds that many children feel confident about their use of digital media and technology, this confidence does not necessarily always translate directly into competence in using technology. For example, young people may not be asking questions about how information is produced for digital environments or about the powerful commercial strategies that operate within the media[15].

In addition, digital media is intimately tied to questions about knowledge and popular culture. When young people engage with digital media they are engaging with popular culture experiences through which they are acquiring, interpreting and even creating knowledge. Much of this

[14] A major US project is currently seeking to provide empirical evidence of young people's uses of new media and technology that may have transatlantic symmetries with practices in the UK context. For details see Ito, M, Horst, H, Bittanti, M, Boyd, D, Herr-Stephenson, R, Lange, P, Pascoe, C, Robinson, L (2008). Living and Learning with New Media: Summary of findings from the digital youth project. MacArthur Foundation. In Europe, the EU Kids online network takes a comparative cross-national approach to studying the growing use of the internet and online technologies. It aims to understand "what these changes mean for children and their families, for their education, leisure, participation and community and, more negatively, for the risk of harm to children and young people". Hasebrink, U, Livingstone, S, Haddon, L (2008). Comparing Children's Online Opportunities and Risks Across Europe: Cross-national comparisons for EU Kids Online. EU Kids Online Deliverable D3.2. See also Livingstone, S and Haddon, L (2009). EU Kids Online: Final report. LSE, London: EU Kids Online. (EC Safer Internet Plus Programme Deliverable D6.5); and Ofcom (2008) Media Literacy Audit: Report on UK children's media literacy.

[15] See Livingstone, S and Bober, M (2004). UK Children go Online: Listening to young people's experiences. LSE.

knowledge accretes to form particularly strong sorts of narratives with which young people - and, in fact, adults - make sense of the world they encounter. Many of these popular culture 'texts' and 'programmes' will provide great pleasures and frustrations, while others will have been intended to be persuasive and manipulative, such as political spin or viral advertising. Popular culture is also often at odds with the intellectual climate of the school curriculum, where established canons of knowledge are arranged to be passed on to young learners; popular culture rarely gets much syllabus space[16].

Young people's engagement with digital media and popular culture is therefore a process of exchange between those who make texts and those who read them, or those who design websites and those who navigate them, those who develop videogames and those who play them. The relationship between producers and audiences implied by this characterisation therefore emphasises,

on the one hand, the political economy of the media and its regimes of industrial production and policy-governed regulation; and on the other, the social contexts of audiences, caught between interpretation and consumption, between receiving media texts made for them and producing their own meanings[17].

Engaging in questions about digital media in young people's lives and their learning thus means engaging in questions about who produces digital media, and how audiences—in this case young people—receive and interpret it, or use it to create their own products and meanings. These concerns, as well as the positive potential of digital media for learning, give rise to the need for emphasising digital literacy in formal education. The skills of digital literacy are seen as essential prerequisites for young people to participate in an informed way in the digital environment.

At the same time, other analyses are extremely positive about the potential of digital media to change the ways in which young people learn, and some even suggest there is evidence that young people are already demonstrating a range of heightened competences and skills from using it[18]. For example, playing video games is supposed to inculcate players with the kinds of skills they will need to thrive in modern capitalist businesses[19]. A high school has been established in New York which seeks to demonstrate how 'game-based learning' can become the core for a whole school curriculum[20].

As a consequence, it has been accepted by many organisations with an interest in education that young people are growing up better equipped than older generations with the experiences and skills necessary to life and learning in the 21st century. For example, the US-based Partnership for 21st Century Skills (which is supported by many major multinational new technology and media organisations) lists a series of 'Learning and Innovation Skills' that are common in the corporate educational literature (see boxed text for details)[21]. The sorts of skills detailed in these texts assume that schools are having to change to keep up with developments in the high-tech industries. The challenge is that school resources cannot compete with the slick and professional standards of digital media, and that the curriculum and pedagogies are unappealing and disengaging in comparison[22].

16 For detailed analysis of the role of popular culture formats in children's lives and learning see Fiske, J (1989). Reading the Popular. Unwin Hyman; Marsh, J and Millard, E (2000). Literacy and Popular Culture: Using children's culture in the classroom. Paul Chapman Publishing; Buckingham, D (2003). Media Education: Literacy, learning and contemporary culture. Polity; and Snyder, I and Beavis, C (eds) (2004). Doing Literacy Online: Teaching, learning and playing in an electronic world. Hampton Press.
17 Burn, A (2009). Making New Media: Creative production and digital literacies. Paul Chapman Publishing.

18 For example, see Barham, N (2004). Disconnected: Why your kids are turning their backs on everything we thought we knew. Ebury Press; Veen, W and Vrakking, B (2006). Homo Zappiens: Growing up in the digital age. Network Continuum Education.
19 Beck, JC and Wade, M (2003). Got Game: How the gamer generation is reshaping business forever. Harvard Business Press; and Gee, JP (2003). What Videogames have to Teach Us About Learning and Literacy. Palgrave MacMillan.
20 Its website states that "Design and innovation are at the heart of Quest to Learn (Q2L), a school committed to helping every student to achieve excellence in the skills and literacies necessary for college and career readiness. We believe that students today can and do learn in different ways, often through interaction with digital media and games". See www.q2l.org.
21 Partnership for 21st Century Skills website: www.21stcenturyskills.org. A flyer detailing members of the partnership (including major new technology and media providers) is available at: www.21stcenturyskills.org/documents/framework_flyer_updated_april_2009.pdf.
22 See Kenway, J and Bullen, E (2001). Consuming Children: Entertainment-education-advertising. Open University Press.

Such assumptions about young people's digital media competences have led some commentators to claim that today's young people can be described as 'digital natives'[23]. Marc Prensky, for example, claims that the young people in school today are the first generation to grow up with digital technologies. He believes that these young people think and process information in a fundamentally different way; they are 'native speakers of the digital language of computers, video games and the Internet'[24]. Prensky contrasts this with an older generation of 'digital immigrants' who need to work harder to understand a world mediated by digital technologies.

Whilst some children do make extensive recreational use of digital media, there are reasons to be suspicious of the claim that young people today represent a 'native' digital generation. There are many academic studies which refute the digital native idea as not being evidence based[25]. Not only are there many adults who use technology extensively, there is also vast inequalities in access to and use of technology amongst supposed 'digital natives'[26]. Importantly, it is also the case that children often do not have as much knowledge about technology (or as much 'digital literacy') as is implied by the term 'digital native'. The problem with the 'digital natives' idea, then, is that it often overestimates the amount of knowledge that young people have about digital technologies and digital cultures. It risks

simply celebrating children's sometimes uninformed recreational use of technology and using it as a rationale for the use of technology in the classroom[27].

Skills framework of the Partnership for 21st Century Skills

The Partnership for 21st Century Skills involves many technology and media corporations, and provides a taxonomy of the new kinds of skills that it is alleged will be required for learning and work in the 21st century.

Learning and innovation skills: Learning and innovation skills are what separate students who are prepared for increasingly complex life and work environments in the 21st century and those who are not. They include:

_ creativity and innovation

_ critical thinking and problem solving

_ communication and collaboration

Information, media and technology skills: To be effective in the 21st century, citizens and workers must be able to exhibit a range of functional and critical thinking skills, such as:

_ information literacy

_ media literacy

_ ICT (Information, Communications and Technology) literacy

Life and career skills: Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous

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[23] Others make similar arguments using different terminology, such as 'cyberkids', 'digital generation', 'Nintendo generation', 'net generation', 'boom-echo', 'Google generation', and so on.

[24] Prensky, M (2001). Digital Natives, Digital Immigrants. On the Horizon, 9,5: 1; Prensky, M (2001). Digital Game-Based Learning. McGraw-Hill.

[25] For critiques see Facer, K and Furlong, R (2001). Beyond the Myth of the 'Cyberkid': Young people at the margins of the information revolution. Journal of Youth Studies, 4,4: 451-469; Buckingham, D and Willett, R (eds) (2006). Digital Generations: Children, young people and new media. Lawrence Erlbaum Associates; Bennett, S, Maton, K, Kervin, L (2008). The 'Digital Natives' Debate: A critical review of the evidence. British Journal of Educational Technology, 39,5: 775-786.

[26] There is extensive research which highlights vast inequalities in people's access to and use of digital technologies. See, for example, Digital Inclusion Team (2007). The Digital Inclusion Landscape in England: Delivering social impact through information and communications technology. digitalinclusion.pbworks.com/f/The+Digital+Inclusion+Landscape +In+England.pdf.

[27] Buckingham, D (2007). Beyond Technology: Children's learning in the age of digital culture. Polity.

attention to developing adequate life and career skills, such as:

_ flexibility and adaptability

_ initiative and self-direction

_ social and cross-cultural skills

_ productivity and accountability

_ leadership and responsibility

Additionally, the 'digital natives' argument neglects to consider how commercialisation and market-based forces are operating in ever more complex ways upon children. The kinds of new media celebrated in the accounts of digital natives' informal learning are, of course, products of the commercial landscape, usually designed for purposes other than education. As such, the ways in which young people engage with them cannot be viewed as straightforward and unproblematic. There are implications for the ways in which young people as technology users gain access to knowledge, communicate with other people, interpret advertisements and marketing campaigns and make sense of their own identities. Much work in this area assumes that young people are becoming increasingly sophisticated users of digital media, but that commercial providers continue to exert powerful effects on them, shaping their actions, desires, relationships and consumer preferences[28].

In short, what these debates demonstrate is that young people are being 'constructed' in a variety of different ways, according to different analyses of their

engagement with new technology[29]. Commercial providers construct young people as expert technology users with sophisticated tastes and consumer preferences. Optimistic commentators construct children as expert learners who are already demonstrating through digital media the kinds of activities and practices that schools need to adopt, largely in order to ensure their preparation for a digital economy. There is a need, then, for schools to contribute to the process of equipping children with the skills, capability and disposition to participate in informed and critical use of technology both inside and outside of school.

Teaching digital literacy and digital participation is one way of ensuring that **all** young people, not just the more privileged, can use technology meaningfully and be fully included in digital cultures. It is an important component of tackling the 'digital divide'. The term the 'digital divide' is a way of describing the large differences that exist between people who are able to access and use ICT effectively and those who cannot. Not only do these differences often run along socio-economic lines, they can also serve to reinforce them. The poorest in society may have less access to computers, the internet and meaningful ICT education, and not being able to use a computer effectively is likely to prevent them from getting many jobs, as well as from participating in a wide variety of government and other services which are often offered online[30]. This has also been described as the "participation gap": "the fundamental inequalities in young people's access to new media technologies and the opportunities for participation they represent"[31].

[28] See, for example, Cook, DT (2004). The Commercialisation of Childhood. Duke University Press; Buckingham, D (2007). Selling Childhood? Children and consumer culture. Journal of Children and Media, 1,1, 15-24; Barber, B (2008). Consumed: How markets corrupt children, infantilize adults, and swallow citizens whole. WW Norton.

[29] Useful accounts of childhood as a constructed category can be found in Prout, A and James, A (1997). A new paradigm for the sociology of childhood, in: James, A and Prout, A (eds) Constructing and Reconstructing Childhood. Routledge; and James, A, Jenks, C and Prout, A (1998). Theorizing Childhood Polity Press.

[30] See Warschauer, M (2004). Technology and Social Inclusion: Rethinking the digital divide. MIT Press; Selwyn, N and Facer, K (2007). Beyond the Digital Divide: Rethinking digital inclusion for the 21st Century. Futurelab; Communities and Local Government (2008). Delivering Digital Inclusion: An Action Plan for Consultation. CLG; and Walker, L (2009). Using Digital Technologies to Promote Inclusive Practices in Education. Futurelab.

[31] Jenkins, H (2007). Confronting the Challenges of Participatory Culture: Media education for the 21st century. The MacArthur Foundation.
www.newmedialiteracies.org/files/working/NMLWhitePaper.pdf.

Tackling digital inclusion, and ensuring the equitable digital participation opportunities of all young people, requires not just access to technology but also the digital literacy skills and knowledge which allows people to create and communicate using this technology:

> optimal use of ICT in education is... not simply a matter of giving children encouragement in their studies while they gain a technical facility with the so-called tools of the future, but more significantly about facilitating a transformation in the nature of knowledge and the learning process[32].

According to the available research on young people's uses of new technologies and media, technology should be used in schools not just to advance subject knowledge but also to empower young people to become effective and safe participants in a world that's increasingly going digital. Using technologies for teaching and learning may be one way to engage young people and arouse and stimulate their interest in particular subject areas. It can offer possibilities for students to take an active part in their learning, to communicate it creatively, to learn to collaborate with others and to link their learning with their existing concerns and interests.

It should be recognised, however, that the competencies that children need in order to accomplish all of this extend well beyond the functional skills of being able to use technology effectively. There is a concern that technology can be used in schools in a purely instrumental way without consideration of the complex ways in which technology and media represent the world or the power vested in them. It is important then that technology is not used for teaching solely for the sake of using technology but only when it is helpful in advancing meaningful learning.

It is also important that young people learn **about** technologies rather than just being taught **with** or **through** them[33]. Students need to be equipped with the critical thinking skills that will enable them to ask discerning questions about the information and

PRACTICE BOX: Becta's digital literacy resource

Becta commissioned North West Learning Grid to develop a resource to encourage Key Stage 3 students to focus on the knowledge and skills related to accessing, understanding and evaluating digital information. Learners are "encouraged to question their knowledge, understanding and behaviours through the use of magazine style quizzes providing them with feedback on their internet 'personality'. Learners then select areas for further investigation. Each area provides them with information that challenges their assumptions and then allows the learner to test and practice their understanding through a game. The resource is not intended to be a complete Digital Literacy course but serves as an introduction to encourage the learner to reflect on and question their current practices". See www.nwlg.org/digitalliteracy

knowledge they are receiving and creating using digital technologies both inside and outside of the classroom. Digital literacy means getting to a point where learners can be self–reliant, informed and discerning users able to select and appropriately use the best technology for the task at hand.

Educational policy, ICT and the changing curriculum landscape

Policy developments increasingly emphasise the need to integrate ICT across the curriculum. The Harnessing Technology 2 Strategy emphasises the use of technology to support learning and education across the entire school system[34] and there is increasing interest, for example, in using 'Web 2.0' participatory technologies such as wikis, video sharing sites, blogs, mobile devices, games and audio-visual technology to enhance the

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32 Livingstone, S (2002). Young People and New Media. Sage.
33 Burn, A and Durran, J (2007). Media Literacy in Schools: Practice, production and progression. Paul Chapman Publishing.

34 Becta (2008). Harnessing Technology: Next generation learning 2008:14-19. Becta.

curriculum in both primary and secondary schools[35]. Indeed, there are increasing calls for schools and the curriculum to be modernised in order to match up to the sophistication of the tools and resources available via digital media.

While caution has to be urged when it comes to reports about young people's competence with digital media outside of the formal environment of the school, it is clear that these technologies are challenging what it means to learn, live and work these days. The changes brought about by technology and media may not be as widespread or significant as some commentators have suggested[36]. However, in order to ensure that young people are able to make positive and informed sense of the potential of digital media as its role develops further, it will become more and more necessary to treat it seriously within the formats and formalities of school. It is useful, then, to think of the potential significance of digital media for learning by avoiding both "the extremes of cyber-optimism and Luddite denial" and adopting a form of "critical utopianism" that is simultaneously sceptical and optimistic[37].

In this section, a number of recent educational policy shifts are described in order to demonstrate how digital literacy and digital participation are being positioned as requirements for schools to address.

Reform of the Secondary Curriculum

The National Curriculum for secondary schools in

England was reformed in 2008 to give schools more local responsibility and flexibility. With an enhanced focus on the objective of supporting young people to be successful learners, confident individuals and responsible citizens, it placed less emphasis than before on the acquisition of a body of curricular content. Instead, subjects were reconceived as spaces for young people to practice and develop their personal, learning and thinking skills. The new Curriculum for Excellence in Scotland is based on similar aims and objectives.

The rationale for these changes is that in order to be successful in the future young people need the skills, competences and processes to manage their own learning and lifelong development in a changing world, and that they need this more than they need a head full of facts. Significantly, the use of ICT across the entire curriculum has taken on heightened importance since it is the skills associated with confident ICT use that will secure young people the best jobs in the future and ensure that they are able to make best use of technology to enhance their own learning.

The Independent Review of the Primary Curriculum

The primary curriculum reforms proposed by Sir Jim Rose's 2009 review also seek to reduce prescription and content in order to allow primary schools greater autonomy and flexibility in shaping a curriculum that meets local needs. The review accepts the 2008 secondary curriculum aims (successful learners, confident individuals and responsible citizens) and it argues that meeting those aims depends on the 'Essentials for Learning and Life' of literacy, numeracy and ICT.

The review therefore puts literacy, numeracy and ICT at the core of the primary curriculum and they are prioritised throughout its six areas of learning. This increased significance of ICT in the primary curriculum is a recognition of the increasing digitisation of the world in which young people are growing up and which "will require digital literacy of all children for their full participation in society". The report therefore calls for

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[35] There is growing research on the application of Web 2.0 for learning, though to date no conclusive evidence that it is being used to educational benefit or advantage. See, for example, Selwyn, N (ed) (2008). Education 2.0: Designing the web for teaching and learning, TLRP-TEL; Crook, C and Harrison, C (2008). Web 2.0 Technologies for Learning at Key Stages 3 and 4: Summary report. Becta; and Merchant, G and Davies, J (2009). Web 2.0 for Schools: Learning and social participation. Peter Lang Publishing.

[36] Some of the more optimistic and technologically deterministic claims are made in Leadbeater, C (2000). Living on Thin Air: The new economy. Penguin; Surowiecki, J (2005). The Wisdom of Crowds: Why the many are smarter than the few. Abacus; and Tapscott, D and Williams, A (2008). Wikinomics: How mass collaboration changes everything. Atlantic Books.

[37] Burn, A (2009). Making New Media: Creative production and digital literacies. Paul Chapman Publishing.

the skills of safe and critical technology use, as well as functional skills, to be fostered across the curriculum[38].

E-safety

These skill-based arguments and curriculum developments are accompanied by a growing policy concern with e-safety[39]. Anxiety about the potential of the internet to pose threats to child safety revolves around concerns that web-based technologies may expose vulnerable children to predatory adult sexual behaviour, to cyber-bullying and to pornographic, violent or other forms of inappropriate content. These concerns prompted the government to commission the Byron Review which reported in 2008, leading to the establishment of the UK Council for Child Internet Safety (UKCCIS).

The Byron Review emphasised the importance of preserving the right of young people to take risks, arguing that this is an inherent part of their development[40]. It therefore moved away from a focus on the need to 'protect' children and focussed instead on the importance of education[41]. Indeed, the action plan arising from the review argued that "Schools and other services for children and families have a key role in helping equip and empower children and their parents to stay safe online." Children can only stay safe online if they are furnished with the ability to make appropriate and informed decisions about their use of digital technologies. This involves ensuring that learners understand the '3 Cs' of appropriate content, contacts and conduct[42]. The notion of e-safety is an important part of what it means to be digitally literate, and an important policy area which drives the current focus on how to be an effective digital participant.

Digital Britain

The Digital Britain report published in 2009 by the departments for Culture, Media and Sport (DCMS) and Business, Innovation and Skills (BIS) provides an "analysis of the levels of digital participation, skills and access needed for the digital future, with a plan for increasing participation, and more coherent public structures to deal with it". It suggests that digital participation can be heightened by addressing:

Affordability: both in relation to equipment and ongoing costs

Capability and relevance: ensuring that all citizens have the skills, motivation and confidence they need

Availability: by making sure of a wide availability of key services.

Digital Britain sets out an action plan to secure the UK's position as one of the world's leading digital knowledge economies. It argues that we need to develop the nation's digital skills at all levels in order to achieve a supply of high quality professionals and ensure Britain's future prosperity. As part of this, the report sets out a 'National Plan for Digital Participation' and a programme of work to ensure that all citizens have the skills, motivation and confidence they need to become 'digital participants'[43].

The report defines digital participation as "increasing the reach, breadth and depth of digital technology use across all sections of society, to maximise digital participation and the economic and social benefits it can bring"[44]. As a result of the Digital Britain report, the government has

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[38] Rose, J (2009). Independent Review of the Primary Curriculum: Final report. DCSF. www.dcsf.gov.uk/primarycurriculumreview

[39] This concern with e-safety also relates to the government's current focus on well-being as reflected in the Children's Plan and Every Child Matters.

[40] Byron Review (2008). The Byron Review: Safer children in a digital world. DCSF.

[41] There is also useful guidance from Becta (2006). Developing Whole-School Policies to Support Effective Practice in E-Safety. Becta.

[42] See Becta (2009). Enabling Next Generation Learning: Enhancing learning through technology – a guide for those who work in schools. Becta.

[43] This policy focus on digital participation is part of the government's skills agenda; it derives from an economic argument about the need to extend the UK's resources of human capital. The Leitch review is often seen to be a landmark document in defining and advancing the skills agenda. It was published in 2006 and analysed the UK's long-term skills needs, recommending that the UK become a world leader in skills by 2020 in the interest of maximising economic growth and prosperity. Leitch, S (2006). Leitch Review of Skills: Prosperity for all in the global economy - world class skills. HM Treasury.

[44] Department for Culture, Media and Sport (DCMS) and Department for Business, Innovation and Skills (BIS) (2009). Digital Britain: Final report. The Stationery Office.

asked Ofcom to formalise a Consortium of Stakeholders to drive the National Plan for Digital Participation[45].

Morris Independent Review of ICT User Skills

In June 2009 Baroness Estelle Morris published her independent review of ICT user skills. The report adopts the term 'digital life skills' to identify the set of basic ICT skills for using a computer to safely enter, access and communicate information. It argues that digital skills have an impact on an adult's equality of access to information and services, employability, social inclusion, engagement in further learning, and on wider business productivity. The review therefore proposes an 'Entitlement to digital life skills' for all adults. Teaching digital literacy and digital participation in the classroom is one way to ensure that the adults of tomorrow possess digital life skills[46].

Implications for developing digital participation in schools

The key issue running through all of these policy and cultural drivers, then, is the suggestion that only young people who are able to develop their digital literacy will be able to participate fully in social, cultural, economic and civic life now and in the future. Digital literacy and participation thus become important for the sustainability of the UK's competitiveness in a global economy dominated by high-tech services and the exchange of knowledge and information rather than manufacturing and physical goods.

In addition, the concern to promote digital participation is related to people's employment prospects, access to public services and learning, and their online safety. From a specifically educational perspective, policy is concerned to ensure that all learners have access to technology for learning, and there is a growing emphasis on their critical and analytical digital literacy skills as well as their functional skills and their protection from harmful content.

At the current time, it is clear that there remain significant disparities and inequalities in the extent to which young people are able to access and use digital media as a set of tools and resources for participating in learning and civic life, whether informally at home or formally through planned activities within schools. A persistent digital divide continues to prevent some young people from developing the skills, knowledge and understanding that they need currently to maximise their learning and personal development opportunities, and that they will need throughout their lives to ensure their social, cultural, civic and economic participation is also maximised.

If a curriculum is organised as a way of ensuring that young people have opportunities throughout their lives, then a curriculum focused on developing young people's digital participation - and on ramifying the intimate connections between subject knowledge, skills and everyday life - will better meet their needs as lifelong learners and citizens in a digital media age.

The major implication of this is clearly the need to establish curricular and classroom strategies to ensure that all young people are provided with the skills, knowledge and understanding to which they are entitled as maturing participants in social, cultural, civic and economic activity. Enhancing young people's opportunities for digital participation should be seen as an objective to be met through all of the school subjects. In the following section we outline the various 'components' and debates involved in shaping a vision of digital participation that may be integrated across the curriculum.

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[45] Ofcom is the independent organisation which regulates the UK's broadcasting, telecommunications and wireless communications sectors. Since 2003, Ofcom has had responsibility for promoting media literacy in the UK.

[46] Department for Business, Innovation and Skills [BIS] (2009). Morris Independent Review of ICT User Skills. DCMS and BIS. www.dius.gov.uk/~/media/publications/I/ict_user_skills

5. Developing the educational vision for digital participation

Having established that the current focus on digital literacy arises from a perceived need to ensure that students are able to participate in digital and media cultures, this document now turns to a discussion of how digital participation can be fostered as an educational aim or ambition. This section reviews a body of recent research literature which has sought to engage with the question of how young people can be prepared for learning, life and working in the context of technological developments and the social adaptations to which these developments are contributing.

So what makes for an effective and safe digital participant? The research literature identifies some of the elements of what it means for young people to be effective in the way they engage with and use digital technologies and media. It suggests that young people need a 'portfolio' or 'repertoire' of integrated skills, knowledge and understanding in order to become discerning participants in 21st century digital cultures.

Below we work through several components of this 'repertoire' taken from the literature on literacy, media literacy, information literacy and digital literacy among other areas[47]. Whilst school subjects cannot always be expected to provide young people with all of the elements of this repertoire, some consideration of the following areas may be useful for shaping and informing specific classroom practices around the promotion of digital literacy and digital participation. The view we adopt, again, is that social, cultural, civic and economic participation of any kind requires literacy first and foremost; digital literacy is thus an extension of the literacy to which everyone is entitled.

Bloom's Digital Taxonomy

Some teachers may find it helpful to relate digital literacy to Bloom's taxonomy where it is suggested that students move towards higher thinking skills through a series of being able to remember, understand, apply, analyse, evaluate and create[48].

In 2008 a digital taxonomy based on Bloom's work was produced which supplied a number of verbs related to technology and media under each of Bloom's headings. This taxonomy suggested that 'creating' in a digital context, for example, might involve designing, constructing, planning, producing, inventing, devising, making, programming, filming, animating, blogging, video blogging, mixing, re-mixing, wiki-ing, publishing, videocasting, podcasting, directing or broadcasting.

The digital taxonomy also included attention to digital 'collaboration' which it suggested might involve moderating, negotiating, debating, commenting, video conferencing, reviewing, questioning, commenting, posting, networking, contributing, chatting, e-mailing, twittering, texting and instant messaging.

This digital taxonomy attempts to point to some of the possibilities that technology might present for learning and for helping students themselves to think critically about both subject knowledge and digital technologies. It is important for both students and teachers to remember, however, that for some tasks it may also be more appropriate for students to read, write, create, communicate and collaborate using non-digital formats and tools[49].

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[47] There is much debate about the terms associated with digital literacy and digital participation. Multiple approaches to the subject engender differences of opinion about what each term refers to and which should be preferred, as well as about whether it is more helpful to define digital literacy as a concept or to provide a model of what it means to be digitally literate. A useful web debate on definitions can be found here: digilit.wetpaint.com/thread/2571079/Definitions.

[48] See Bloom, B (ed) (1956). Taxonomy of Educational Objectives: The classification of educational goals – Handbook I: Cognitive Domain. McKay. and Anderson, LW, and Krathwohl, DR (eds) (2001). A Taxonomy for Learning, Teaching, and Assessing: A revision of Bloom's taxonomy of educational objectives. Longman.

[49] Churches, A (2008). Bloom's Digital Taxonomy. edorigami.wikispaces.com/Bloom%27s+Digital+Taxonomy.

Literacy

The term 'literacy' is often used to refer to the functional skills of being able to read and write as related specifically to written texts. Some researchers, however, suggest that literacy should be understood in broader terms. Bazalgette, for example, argues that "literacy ought to be the whole portfolio of integrated skills, knowledge and understanding that enables us to participate in our culture and society". She dislikes terms such as digital literacy and media literacy, believing that they should not be regarded as unique or separate sets of competences but instead as an essential part of literacy itself. Rather than inventing new terms, the term 'literacy' should be redefined for the 21st century[50].

Literacy implies the ability to produce and receive meaning and should be understood in relation to specific social, cultural and historical contexts and practices. This argument views literacy as the outcome of a combined understanding of:

_ the operational (or language)

_ the cultural (or meaning)

_ the critical (or context)

Others add 'creative' and 'collaborative' dimensions to this model, arguing that literacy also involves the active creation and communication of knowledge[51].

According to such writers, then, literacy is about far more than the functional skills of reading and writing; it involves decisions about what might be appropriate in particular contexts and why, it involves understanding and generating meaningful content and it requires the recognition that meaning is socially constructed and an ability to negotiate the implications of differing constructions of meaning. Literacy is a set of social, cultural and political practices in which people produce, communicate and receive meaning, and in which they reflect upon and challenge their own assumptions, as well as the assumptions of others[52]. This understanding of literacy as a combination of the operational, cultural, critical, creative and collaborative forms an important component of what it means to be an effective digital participant.

Five dimensions of literacy

Operational involves the ability to use a system of language and to read and write in an appropriate and adequate manner in a range of different contexts.

Cultural refers to the ability to understand texts in relation to particular cultural meaning systems and contexts.

Critical involves awareness that all knowledge and all social practices are socially constructed and 'selective.' Knowledge and meaning are developed by communities of people in relation to specific historical, economic and political circumstances. They will include some representations, values, purposes, standards, interests and perspectives and exclude others.

Creative refers to the ability to produce meaningful and engaging content in appropriate formats and for particular audiences.

Collaborative means to communicate, interact and work with others to create shared understandings and meanings.

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[51] Lankshear, C and Knobel, M (2003). New Literacies: Changing knowledge and classroom learning. Open University Press. Burn and Durran also claim that "Literacy is cultural, Literacy is critical, Literacy is transformative and creative". Burn, A and Durran, J (2007). Media Literacy: Practice and progression. Paul Chapman Publishing.

[52] This view of literacy draws on the work of New Literacy Studies (NLC) which "represents a new tradition in considering the nature of literacy, focusing not so much on acquisition of skills, as in dominant approaches, but rather on what it means to think of literacy as a social practice". Street, B (2003). What's 'new' in New Literacy Studies? Critical approaches to literacy in theory and practice, Current Issues in Comparative Education, 5,2: 77

[50] Bazalgette, C (2008). Literacy in Time and Space. PoV, 1,1: 12-16.

Information literacy and media literacy

During the 1990s there was increasing concern with the extent to which the notion of literacy could be applied not just to written texts, but also to different forms of information and media[53].

Advocates of information literacy argued that young people need to be furnished with the skills to make sense of their growing access to information. Information literacy experts pointed out that as information becomes increasingly accessible, this requires a reconsideration of our cultural norms and cultural practices. Young people need to think about what information they can trust and what makes information credible[54]. Information literacy is presented by such researchers as a skill set which revolves around developing proficiency in handling and processing information.

Media literacy experts pointed out that media such as TV, film, adverts and computers have played an increasing part in people's lives over the past half century[55]. The ways that these sorts of media work are not always transparent and both children and adults may find it challenging, for example, to work out who owns and produces media and technology, and what corporate interests are being represented by them.

Studies also emphasise that media literacy is not something which just exists in the head of individual children. Media literacy arises from the interface and interaction between media and user. It is a social practice involving interpretation and production of shared meanings rather than an individual skill set.

Information literacy

It is suggested that the 20 main skills which make up information literacy are:

questions, defining the task, making decisions, brainstorming, problem solving, identifying sources, locating sources, selecting sources, finding information within sources, reading for meaning, skimming and scanning, evaluating material, note-making, sorting and arranging, developing ideas, presenting findings, writing clearly, rhetoric, citing sources, evaluation and review.[56]

Media literacy is therefore defined as the ability to access, analyse, evaluate and create messages across a variety of contexts:

Access: Access to digital media is a social process, not a one-off act of provision. Once initial access is established, users need to continually modify the conditions of access (updating, upgrading and extending hardware and software applications). Problematically, given socio-demographic inequalities, inequalities in access to online knowledge, communication and participation will continue.

Analysis: People's engagement with both print and audiovisual media relies on a range of analytic competencies. In the audiovisual domain these include an understanding of the categories, technologies, languages, representations and audiences for media. At present, not only is an account of internet-related analytic skills highly underdeveloped but the public has yet to develop such skills and so to make the most of online opportunities.

Evaluation: There is little point in access or analysis without judgement, but the scope and purpose of evaluation is not clear-cut. Is media literacy intended to promote a democratised, diverse approach to online representations or should it underpin a more traditional, hierarchical discrimination of good from bad, authoritative from unauthorised, information and communication?

[53] The notion of 'information literacy' derives largely from the literature on library and information systems whilst the notion of 'media literacy' derives largely from the literature on media education. A detailed description of a range of 'digitally related literacies' is provided by Martin, A (2006). Literacies for the digital age, Martin, A and Madigan, D (eds) Digital Literacies for Learning. Facet Publishing.

[54] See Gilmor, D (2008). Principles for a New Media Literacy. Berkman Center for Internet and Society.

[55] Livingstone, S (2002). Young People and New Media: Childhood and the changing media environment. Sage.

[56] See Grey, D (2008). Getting the Buggers to Find Out. Continuum.

Content creation: Although not all definitions of media literacy include the requirement to create, it is argued first, that people attain a deeper understanding of the conventions and merits of professionally produced material if they have direct experience of content production and second, that the internet is a medium which offers previously unimagined opportunities for ordinary people to create online content. To exclude this from a definition of media literacy would be to greatly under-utilise the potential of new media for the public[57].

This is a more developed version of Ofcom's notion that media literacy is "the ability to access, understand and create communications in a variety of contexts"[58]. It is clear that these models have informed recent work defining digital literacy as the ability to define, access, understand and evaluate, create, and communicate.

Growing access to information and increasingly pervasive media mean, then, that young people have to engage in complex literacy practices in order to successfully negotiate their everyday lives at school and at home.

Media Relate

The Media Relate initiative has developed a set of resources and materials to support teachers and learners to explore the role of print, TV and digital media in sex education. Aimed at use in PSHE and citizenship lessons at Key Stage 3, the Media Relate resources focus on the ways in which media act as powerful influences on young people's understanding about sex and relationships, and emphasise how young people need to develop specific analytical skills, knowledge and vocabulary to respond to this media content.

In practice, Media Relate activities seek to develop these analytical skills through focusing on the ways in which sex and relationships are represented and communicated to particular youthful target audiences of various media formats. This includes analysing the portrayal of sex and sexuality in magazines, pop music, on television, on websites, and even in computer games.

The task for teachers is to support the development of students' 'media literacy' about sex, that is, the ways in which they gain access to sexual content through media, the ways in which they interpret sexual content, and the ways in which they can themselves use different media to create and communicate their own messages about sex and relationships.

Media Relate is a good example of an approach to a sensitive aspect of the curriculum that interrogates young people's own uses of the media and digital technology, and then seeks to enhance their ability to be analytical about it and creative in making their own media products.[59]

Multi literacies

Some recent and largely conceptual research has suggested that there is not just one 'literacy' but instead a plurality of literacies[60]. Literacy may involve multiple practices and different technological and media environments may require different formulations of literacy skills (the specific competencies required to take part in a social network site, for example, may not be identical to those required to contribute to a wiki)[61]. This means both that some young people may display high levels of literacy in one medium but less developed levels in another and that literacy practices are continually changing as technology develops[62].

[57] Adapted from Livingstone, S (2003). What is Media Literacy? www.lse.ac.uk/collections/media@lse/pdf/What_is_media_literacy.doc.

[58] See Ofcom (2009). Report of the Digital Britain Media Literacy Working Group. Ofcom were given responsibility for promoting media literacy by the 2003 Communications Act. The 2009 Digital Britain report also tasks Ofcom with overseeing a Consortium of Stakeholders to drive the 'national plan for digital participation.' This recommendation assumes that 'media literacy' is a technical term that is poorly understood by the general population.

[59] See: www.mediarelate.org.

[60] Lankshear, C and Knobel, M (2008). Digital Literacies: Concepts, policies and practices. Peter Lang Publishing.

[61] See Cope, B and Kalantzis, M (2000). Multilitearcies: Literacy learning and the design of social futures. Routledge.

[62] Martin, A and Madigan, D (2006). Digital Literacies for Learning. Facet Publishing.

This research suggests that we need to think about how contemporary society requires literacy skills that can be applied to different forms of representation and can adapt and keep pace with rapid rates of technological change. Young people may need to be able to 'read,' evaluate and produce not just traditional written language but also hyperlinks and e-mails, videos and podcasts, pictures and animations, music and the spoken word, as well as any number of emerging new forms of communication. This means that literacies in contemporary society are multi dimensional, multi modal and changing and cannot be understood as one single set of skills. Although they may involve different formulations, it is also important to stress that all of these differing forms of literacies are likely to involve a strong emphasis on critical thinking skills and on the ability to read, write and produce meaning using different texts and modes of communication[63]. Thus, effective digital participation requires that students are able to adapt their 'reading,' 'writing,' 'listening' and 'speaking' skills to widely differing modes of communications.

Learning by Design

The Learning by Design framework is an attempt to imagine and test innovative tools and learning environments around the use of digital technologies. It includes a focus on multi litearcies and provides suggestions for activities and ways of documenting those activities. The authors suggest that their guide can be used to document and manage lesson plans and to collaborate with colleagues to produce innovative learning experiences.

The guide, for example, gives a number of activities which students might complete in response to the set task: "discuss what's behind a text. How does money, power, self-interest come into it? How does idealism, morality, principle come into it? How does ideology, propaganda, rhetoric come into it?"

The guide suggests that students might address this task, for example, by completing (either online or offline) a critical assessment tool, a cost-benefit analysis or a SWOT analysis, a risk analysis, arranging a formal debate on the issue or creating a poll. It provides materials for each of these tasks.

The guide also provides suggestions for asking students to work collaboratively on projects. If, for example, a teacher wants students to research a particular scientific or mathematical problem, it suggests that they could ask students to move through an action research plan involving a cyclical process of planning, acting, observing and reflecting. It provides steps for students to go through to overcome problems they may encounter along the way (e.g. a conflict resolution plan and a decision making strategy).

It also offers a schema which it claims can help teachers to track the knowledge processes of:

_ experiencing

_ conceptualising

_ analysing

_ applying

and to track how well a learner is moving from:

_ the competence to think and act with assistance

_ to the competence to think and act independently

_ to the competence to perform collaboratively.

It therefore sets out assessment criteria under these three levels (assisted, autonomous, collaborative) under the headings of experiencing the known, experiencing the new, conceptualising by naming, conceptualising by theorising, analysing functionally, analysing critically, applying appropriately, applying creatively. [64]

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[63] The New London Group, for example, argue that meaning and communication are made using a combination of different modes. These include written language, oral language, visual representation, audio representation, tactile representation, gestural representations, spatial representations. New London Group (2000). A Pedagogy of Multiliteracies: Designing social futures, in: Cope, B and Kalantzis, M (eds) Multiliteracies: Literacy learning and the design of social futures. Routledge.

[64] Cope, B and Kalatnzis, M (2005). The Learning by Design Guide Common Ground.

Digital literacy and critical digital literacies

The notion of digital literacy provides a conceptual juxtaposition of literacy, media and information literacy and multi literacies and applies them directly to the use of digital technologies. Like the term literacy, digital literacy is often used to refer solely to functional skills. Microsoft, for example, has created a 'digital literacy curriculum' currently available in 30 languages which aims to "teach and assess basic computer concepts and skills so that people can use computer technology in everyday life to develop new social and economic opportunities for themselves, their families, and their communities"[65].

Whilst enabling young people to use computer technology effectively is one important component of digital literacy, this can be integrated with attention to wider issues such as how and why we use computers and how this affects the meaning that we produce and receive.

The notion of digital literacy, then, refers to 'ideas not keystrokes' and is defined as the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. Critical thinking rather than technical competence is the core skill of digital literacy[66]. Digital literacy can therefore be thought of as a combination of:

_ social awareness

_ critical thinking

_ knowledge of digital tools

These three components should also be supplemented with the idea that digital literacy also involves the ability to participate in the active and collaborative creation and communication of meaning[67].

Some researchers suggest that when referring to the critical and creative participatory aspects, the term 'critical digital literacy' should be used to illustrate a concern with critical thinking skills, not just the skills of writing as applied to digital media. Guy Merchant, for example, argues that metaphorical uses of the term literacy are often misleading. He thinks that 'digital literacy' should be used to refer specifically to the "communication of meaning through written representation" which is mediated by technology. Critical digital literacy, on the other hand, can refer to the critical practices of learning about power, responsibilities and ethical considerations. He believes that critical digital literacy may be best thought of as an 'entitlement' which includes the right to explore and experiment with one's own digital space and the rights to critique and resist dominant or dominating discourses in digital domains. Merchant concludes that innovative work is needed to develop classroom approaches to critical digital literacy that "will prepare children and young people to play an active and critical part in the digital future"[68].

E-mail and PowerPoint in primary schools

Two primary schools in Derbyshire and Sheffield took part in a project which aimed to explore the ways new technologies might transform literacy practices in the classroom. The project involved students from the Derbyshire school being paired with students from the Sheffield school in order to prepare a joint PowerPoint presentation on children's views and interests. The children from the two schools used e-mail to communicate with each other during the process of researching and preparing the presentations. A recent article which reports on the project concludes that it encouraged the development of ICT skills in a meaningful context. In its use of new technology to offer children opportunities to explore broader notions of literacy, new kinds of relationships and new forms of communication and learning, the project began "to suggest possible avenues towards what may sometimes seem an unrealisable goal of transformation of the curriculum"[69].

[65] See www.microsoft.com/about/corporatecitizenship/citizenship/giving/programs/up/digitalliteracy/default.mspx.

[66] Gilster, P (1997). Digital Literacy. Wiley.

[67] See www.slideshare.net/TabethaNewman/digital-literacy-literature-review-from-terminology-to-action.

[68] Merchant, G (2007). Writing the Future in the Digital Age. Literacy, 41,3: 118-128.

[69] Burnett et al. (2006). Digital connections: transforming literacy in the primary school. Cambridge Journal of Education, 36,1: 11-29.

Participatory cultures and digital participation

The definitions and model of digital literacy explored above emphasise the participatory aspect of literacy. Possessing critical digital literacy is an essential component of being an effective and discerning digital participant. The term digital participation has recently been appropriated in a variety of contexts. The concept of a 'participatory culture' of youth new media usage has been popularised in some key US academic research, for example, while in the UK context there is an increased policy emphasis on young people as 'active participants' in their local communities. At the same time, there is a body of emerging work on children's marketing that sees children as active, participative and discerning 'consumers' of products and services.

Participation

The author of a prominent American 'white paper' on participatory culture, for example, argues that,

> Educators must work together to ensure that every ... young person has access to the skills and experiences needed to become a full participant, can articulate their understanding of how media shapes perceptions, and has been socialized into the emerging ethical standards that should shape their practices as media makers and participants in online communities[70].

It is worth unpicking this work in a little more detail because it offers a rich and descriptive account of 'participation' as an educational ambition. It suggests that young people already have opportunities to participate in sophisticated civic, social and leisure activities when online, for example through:

_ **Affiliations:** Memberships, formal and informal, in online communities centered around various forms of media (such as Friendster, Facebook, message boards, metagaming, game clans, or MySpace).

_ **Expressions:** Producing new creative forms (such as digital sampling, skinning and modding, fan videomaking, fan fiction writing, zines, mash-ups).

_ **Collaborative:** Problem-solving - working together in teams, formal and informal, to complete tasks and develop new knowledge (such as through Wikipedia, alternative reality gaming, spoiling).

_ **Circulations:** Shaping the flow of media (such as podcasting, blogging).

However, these four forms of participation are not unproblematic and are subject to three particular challenges:

_ **The Participation Gap:** The unequal access to the opportunities, experiences, skills, and knowledge that will prepare youth for full participation in the world of tomorrow.

_ **The Transparency Problem:** The challenges young people face in learning to see clearly the ways that media shape perceptions of the world.

_ **The Ethics Challenge:** The breakdown of traditional forms of professional training and socialisation that might prepare young people for their increasingly public roles as media makers and community participants.

The new literacies of participatory culture

The new literacies almost all involve social skills developed through collaboration and networking. These skills build on the foundation of traditional literacy, research skills, technical skills and critical analysis skills taught in the classroom.

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.

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[70] Jenkins, H (2007). Confronting the Challenges of Participatory Culture: Media education for the 21st century. The MacArthur Foundation.
www.newmedialiteracies.org/files/working/NMLWhitePaper.pdf.

Simulation: The ability to interpret and construct dynamic models of real-world processes.

Appropriation: The ability to meaningfully sample and remix media content.

Multitasking: The ability to scan one's environment and shift focus as needed to salient details

Distributed cognition: The ability to interact meaningfully with tools that expand mental capacities.

Collective intelligence: The ability to pool knowledge and compare notes with others toward a common goal.

Judgment: The ability to evaluate the reliability and credibility of different information sources.

Transmedia navigation: The ability to follow the flow of stories and information across multiple modalities.

Networking: The ability to search for, synthesize and disseminate information.

Negotiation: The ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms.

These three challenges demonstrate that digital participation cannot be assumed to develop automatically from young people's engagement in digital media cultures, even where this engagement is of a very high level and involves extremely sophisticated types of activities, associations and affiliations. Instead, supporting the development of learners' literacy and their participation is a process which, the research finds, requires the direct support of education professionals and which needs to be written into curricular aims. Another significant project report argues that,

If it were possible to define generally the mission of education, it could be said that its fundamental purpose is to ensure that all students benefit from learning in ways that allow them to participate fully in public,

community and economic life. Pedagogy is a teaching and learning relationship that creates the potential for building learning conditions leading to full and equitable social participation[71].

Schools, then, have a responsibility to enable and empower their students to participate in online and offline worlds. The research views digital participation as a contribution to the complex democratic project of attempting to mitigate the inequalities caused by social class and ensure positive outcomes for all students regardless of their gender, ethnicity and social background. Adults, including education professionals, should "facilitate young people's engagement with digital media" because "participation in the digital age means more than being able to access serious online information and culture. Youth could benefit from educators being more open to forms of experimentation and social exploration that are generally not characteristic of educational institutions"[72]. Participation in sophisticated educational activity is, then, related to forms of participation that may be required in civic and social life.

Using the word 'participation' indicates a view of young people as active participants in digital media environments. The focus is not on new media or digital artefacts in and of themselves, but on the social and intellectual activities such media and technologies allow young people to participate in, and in how such activities might be mobilised in schools. The idea is that students who are digitally literate will be able to think carefully about what they are participating in and how the terms of their participation may be constrained or limited by commercial, social, political or ideological factors. In situations where they have the choice, they will be able to make informed decisions about when they do and do not want to participate both online and offline. This will improve their chances of getting good jobs, contributing to political processes and being involved in their communities.

71 Cope, B and Kalatnzis, M (2005). Learning by Design. Common Ground.
72 Ito, M (2008). Living and Learning with New Media: Summary of findings from the digital youth project. MacArthur Foundation. www.macfound.org/atf/cf/%7BB0386CE3-8B29-4162-8098-E466FB856794%7D/DML_ETHNOG_2PGR.PDF.

There are also some important challenges involved in using the word 'participation', however. Encouraging young people to participate can be tokenistic and counter-productive unless there is a meaningful channel for their participation. For some researchers 'participation' is only possible when children are empowered and have the agency to make changes to the circumstances which affect their daily lives[73]. This may include, for example, effecting change in the way the school or their local authority is run. Encouraging children to participate encourages them to believe that they will be listened to. Where this is not the case, this can be a disheartening experience for young people and contribute to feelings of apathy.

'Digital participation' can be used to refer to participation in the production of knowledge rather than, necessarily, in formal political processes. It is, however, important to be aware of these political issues and to understand the ways they interlink with questions of knowledge and education. Indeed, the encouragement of any kind of 'participation' at all cannot help but raise a number of questions about how schools are implicated in producing certain forms of citizenship in young people and about whose interests this serves[74]. It also raises questions about how the notion of children's 'participation' can often be appropriated to mean the ability to be an active and discerning 'consumer' of material goods and popular culture.

Whilst both the terminology and the ideas that lie behind ideas of digital participation can be complex, schools can help students to negotiate these complexities and prepare for changing working, civic and social lives. Finding strategies to support young people's participation in everyday life in a digital media age are at the centre of concerns about the taught curriculum, and particularly concerns about the quality of technology in schools and the extent of teachers' training in the use of digital media to enhance the curriculum.

Technology in schools and teacher training

Whilst there has been increasing investment in ICT equipment in recent years and access to computers and other technology in schools has improved, there are still some challenges around the quantity, quality and use of technology in schools. In some schools, the majority of computers may still be located in ICT suites which are heavily used and can be difficult for teachers to book out. In addition to this, the rate of technological change often means that technology in school becomes quickly outdated. Mobile phones and mobile devices are often banned in the classroom even though in some instances they may by more powerful than the computers provided by schools[75]. There may also be challenges in relation to the provision of hardware and software, teachers' ability to obtain information about hardware and software, school practices of blocking and filtering online content, unreliable internet connections and the logistical problems of finding funding for extra equipment or the organisation of timetables[76]. This suggests that there is a continuing need for investment in ICT infrastructure in schools.

The process of integrating technology across the curriculum also places additional demands on teachers. Whilst there are many ways in which digital technology can be used as a tool for teaching subject knowledge, integrating knowledge of digital technology with the development of subject knowledge is likely to require altered pedagogical techniques, as well as the development of different knowledge, outlooks and skill sets in teachers. However, there are wide variations in the confidence, skills and knowledge that individual teachers themselves possess around digital technology and media. The 2008 Harnessing Technology Schools Survey, for example, found that encouraging the use of social software such as blogs, instant messaging, wikis and online discussion groups to support learning is still extremely uncommon in UK schools, although there

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[73] See, for example, Sonia Livingstone's 2008 presentation at the International Media Literacy Research Forum: www.youtube.com/watch?v=fy6MLaNUBVU.

[74] For further information relating to citizenship, participation and young people see Lawy, R and Biesta, G (2006). Citizenship-as-Practice: The educational implications of an inclusive and relational understanding of citizenship. British Journal of Educational Studies, 54,1: 34-50; and Watts, M (2006). Citizenship Education Revisited: Policy, participation and problems. Pedagogy, Culture and Society, 14,1: 83-97.

[75] For further details on ICT equipment and levels of use see Smith, P, Rudd, P, and Coghlan, M (2008). Harnessing Technology: Schools survey 2008. National Foundation for Education Research and Becta.

[76] Burn, A and Durran, J (2007). Media Literacy in Schools: Practice, production and progression. Paul Chapman.

has been a slight increase since 2007 in the number of teachers saying that they do this. A sizeable minority of teachers (especially in primary schools) are completely unfamiliar with these types of software; even in secondary schools, a quarter of teachers had never heard of wikis. This contrasts with the very high use of these types of software among young people for informal purposes[77].

Other research suggests that many teachers use technology only sporadically and may not adapt their teaching methods to this use. This can result in unimaginative uses of technology that simply replicate existing practices and can mean that technology is only used extensively and effectively by a minority of teachers instead of becoming fully, meaningfully and sustainably integrated throughout the curriculum[78].

Teachers are, of course, on the receiving end of multiple demands and they need support in developing their confidence and understanding of what technology can offer and how to use it effectively. This requires both enhanced continuing professional development (CPD) and the support of senior management. It also has implications for what sort of CPD for using ICT in classroom practice is offered. A lot of ICT CPD for teachers currently concentrates on skills training rather than the practice and pedagogy of using ICT effectively and thoughtfully. This may be the result, at least in part, of the fact that policy and research is usually developed without the involvement of teachers. It has been pointed out, for example, that,

> there are many 'local' reasons why technology has failed to transform learning in the manner that many of its advocates have envisaged. Yet perhaps the overriding one is to do with the centralised, top-down nature of the innovation itself. The pressure for change has come largely from government and from industry, rather than from teachers themselves[79].

The success or otherwise of school-based innovation and curriculum reform is often related to local circumstances and to the characteristics of particular schools, teachers and children[80]. Successful change in schools therefore requires that teachers and students are involved in planning processes and implementation. This also extends to a need to involve teachers in the development of evidence about effective strategies for encouraging digital participation across the curriculum and in defining their continuing professional development needs.

New UK ICT CPD programme

The Open University and e-skills UK have recently launched a nationwide programme to help teachers bring technology more effectively into the classroom.

Funded by the Department for Children, Schools and Families (DCSF), the £5.6 million programme will help education professionals, at both primary and secondary levels; build their information and communications technology (ICT) skills, stay up to date with the latest developments and meet the needs of an increasingly technology-savvy generation of young people. The aim is to create a 'step change' in the quality of ICT teaching in English schools.

Significantly, the programme aims to make widespread use of digital media, thus demonstrating its potential for teachers' own learning as well as its potential for use in the school classroom. This includes the development of online clusters of expertise and the use of virtual worlds such as Second Life to facilitate communication between practitioners during their professional development[81].

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77 See n.75
78 This has been detailed in Schofield, JW (1995). Computers and Classroom Culture. Cambridge University Press, and more recently analysed by Somekh, B (2007). Pedagogy and Learning with ICT: Researching the art of innovation. Routledge.
79 Buckingham, D (2007). Beyond Technology: Children's learning in the age of digital culture. Polity.

80 For more information on managing change and innovation around ICT in schools see, for example, Sutch, D, Rudd, T, and Facer, K (2008). Promoting Transformative Innovation in Schools. Futurelab; and Becta (2009). Enabling Next Generation Learning: Enhancing learning through technology - A Guide for those who work with schools. Becta.
81 See www3.open.ac.uk/media/fullstory.aspx?id=16523

Summary

In this review we have presented the recent research focusing on the development of digital participation in schools. There are several developments which need to happen in and around schools to enable and empower them to prepare their students for an increasingly digital world. There are also several potential challenges which need to be taken into account when designing classroom strategies to put research and policy on digital participation into practice in real school settings.

These challenges may be beyond the control of individual teachers but they need to be acknowledged and discussed so that it is clear what sorts of factors might prevent teachers from responding to the additional demands placed on them around digital literacy and digital participation. It is important to be realistic about what is achievable in schools even whilst we attempt to push the boundaries of current practice in order to offer the best grounding possible for the development of young people's digital literacy and their effective digital participation.

Focusing on digital literacy and participation is considered important not only because of the current policy emphasis on creating a 'Digital Britain' by developing ICT skills across the curriculum, but also because of a number of pressing social and cultural imperatives. These include the need to furnish children with the ability to be technologically competent and ask relevant, appropriate and critical questions of an increasingly media and technology saturated world.

A series of conceptual and pedagogical models has emerged from recent research which aim to support the development of digital literacy and young people's participation in the classroom. These models suggest that the development of learners' digital literacy requires them to define a task or question, access information which will help to complete this task or answer the question, understand and analyse this information, re-contextualise it and relate it to other knowledge, in order to create an answer to the question and communicate the results. At all stages of the process, young people need to reflect critically upon what they have been doing, as well as deciding what sort of digital or non-digital tools are appropriate to the task.

Digital participation involves applying a set of social literacy practices to digital technology and digital media. These literacy practices involve developing an understanding of the operational, the cultural, the critical and the creative in relation to the use of a wide range of digital technologies and online tools. Digital participation, then, is dependent on having the ability to use technology, media and information appropriately and safely in order to produce, receive, analyse, create and communicate meaning and to continually ask questions about the meaning that is being received and communicated. Possessing critical digital literacy is an essential component of becoming digitally participative.

Supporting young people to make careful and informed decisions about how and why they participate digitally is an important response to the commercialisation of childhood, to the need for 'e-safety' and to children's increasing use of digital technology outside of the classroom. Being included as a digital participant means not only having access to technology and knowing how to use it; it also means knowing about technology, its origins and the political economy of digital media production. This requires young people to recognise that computers, video games, websites and social networking sites, for example, are not neutral tools but instead are owned and produced and may exhibit particular biases and represent particular interests.

By promoting the digital literacy development of learners through the curriculum, teachers are able to contribute to enhancing their potential for participation in digital media. This means enhancing young people's ability to use digital media in ways that strengthen their skills, knowledge and understanding as learners, and that heighten their capacities for social, cultural, civic and economic participation in everyday life.

About Futurelab

Futurelab is passionate about transforming the way people learn. Tapping into the huge potential offered by digital and other technologies, we are developing innovative learning resources and practices that support new approaches to education for the 21st century.

Working in partnership with industry, policy and practice, Futurelab:

_ incubates new ideas, taking them from the lab to the classroom

_ offers hard evidence and practical advice to support the design and use of innovative learning tools

_ communicates the latest thinking and practice in educational ICT

_ provides the space for experimentation and the exchange of ideas between the creative, technology and education sectors.

A not-for-profit organisation, Futurelab is committed to sharing the lessons learnt from our research and development in order to inform positive change to educational policy and practice.

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