

# truth, lies and the internet a report into young people's digital fluency

Jamie Bartlett  
Carl Miller

September 2011

---

DEMOS

# TRUTH, LIES AND THE INTERNET

Jamie Bartlett  
Carl Miller

September 2011

## Open Access. Some rights reserved.

As the publisher of this work, Demos wants to encourage the circulation of our work as widely as possible while retaining the copyright. We therefore have an open access policy which enables anyone to access our content online without charge. Anyone can download, save, perform or distribute this work in any format, including translation, without written permission. This is subject to the terms of the Demos licence found at the back of this publication. Its main conditions are:

- Demos and the author(s) are credited
- This summary and the address [www.demos.co.uk](http://www.demos.co.uk) are displayed
- The text is not altered and is used in full
- The work is not resold
- A copy of the work or link to its use online is sent to Demos.

You are welcome to ask for permission to use this work for purposes other than those covered by the licence. Demos gratefully acknowledges the work of Creative Commons in inspiring our approach to copyright. To find out more go to [www.creativecommons.org](http://www.creativecommons.org)



## PARTNERS CREDITS

In collaboration with the Nominet Trust  
<http://www.nominettrust.org.uk/>

Published by Demos 2011  
© Demos. Some rights reserved.

Third Floor  
Magdalen House  
136 Tooley Street  
London SE1 2TU

T 0845 458 5949  
F 020 7367 4201

[hello@demos.co.uk](mailto:hello@demos.co.uk)  
[www.demos.co.uk](http://www.demos.co.uk)

## EXECUTIVE SUMMARY

The internet is now almost certainly the greatest source of information for people living in the UK today. We use it to read up on what is happening in the world, to get advice about things that worry us, to argue and collaborate, to decide who to vote for and who to date. The information we access and consume on the internet is central to forming our attitudes, our beliefs, our views about the world around us and our sense of who we are within it.

The amount of information available to us at the click of a mouse when making these decisions can be both liberating and asphyxiating. Although there are more e-books, trustworthy journalism, niche expertise and accurate facts and figures at our fingertips than ever before, there are equally unprecedented amounts of mistakes, half-truths, mistruths, propaganda, misinformation, disinformation and general nonsense.

Making sense of all this – knowing how to discriminate the good, reliable, trustworthy or useful information from the bad – is therefore of tremendous importance. The ability to make these difficult judgments matters to everyone but especially young people, for whom the internet is a more important medium than any other group.

Our research shows, however, that many young people are not careful, discerning users of the internet. They are unable to find the information they are looking for or trust the first thing they do. They do not apply fact checks to the information they find. They are unable to recognise bias and propaganda and will not go to a varied number of sources. As a result, they are too often influenced by information they should probably discard.<sup>1</sup> This makes them vulnerable to the pitfalls and rabbit holes of ignorance, falsehoods, cons and scams. Inaccurate content, online misinformation and conspiracy theories (such as those which surrounded the death of Osama bin Laden) are appearing in the classroom.

The potential consequences of this on society as a whole are unknown. One danger is that young people are more likely to be seduced by extremist and violent ideas. As we have argued

elsewhere, many terrorist groups are fed by bogus online material circulating unchallenged on online echo chambers. Anders Breivik, the recent Oslo terrorist, is a devastating but only the most recent example of the power of internet material to radicalise.

The answer is not greater censorship or a tighter control over internet content. The task is to ensure that young people can make careful, skeptical and savvy judgments about the internet content they will, inevitably, encounter. This would allow them to better identify outright lies, scams, hoaxes, selective half-truths, and mistakes, and better navigate the murkier and greyer waters of argument and opinion.

The ability to judge the merits of different pieces of information is not new; it is the basis of much of classical philosophy. However, the architecture and functionality of the internet makes the job of separating the wheat from the chaff even harder. A specific body of skills and knowledge is required to make informed judgments. We use the term ‘digital fluency’ to describe this competence: the ability to find and critically evaluate online information. It is a combination of ‘old’ critical thinking skills, such as source verification, and ‘new’ knowledge about how the digital world works, such as understanding search engines. These are the bedrock skills necessary for the individual to use the internet to search, retrieve, contextualise, analyse, visualise and synthesise information effectively.

We undertook two new pieces of research to determine the extent of digital fluency among young people in the UK. First, we reviewed current literature relating to digital fluency, including 17 surveys and other research papers, studies and reports undertaken between 2005 and 2010. Second, we conducted a survey of 509 teachers in England and Wales about the extent of their pupils’ digital fluency.

## Findings

Our literature review revealed that ‘digital natives’ (12-18 year olds) are very confident users of the internet, but are not particularly competent. There is some evidence to show that some young people are discerning, careful internet users, but much else that indicates that the skills of digital natives do not match their own self-reportage:

- **Too many digital natives do not apply checks on the information they access:** around one in four 12-15 year olds make no checks *at all* when visiting a new website, and less than one in ten ask who made the site and why.
- **Aesthetics over quality:** decisions about information quality is based on site design, rather than more accurate checks – around one-third of 12-15 year olds believe that if a search engine lists information then it must be truthful; and 15 per cent don’t consider the veracity of results but just visit the sites they ‘like the look of’.
- **Lack of teaching:** only one-third of 9-19 year olds have been taught how to judge the reliability of online information. Fifty-five per cent of teachers surveyed in 2008 felt their students ‘did not have sufficient understanding of what plagiarism was and what counts as legitimate research’.

Between May 16<sup>th</sup> and July 16<sup>th</sup> 2011, Demos conducted an online survey of primary and secondary school teachers in England and Wales about their views on their pupils’ digital fluency, and how it might be taught in school. In total, we received 509 responses. This is the largest survey of its kind ever conducted.

The intention of the survey was to evince general attitudes within the teaching profession towards several themes: the importance of the internet and digital fluency skills; the extent of their pupils’ current digital fluency; and the state of digital fluency within the school. To this end, a sample with a reasonable spread of teachers (by seniority, subject and class-age) and schools (by geographical locale, school-type and sector), rather than a completely

representative profile of all teachers and schools, was required. The results of the survey are therefore not perfectly representative of the teaching profession as a whole. The online survey methodology and publication strategy we employed did not allow for a totally representative series of distributions and proportions within the sample cohort. However, we did apply post-stratification weightings (according to subjects taught, as measured by the School Workforce Census) to improve representativeness. It is with this caveat in mind that we present these data. A full methodology is available in the annex.

The findings include:

- **Internet teaching and learning is fundamental to pupils' school and personal lives:** 88 per cent of teachers surveyed consider internet-based research to be important for their pupils' schoolwork; and 95 per cent report that their pupils have brought information into the classroom they have found online. 75 per cent believe that internet-based content to be important in the formation and validation of their pupils' beliefs.
- **Teachers are worried about their pupils' digital skills:** 99 per cent of teachers surveyed think that digital fluency is an important skill for pupils to possess, but across a range of measures, teachers rate their pupils' digital fluency skills as below average. In particular, the application of fact-checks or other source verification on the online information they consume, the ability to recognise bias or propaganda, and the variety of sites they visit, are rated most poorly.
- **Misinformation, propaganda, and conspiracy theories are being brought into the classroom:** 47 per cent of teachers surveyed<sup>2</sup> report having encountered arguments within lessons or submitted schoolwork that contain inaccurate internet-based content they regard as deliberately packaged by the producers to be misleading or deceitful (for example, holocaust denial packaged as radical historical revisionism). 18 per cent report this happens on at

least a monthly basis. Perhaps more surprisingly, 48 per cent of teachers surveyed<sup>3</sup> report having had arguments in class with pupils about conspiracy theories. More than one in five reported this happening on a monthly basis.

- **Teachers believe overwhelmingly that digital fluency needs to be given more prominence in the classroom:** 99 per cent of teachers surveyed consider digital fluency to be an important skill for young people to possess; and 88 per cent<sup>4</sup> think it should be given more prominence in the national curriculum.

Combining our survey results with the background literature review, we believe information literacy teaching in schools is struggling to keep pace with the rise of the internet. The internet has become central to learning, but the skills to use it appropriately and well have not become central to learning how to learn.

### Recommendations

We recommend a major campaign to place digital fluency at the heart of learning. In a context where young people are confronted with such a vast array of information, having the skills and knowledge to evaluate and assess that information is a fundamental skill that all children must possess. The government, schools, internet companies and providers, creative agencies, libraries and parents all have a role to play.

**Digital judgment must become a core part of the National Curriculum and teacher training.** The Government should include digital fluency as a ‘core competency’ in the National Curriculum during its current review. Digital fluency is a foundational, core skill that should underlie teaching and learning across all subjects, and is not confined to a single subject. As a minimum, all schools must teach pupils about search engines, propaganda techniques, source attribution techniques, and the risks of data-sharing.<sup>5</sup> Although there are some promising initiatives in some schools, coverage is patchy and too many schools do not teach



it. Given that an increasing number of schools will be operating outside the National Curriculum, this is something that academies and free schools should also take on themselves. The Department for Education must also ensure that these skills are taught as part of teacher training programmes.

**The Department for education should join forces with the private sector and third sector to create a set of teacher resources.** The majority of teachers we surveyed were happy to teach digital judgment, but many said they need the materials, support and training to do so. Some teachers may lack confidence in relation to their use of ICT and do not always have the time to rectify it.<sup>6</sup> Both the Department for Education and internet companies such as Google and Yahoo! should create materials that can be used in the classroom, and where possible, teaching assistance. A bespoke web presence should be created to provide an overarching context for digital fluency teaching, organising the links, materials, lesson plans and examples necessary for classroom teaching.

Misinformation often thrives because it is more attractively packaged and disseminated as sharable, social media-friendly products. Teaching resources must use the same techniques to teach as young people use: YouTube videos, webinars, interactive tasks and podcasts. Moreover, internet-borne misinformation often thrives on anti-establishment kudos, as a way for young people to assert independence of mind. A digital fluency campaign must not overly identify with authority, and should also include material that provide the opportunity to critique and discuss establishment (be it official, government or school) decisions or actions.

**Parents need to take a more active role in managing and guiding their children's online consumption, and encourage critical thinking.** A decade ago, most children first encountered technology at school – now it is in the home.<sup>7</sup> This is a dramatic change, because internet use at home is relatively unsupervised for young people: over half of 12-15 year olds say they 'mostly use the internet alone', and 41 per cent of parents of this age group say that their child has access to the internet in their

bedroom, a rise from 31 per cent in 2009.<sup>8</sup> Many parents think that the digital world is alien to them – a mysterious place inhabited by their ‘digital native’ children. They should not. Offline knowledge and critical thinking skills possessed by parents are of enormous relevance in an online setting, too. Parents need to be part of any campaign, and should start by becoming more familiar and confident with various aspects of internet functionality as part of their child’s general education, and imparting the importance of careful, thoughtful evaluation of information, whatever the source.

## CHAPTER 1 - INTRODUCTION

### New technology

Fear about corrupting young, innocent minds always accompanies new technology. Socrates in Plato's *Phaedrus* famously warned against 'letters', because he thought it would promote forgetfulness. People, he predicted, would become 'the hearers of many things and will have learned nothing'.<sup>9</sup> When the printed book started rolling off Johannes Gutenberg's press, many suspected it would be 'confusing and harmful', overwhelming young people with data.<sup>10</sup> Newspapers, comic books, radio, television, and video games were all closely attended by moral panics, which (mostly) subsided once people became used to them. The advent of the digital age is as revolutionary as any of these technologies.

Like the printed book, the personal and societal benefits of the internet are incalculable. It has dramatically widened access to knowledge and ideas. People use it to expose government corruption. It is a source of advice and guidance, even comfort and love. It has brought people together to collaborate in new and exciting ways: even to help overthrow corrupt government. As authors celebrate our digital future as one variously more democratic, oppression-free, even psychologically united than ever before, very few of us could, or would want to, imagine a world entirely offline.<sup>11</sup>

But, like the printed book, there is also a loudening chorus of voices raising the alarm about a 'darker' side of the internet. Most of these concerns relate to young people, such as the wide availability of pornography, cyber-bullying, internet privacy, and online stalkers and groomers. Some writers have pointed to possible long-term detrimental health effects of online stimulation, such as 'techno-stress', 'data asphyxiation', 'information fatigue syndrome', 'cognitive overload', and 'time famine'.<sup>12</sup> Nick Carr, for example, worries that the internet has made our thinking shallower and less reflective, while Susan Greenfield suggests that the brain's

‘neuroplasticity’ – its ability to physiologically change according to the environment – is adapting to the ‘wow and yuck’ sensationalism of the digital world, resulting in short attention spans, an inability to empathise and a shaky sense of identity.<sup>13</sup> These debates continue to rage.<sup>14</sup>

The government has started to take note, commissioning a series of reports and reviews about internet safety. Most notable is Professor Tanya Byron’s 2008 review, which led directly to the setting up of the UK Council on Children’s Internet Safety.<sup>15</sup> Other public and academic work followed, including Dr Linda Papadopoulos’ review into the sexualisation of young people, and a further follow-up report by Professor Byron. A broad political consensus has emerged in recent years that the government, parents, and industry all need to play a role to ensure children are safe online.

### Information overload?

There is another aspect of the digital age that is less remarked upon, but just as significant: how the internet is changing the way people form beliefs and make decisions.

In 2009, to celebrate the 40<sup>th</sup> anniversary of the internet, the Defense Advanced Research Projects Agency (DARPA) released ten red weather balloons across nine American states. It offered \$40,000 to whichever team could locate them all first.<sup>16</sup> After just nine hours a team from MIT had scooped the prize, by establishing an online platform for viral collaboration, promising cash for each person to give them a correct balloon location, and smaller incentives for those who hooked these people into their network. They used Facebook and Twitter to spread the promise of reward far and wide. As it intended, the competition showed the power of online collaboration when it comes to solving difficult problems quickly. From complex visual recognition algorithms trawling millions of images, to social media campaigns generating enough ‘hype’ or ‘buzz’ to influence tens of thousands, all the contenders focused on online strategies. It was the only way to be in the running.

The post-mortem revealed an interesting lesson. The leading teams agreed the main difficulty was not getting hold of good information – it was how to know what information to trust. The MIT team received more than 200 submissions of balloon sightings, only 30 or 40 of which turned out to be accurate.<sup>17</sup> Some were genuine mistakes (oddly, a large red non-DARPA balloon happened to be hanging over Royal Oak, Michigan, on the same day), while others were deliberate – there were false reports and faked photographs, even sophisticated ‘leaks’ from other teams.<sup>18</sup>

The internet is incredibly powerful, and can be leveraged in astonishing ways to solve complex problems. But its future is staked on how easily and effectively information and disinformation can be disentangled. The key to harnessing and exploiting the internet now is to spot the fakes: to know how to tell the truth from the lies, and how to negotiate the grey areas of comment, opinion and propaganda in between.

### Online epistemology

The internet is now almost certainly the greatest source of information for people living in the UK today.<sup>19</sup> In 2009, 91 per cent of people checked a fact online, 90 per cent investigated topics of personal interest and 71 per cent looked up the definition of a word.<sup>20</sup> We use it to read up on what is happening in the world, and to get advice about health problems and things we don’t much like to talk about publicly.<sup>21</sup> We use it to make decisions about who to vote for.<sup>22</sup> It is central to forming our world-views, our attitudes, and our beliefs.

The sheer amount of information available to make these decisions is entirely novel. When we fire up a browser, we can choose from over 250 million different websites, and 150 million blogs.<sup>23</sup> Over 25 billion tweets were sent in 2010, four billion images are hosted on Flickr, and 24 hours of YouTube footage is uploaded every minute. Last year alone, the content created was several million times more than the amount of information in every book ever written.<sup>24</sup>

As anyone who has spent even a small amount of time online will know, the quality of this information can be far from perfect.

Although there are more e-books, trustworthy journalism, niche expertise and accurate facts and figures than ever before, this is accompanied by equally unprecedented amounts of mistakes, mistruths, propaganda, misinformation, and other general nonsense. An estimated 89 per cent of the 107 trillion emails sent in 2010 were spam-related.<sup>25</sup> By 2009, the Simon Wiesenthal Centre was already warning about the rise of extremist activity on the internet in ‘hate 2.0’. They estimated that the number of hate and terrorist websites had grown by a third that year, to over 8,000. They especially point out the explosive growth and potential influence of such groups on social media, especially Facebook groups.<sup>26</sup>

There is nothing new in the challenge of sorting the wheat from the chaff. The ability to judge the merits of different pieces of information is the basis of one of the oldest philosophical disciplines in the Western tradition: epistemology. Epistemology studies the nature of truth – how we acquire, understand and validate knowledge. Simply put, whether offline or online, we need to distinguish good from bad information and that requires the application of both personal techniques and skills that allow one to make a careful, reasoned judgment.

The centrality of the internet in the formation and consumption of information means that the ability to apply careful discernment and judgment is more important than ever. The architecture, functionality and usage of the internet itself presents some novel difficulties and pitfalls that make judgment even more difficult. These include:

- **The absence of gate-keepers**

How we personally discern good information from the bad usually stems from a system of collectively constructed and supported institutions and norms. Indeed, one of the oldest functions of human cooperation is to create a ‘social epistemology’ to order, categorise and mediate information in order to make the difficult decisions about what to trust a little easier. The peer-reviewed academic journal, the edited

school text-book, the specialist anthology, all act as gatekeepers, expertly posing (at least in theory) certain tests of veracity and authenticity that needed to be passed before the content is permitted into the public sphere. Many of these helpful mediators are absent online. Of course, there are some very effective internet-based filters. One famous test conducted by *Nature* magazine compared whether Wikipedia was more accurate than Encyclopedia Britannica. The old master saw off the challenger – but not by much.<sup>27</sup> Although there are norms, such as Wikipedia’s editing procedures, they are more informal and on many sites, non-existent. In many places, the internet is a largely lawless and anonymous arena that is easy to enter, where there is little backlash for spreading misinformation (although this may be changing).<sup>28</sup> The usual way of acquiring legitimacy – slick website design – is easily in the reaches of most users.

- **Anonymity and the pedigree problem**

No single person knows enough about every subject to make direct judgments about the truth or falsehood of every claim made. In a complex, specialised and esoteric world, we must trust in experts. John Hardwig calls this the ‘novice/expert problem’.<sup>29</sup> An important and fundamental strut of epistemology today is therefore the application of ‘pedigree criteria’.<sup>30</sup> We trust information because of *who* provides it. The internet poses some specific challenges to using pedigree criteria. Much internet discussion occurs in places which are anonymous, or where identity (and therefore authority) can be easily faked. People increasingly rely on visual signs of authority. With anonymity, purveyors of misinformation rarely need to ‘stand by their byline’. Whilst a mainstream publisher must observe defamation and libel law, legal sanction rarely invades the digital free-for-all.

- **The generational divide**

Parents are typically the main guardians of information, to a greater or lesser extent ensuring that the material children consume is age-appropriate, comprehensible, and accurate. With the internet, this supervision is often absent. 48 per cent of parents think their child knows more than them about the internet, rising to 70 per cent of parents of 12-15 year-olds.<sup>31</sup> Only 16 per cent of parents consider themselves advanced internet users, compared to 32 per cent of children.<sup>32</sup> In 2005, among parents, only one in three knew how to set up an email account, fewer than a fifth knew how to set up a filter, 19 per cent remove a virus, 12 per cent download music and 21 per cent fix a problem.<sup>33</sup> According to a recent poll conducted by TalkTalk, children are spending on average over two hours a day on the internet and parents admitted that around half of their children's time online is unsupervised.<sup>34</sup> A number of commentators see a qualitative discontinuity between the 'Digital Natives' and 'Digital Immigrants'.<sup>35</sup>

- **The pseudo-sites and propaganda**

Many websites are not what they seem. Some are created for nefarious ends that are specifically designed to appear trustworthy. The website, <http://www.martinlutherking.org>, purports to present 'a true historical examination' of Martin Luther King Jr., and is aimed specifically at students writing essays for the Martin Luther King Day Essay Contest. The website is a veiled attack on King's reputation and the Civil Rights Movement in general, and is (quietly) hosted by the White supremacist group StormFront. The Institute For Historical Review (<http://ihr.org/>) claims to be a 'non-partisan, non-ideological and non-sectarian' for revisionist historical research. The very partisan, ideological and sectarian pseudo-historical content promotes Holocaust denial.



- **The use of imagery**

With YouTube, Vimeo, Flickr and other social media sites hosting visual content, image manipulation techniques are increasingly allowing misinformation to be powerfully and attractively packaged. The conspiracist film *Loose Change*, which claims that 9/11 was a ‘false flag’ attack perpetrated by elements of the US intelligence, became an internet sensation, attracting millions of views. The litany of errors, misattributions, vague insinuations, subtle misquotes and outright falsehoods were masked by a cool soundtrack by DJ Skooly, atmospheric narration and mesmerising video editing. The film’s various liberties with the truth have now been carefully catalogued, yet it is no accident that this deceptive, if skilfully packaged, video became the first internet blockbuster.<sup>36</sup> More prosaically, inexpensive yet hugely effective and sophisticated image-editing software – to crop, enhance, or outright alter images – exists. Sometimes even newspapers can be fooled. In June 2011, the News of the World paid £70,000 in libel damages to footballer Artur Boruc after wrongly reporting an apparent infidelity. A fraudster fooled the paper with a fake Facebook page, but also a picture of a man’s torso photoshopped to add a monkey tattoo, similar to Boruc’s.<sup>37</sup>

- **The echo chamber**

The internet can sometimes act against the purveyors of misinformation. There is a vibrant community of online debunkers. Sites like <http://www.debunking911.com> and the online Journal of Debunking 9/11 have powerfully challenged conspiracist narratives. Many citizen journalists do the same, line by line, for popular and controversial books, and films. Indeed, some, such as Elise Nickerson, argue that holocaust denial has been weakened in the transfer from books to the web.<sup>38</sup> Yet as interest groups and communities of fellow travellers have coalesced, much of the internet has now formed islands of segregated opinion rather than flows of dissenting argument and engagement. Within these often

fairly closed communities, the two-way flow of information doesn't happen. Dogmatic website administrators and forum moderators often control content with an iron grip. Technologists like Ethan Zuckerman are noticing that internet use is not the 'free and open exchange of information' for which it was originally conceived.<sup>39</sup> Internet use is Balkanised – it actually consists of pretty similar types of people, talking the same language, on the same kinds of topic. Recent research on Twitter, for example, found that 'trending' topics were either overwhelmingly White or African American – and rarely both.<sup>40</sup> A recent study assessed the strategies people use for choosing news, and found that there certainly is more niche targeting of news. They find that 'one clear manner in which the internet appears to differ from other mass media is the degree of niche targeting of political information-oriented websites.'<sup>41</sup>

### Digital fluency

This does not mean that the internet should be censored. Controlling the information that people can access is at the very least ethically dubious, and, from a practical point of view, probably impossible. More fundamentally, there are various architectural principles on which the web is founded that we transgress at our peril:

- *universality*, the ability to link to anything, that content is accessible by anyone
- *decentralisation*, you don't need authorisation from anyone before adding a page or making a link
- and *net neutrality*, Internet Service Providers can't prefer some data transfer – such as their client's – over others, thus servers have to treat all information the same.

Professor Byron in her 2008 independent review has already laid out a powerful ethos for managing risk entailed by going online: to think less about the internet 'causing' harm, and more focusing on what young people bring to these technologies, namely empowering

young people with the skills they need to manage the risks entailed by inhabiting the digital world.<sup>42</sup> The onus must be on individual users to apply careful, reasoned judgments.

This is why the concept of digital literacy is extremely important. Digital literacy has been defined as ‘the skills, knowledge, and understanding that enables critical, creative, discerning and safe practices when engaging with digital technologies in all areas of life.’<sup>43</sup> It comprises several different elements, from e-safety, creativity, technical skills, and cultural understanding.<sup>44</sup>

One important element of digital literacy is what we have termed *digital fluency*: the ability to find and critically evaluate online information.<sup>45</sup> This requires a combination of new and old techniques: a mix of the classic tropes of any discerning historian or journalist with some very specific knowledge about how the internet functions.

## CHAPTER 2 – THE STATE OF DIGITAL FLUENCY

We have used the phrase ‘digital fluency’ to describe that combination of critical thinking, evaluative skills and specific knowledge about online functions that are required to be able to meet hazards particular to the online realm. Digital fluency refers to the skills necessary for the individual to use the internet to search, retrieve, contextualise, analyse, visualise and synthesise information effectively. It has three components:

- *Net-savviness*, a practical understanding of the way the internet works, for instance – the basics of how search engines return results, how user-generated feedback functions, how web-sites are designed and built, how identity can be established and faked, how images and videos can be altered.
- *Critical evaluative techniques*, the knowledge and use of basic checks, techniques and principles that can be applied to assess the trustworthiness and accuracy of information. These are both general critical thinking skills (such as whether users fact-check, triangulate sources, understand the difference between quality of evidence, search for provenance, or distinguish between different qualities of information) and specific online skills such as how filter programmes work, how to make videos and Wikipedia’s process of peer-editing.
- *Diversity*, the extent to which users’ online consumption is broad, varied and diverse. Do users access and consume different and competing pieces of information? Are they aware of the cognitive biases that we are exposed to? Can users identify the *a priori* ideological basis of a particular comment or opinion piece, and place it within the wider fabric of a debate? Are they aware of, and do they use, the websites that have grown up specifically to counter the urban legends, hoaxes and scams that the internet has allowed to bloom?<sup>46</sup>

We have conducted an extensive review of evidence, which allows us to set out the state of digital fluency in the UK today along these three components. In some areas, there is a lack of relevant data but in others there are very good data, such as in Ofcom's digital literacy surveys. In total, we examined 17 pieces of research, conducted in the UK (with some supplementary papers from the US) between 2005 and 2011.

### Net-savviness

Knowing how the internet works is important. Digital fluency relies on understanding how websites are made (and copied), how to check who hosts a website, how search engines apply non-neutral processes to find you information, the ability to recognise authentic websites from faked ones, how pictures and video footage can be manipulated, how the provenance of user-generated content can be traced.

Search engines are of particular importance, because of the central role they play in prioritising the information that people view. Search engines rank results in different ways, and it is important to understand at least the rudiments of how they work. First, search skills are important: subtle differences in the semantic construction of search queries, including the ordering of Boolean operators, the use of synonyms, antonyms and abbreviates can return hugely different results. Second, it's important to know the nature of the returns to these searches. The mechanisms of search engines can be – and often are by PR agencies – manipulated to inflate the relevance of websites, a little like an advertiser hijacking the Dewey Decimal System. There is also a commercial element to webpage ranking, and search engines often offer 'sponsored links' to websites that pay to be elevated. Different search engines apply different mechanisms to search different indexes and therefore, of course, return different results.<sup>47</sup> No search engine produces a neutral, definitive, or representative reflection of what is on the internet.

It is not clear that this complexity is reflected in people's understanding of search engines. 44 per cent of 12-15 year olds who use search engines make some type of critical judgment about search engine results, thinking that some of the sites returned will be truthful while others may not be. However, 31 per cent believe that if a search engine lists information then it must be truthful and 15 per cent don't consider the veracity of results but just visit the sites 'they like the look of'. These proportions have not changed since 2009, suggesting that nearly half of 12-15 year olds who use search engine websites are not critically aware of the provenance of its content."<sup>48</sup> A teacher interviewed by Demos for this research commented that:

*It was noticeable that they [the children] would always go for whatever came up first on the [search engine] hit list, and take that as a total fact.*

(ICT Co-ordinator, Enfield)

### Critical evaluative techniques

Assessing online information for accuracy or trustworthiness depends on both classic techniques of fact-checking and new, sometimes quite specific, skills that apply these techniques to the internet.

In 2009, internet users rated the reliability and accuracy of the internet 3.6 out of 5. This compares to a 3.5 for television, a 3.5 for radio and a 2.9 for newspapers, making the internet the most trusted medium.<sup>49</sup> Providers of internet services are more trusted than the people running government, running newspapers or running major corporations.<sup>50</sup>

Digital natives are especially vulnerable to over-estimating their critical abilities (and therefore get duped) because experience and use of the internet seems to be the primary factor in shaping trust in the internet.<sup>51</sup> For digital natives, those who have grown up with the digital world, trust is high. Generally, internet users trust in their own evaluative skills: 89 per cent felt fairly or very confident in their usage.

But this confidence might be misplaced. Only 33 per cent of 9-19 year olds have been taught how to judge the reliability of online information.<sup>52</sup> In 2005, 30 per cent of 9-19 year old pupils report having received no lessons at all on using the internet.<sup>53</sup>

Many young people do not know how easily they can be manipulated, and do little to ensure that they are not. One recent survey asked what checks children aged 12-15 who use the internet at home apply before visiting a new website. Around a quarter said they made no checks at all. Only 8 per cent of 12-15 year old check who created the site and why; only 17 per cent compare information across sites; and 26 per cent ask someone else if they have been to the website.<sup>54</sup>

The 'checks' that are made can be superficial: such as whether the website looks and feels legitimate. Research has revealed information quality does not appear to be of significance to many digital natives, and that decisions about information quality is based on site design, rather than more accurate checks.<sup>55</sup>

Trust in the internet is not absolute and unreserved of course. A 2005 study showed that 38 per cent of pupils aged 9-19 trust most of the information of the internet, 49 per cent trust some of it, and only 10 per cent are skeptical about much of the information online.<sup>56</sup> One study showed that whilst people rated their confidence in the reliability of online information as 6 out of 10, only 3 per cent of respondents expressed total confidence, suggesting recognition of some of the possible biases and inaccuracies.<sup>57</sup>

Children are also able to rudimentarily discern quality of information. For example, in the 8-11 and 12-15 age groups, children are more likely to believe that documentary or news programmes are a better reflection of real life than reality TV programmes such as Big Brother.<sup>58</sup> Something similar occurs online, too. 12-15 year olds are more likely to believe that most of the information available on news sites is true (87 per cent) and sites used for homework (88 per cent), than blogs or user generated sites (48 per cent). There are no differences in belief by gender or by

socio-economic group and there has been no change in attitudes among 12-15 year olds since 2009.<sup>59</sup>

Research conducted by Futurelab suggested that teachers are increasingly complaining of ‘cut and paste syndrome’ – where students are struggling to find information online, and are simply copying chunks of information that is only vaguely relevant, and with which they have not engaged.<sup>60</sup> Aside from other issues – this is a major problem in relation to plagiarism. 55 per cent of teachers surveyed in 2008 felt their students ‘did not have sufficient understanding of what plagiarism was and what counts as legitimate research’.<sup>61</sup>

There are also suggestions that the different way we consume information on the internet militates against the criticality of deep, single-source reading. We ‘bounce’, visiting only one to three pages from the thousands that are available, propelled along by powerful search engines. We also ‘skitter’, viewing more than reading. An article is on average viewed for around five minutes, and summaries are read much more than the full content. The user moves horizontally across the internet, with frequent and light contacts rather than progressively deeper research of a single source.<sup>62</sup> This is ‘associative’ rather than ‘linear’ thinking.<sup>63</sup>

### **Evidence: diversity and variety**

It is an essential and underlying tenet of the philosophy of science that to establish a rule, we must try to prove it false. This is Karl Popper’s famous ‘falsifiability’ test.<sup>64</sup> However, people don’t always work like that. In fact, we tend to do the precise opposite.<sup>65</sup>

Numerous studies have shown that we search for evidence to prove our theories, and want to believe we have found it; that we are more aware of flaws in studies that present evidence that challenge our beliefs than those that confirm them; and that we are influenced enormously by what people around us are saying and doing.<sup>66</sup> In short, when it comes to assessing information and arriving at decisions, human beings are very rarely entirely logical, deductive and rational.



The human predilection for ‘homophily’ – the principle that similarity breeds connection – in social networks generally is well evidenced.<sup>67</sup> Social media may exacerbate the problem. One of the ways in which people manage their internet consumption is through the ‘social web’ – a selection of filtering, grading and ordering sites. There are many new programmes and filters that help people to distinguish between information of varying quality. Cass Sunstein has argued that people increasingly tailor their own consumption to match their preferences, a new form of newspaper he calls the *Daily Me*.<sup>68</sup>

The general trend toward internet personalisation means we are seeing the *World Wide Me* too. Eli Pariser’s latest work, for instance, indicates that as search engines, online retailers and social media increasingly filter according to their intimate insight of who we are and what we like, we increasingly live in our own, custom-made ‘filter bubbles’, or a ‘unique universe of information for each of us’.<sup>69</sup>

Being surrounded by gate-keepers pre-empting our decisions about the kinds of information we want to see – what Pariser calls ‘invisible auto-propaganda’ – has serious consequences. The possibility of serendipity – of fortuitously stumbling across something one didn’t expect – decreases. Google is developing a Serendipity Search Engine, although this seems to constitute Google knowing enough about our preferences to know about things that we do not know but would like to.<sup>70</sup> More seriously, and taken to extremes, not being confronted by alternative news, ideas, or viewpoints can be dangerous – leading to greater polarisation, even radicalisation, of political views.<sup>71</sup> Cass Sunstein calls this ‘group polarisation’ – where like minded-people, after discussing, confirming and validating these positions, all end up taking a position more extreme than any started with.<sup>72</sup> As people’s views find social encouragement, they become more confident holding a more extreme position. This has been evidenced through hundreds of studies.<sup>73</sup> Many caution, Sunstein included, that these processes are increasingly happening in internet forums.

However, Sunstein *et al* are not without their critics. One Pew survey showed that people who get their news online had a *more* diverse view of political issues than those who got it offline.<sup>74</sup> Matthew Gentzkow wrote a study that found that people with relatively extreme political views not only viewed more extreme sites, but also spent more time on centrist sites and even sites that diverged with their points of view: ‘There is not a lot of evidence for echo chambers – that liberals only read liberal stuff, while conservatives only read conservative stuff.’<sup>75</sup>

Using indices taken from the literature on racial segregation to measure ‘conservative exposure’ in various forms of literature, the study found ‘no evidence that the internet is becoming more segregated over time.’<sup>76</sup> Of course, this may not be relevant anyway. Sarita Yardi and Danah Boyd analysed 30,000 tweets about the shooting of George Tiller, the late-term abortion doctor. They found that, looking at the conversations among pro-life and pro-choice proponents, replies between like-minded individuals strengthen group identity, whilst replies between individuals of different positions reinforce in-group and out-group affiliation. Even when exposed to broader viewpoints and arguments, people can be limited in their ability to engage in meaningful discussion.<sup>77</sup>

**Box 1 – Case study: *Digital Disruption* and Bold Creative**

The creative design agency Bold Creative run a project called *Digital Disruption*. Worried about the escalation of public disorder as a result of online propaganda (such as the 2009 Harrow Mosque riots, where a coffee shop was trashed because it was suspected of funding the oppression of Muslims in the Middle East) the project aims to equip young people with the skills they need to critically analyse messages online. Bold Creative has developed online viral films with a group of teenagers from Mile End exploring how online films affected their peers, how influential online media was, how vulnerable young people were to this kind of manipulation and what young people need to know to protect themselves. One of the films, propagating a deliberately bogus theory of a government cover-up – ‘The Vampire Conspiracy’ became embedded into conspiracy sites and forums throughout the internet. A ‘reveal’ then showed other young people how easy it was to be fooled by this video. Bold Creative’s approach is important because it does not tell young people what to think, but tries to promote critical and independent thought through exposing and deconstructing the techniques that can be used to manipulate them.

## CHAPTER 3 - WHAT THE TEACHERS THINK

Between May 16<sup>th</sup> and June 30<sup>th</sup> 2011, Demos conducted a survey of primary and secondary school teachers in England and Wales about their views on their pupils' digital judgment, and how it might be taught in school. Through a targeted snowball sampling technique, we received 509 responses. This is the largest survey of its kind ever conducted. A full methodology is available in the annex. As we noted in the executive summary, the results should be seen as an exploration of broad trends in teachers' attitudes towards a series of trends. It is not, and should not be seen as, a perfectly representative sample of teachers.

We present the overall data below, and in places present some simple cross-tabulations to determine if particular sub-groups of our sample responded in a significantly different way to the total sample. As noted in the methodology, a post-stratification weighting was applied according to subject taught, on questions where there was a variation of twice the standard deviation (questions 4, 5a, 5c, 5d, 7a, 7d, and 9c – see the list of questions in the annex). Post-weighting percentages for these questions are given in brackets.

### Demographics

We asked teachers their most recent teaching position, the subject they taught, and what level they taught at (n=495).

The most common position held was of secondary school teacher (45 per cent), and level of seniority was head of department (27 per cent). The most common teacher subject is English (24 per cent), religious education (26 per cent) and mathematics (22 per cent). 80 percent teach at Key Stage 4, 80 per cent at Key Stage 3, and 51 per cent at A or A/S level. Smaller numbers teach at Key Stages 1 and 2, or provide vocational training and adult education.

### Internet and school

Participants were asked how important they regard internet-based research for their students' schoolwork (n=400).

	<b>Very important</b>	<b>Quite important</b>	<b>Quite unimportant</b>	<b>Very unimportant</b>	<b>Don't know</b>
<b>Total sample</b>	38.0%	50.8%	9.0%	2.0%	0.3%
	(36.6%)	(51.9%)	(9.0%)	(2.2%)	(0.2%)

Participants were asked how important they regard internet-based content to be in the formation and validation of the beliefs their students hold (n=404).

	<b>Very important</b>	<b>Quite important</b>	<b>Quite unimportant</b>	<b>Very unimportant</b>	<b>Don't know</b>
<b>Total sample</b>	22.3%	54.2%	16.1%	2.5%	5.0%

Participants were asked whether they had ever experienced a number of internet related issues in the classroom, and if so, how often. (n=422)

	<b>On a daily basis</b>	<b>On a weekly basis</b>	<b>On a monthly basis</b>	<b>Occasionally</b>	<b>Never</b>	<b>Don't know</b>
<b>Set internet based research for homework</b>	3.1%	24.3%	31.7%	35.1%	5.5%	0.2%
	(1.1%)	(25.8%)	(25.4%)	(36.7%)	(11.1%)	(0.0%)
<b>Students bring information they have discovered from the internet into class discussions</b>	5.3%	27.6%	27.1%	36.2%	3.8%	0.0%

### Level of pupils' digital fluency

We provided participants with a definition of digital fluency that was used throughout the survey. This was 'the ability to critically assess and understand different sources of online information.'<sup>78</sup>

We asked participants if they thought digital fluency, defined above was an important skill to possess (n=411).

	<b>Very important</b>	<b>Quite important</b>	<b>Quite Unimportant</b>	<b>Very unimportant</b>	<b>Don't know</b>
<b>Total sample</b>	79.8%	19.5%	0.7%	0.0%	0.0%

We asked participants if any of the following things had occurred in their classroom, and if so how frequently (n=422).

	<b>Daily basis</b>	<b>Weekly basis</b>	<b>Monthly basis</b>	<b>Occasionally</b>	<b>Never</b>	<b>Don't know</b>
<b>Encounter arguments within lessons or submitted schoolwork that contain inaccurate internet-based content you regard as being deliberately packaged by the producers to be misleading or deceitful (for example, holocaust denialism packaged to be radical historical revisionism)</b>	1.7% (1.1%)	8.9% (6.1%)	7.7% (4.0%)	41.5% (35.8%)	35.5% (47.7%)	4.8% (5.2%)
<b>Encounter arguments within lessons relating to conspiracy theories</b>	0.5% (0.5%)	7.9% (4.8%)	12.5% (7.3%)	37.8% (35.7%)	35.1% (41.5%)	5.9% (10.1%)

We asked participants to rate their pupils' digital fluency across a number of domains.

	<b>Excellent</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very poor</b>	<b>Don't know</b>
<b>Understand how search engines operate</b>	13.7% (11.6%)	35.3% (33.6%)	30.9% (32.9%)	12.9% (13.7%)	2.3% (5.1%)	3.4% (3.1%)
<b>Understand the difference in quality of information, for example between statistics and anecdotes</b>	2.2%	13.9%	37.0%	35.3%	8.7%	2.9%
<b>Apply fact-checks or other source verification on the online information they consume</b>	1.2%	7.0%	24.3%	44.8%	19.5%	3.1%
<b>Recognise bias or propaganda</b>	1.0% (0.4%)	14.0% (8.9%)	33.1% (34.8%)	38.4% (38.3%)	11.6% (14.8%)	1.9% (2.8%)
<b>Visit a wide variety of websites with different perspectives</b>	2.2%	11.1%	32.2%	36.3%	15.1%	3.1%

When average ratings are taken (1 being ‘excellent’, 5 being ‘very poor’), it is possible to rank these skills according to their level of perceived proficiency:

<b>Internet Skill</b>	<b>Average Rating</b>
Understand how search engines operate	2.57
Understand the difference in quality of information, for example between statistics and anecdotes	3.35
Recognise bias or propaganda	3.45
Visit a wide variety of websites with different perspectives	3.53
Apply fact-checks or other source verification on the online information they consume	3.77

Hence, teachers thought their students best able to understand how search engines operate, and least able to apply fact-checks or source verification. With an ‘average’ proficiency scoring a 3, teachers thought, with the exception of understanding how a search engine works, that their pupils were below average at all other skills.



### Teaching digital fluency

We asked participants whether digital fluency is taught in their schools, and whether other types of critical thinking is taught in their schools (n=416).

	Yes – a lot	Yes – a little	No	Don't know
<b>Digital fluency</b>	10.1%	59.9%	14.0%	15.9%
<b>Other critical thinking</b>	34.2%	55.5%	4.6%	5.6%

We asked participants if they thought digital fluency should be given greater prominence in the national curriculum; and if so how much more (n=412).

	Yes – a lot	Yes – a little	No – it is about right	No – there is too much already	Don't know
<b>Total sample</b>	48.8%	38.3%	11.9%	1.3%	2.4%
	(50.5%)	(37.3%)	(10.6%)	(0.5%)	(1.1%)

We asked participants if they felt confident teaching the subject themselves (n=412).

	Very confident	Quite confident	Quite unconfident	Very unconfident	Not applicable
<b>Total sample</b>	24.0%	53.6%	18.2%	3.4%	0.7%

Interestingly, when asked in what subject digital fluency might be taught, there was a remarkable array of different subjects proposed. The most popular response was (perhaps unsurprisingly) Information Technology, with 80 per cent. But a very large number of subjects also scored very highly: English (80 per cent), History (74 per cent), Citizenship (72 per cent), Religious Education (64 per cent) and Politics (62 per cent). This suggests that teachers felt that digital fluency is a core competency, one that should be taught across several subjects. As one teacher interviewed by Demos commented:

*It's quite difficult [to teach Digital Literacy] because you are dealing with something that is clearly cross-curricular. The ability to engage with the internet effectively is something that is relevant to all subjects*

Andrew Ryan, English teacher, Mellow Lane School

### Assistance needed

The final question in our survey related to the assistance that teachers thought they would need if they were to teach digital literacy in their school.

The responses were open. We coded them manually into groups. The intent is to indicatively show teachers' opinions about the best ways forward, hence, when some teachers gave more than one response, these were treated as separate responses.

	Number of Responses	Proportion of total responses
<b>Training</b>	38	35.8%
<b>Teaching resources</b>	31	29.2%
<b>Time in the curriculum</b>	18	16.9%
<b>Reference materials</b>	11	10.4%
<b>ICT infrastructure</b>	8	7.5%

Training was most popularly regarded to be necessary for digital fluency teaching. Even some experienced teachers wanted a thorough development regime:

*Even as a skilled Media Studies teacher, I feel I would want training. I think I know (more or less) how search engines work and how to get the most reliable sources [but] that's only through personal trial and error and exploration.*

Secondary School, Head of Department

There was division over whether the training could be conducted in-house (and was therefore more a question of time, for instance Inset Days allocation) or whether external supervision was required. However, there was agreement that the training should both be general and subject-specific – with both general principles of digital fluency, and also how digital fluency teaching could be integrated to their specific subject areas.

Teachers felt a range of materials would be important. These would include strategic documents – such as a digital fluency syllabus and explanation of context – and also classroom-specific material, including schemes of work, suggested approaches, worksheets, examples, and written materials on detecting bias and verification strategies. Comparisons of information and misinformation, partial and impartial websites were thought to be particularly helpful, with ‘links to resources which compare the content on a particular aspect but from different angles’ (ICT and Business Studies, Secondary School). One teacher suggested that this could be achieved through ‘resources on the internet – mock ups perhaps’ (KS2, Head of Year).

Many suggested materials and teaching aids would be most helpful if they were hosted online, and universally accessible. Some suggested all materials should be organised around ‘constructed websites that provide a context for teaching digital literacy ... in an interactive way’ (KS1/2, Deputy Head). Some suggested that the material be subject-specific, exploiting the digital fluency learning opportunities in each subject. Others thought a ‘syllabus of

nationally agreed content' (KS3/4, Deputy Head Teacher) would be more useful.

A smaller, but still significant number of teachers thought that time in an otherwise already crowded curriculum was the only barrier:

*If written into the curriculum I could easily put aside a lesson for discussing digital literacy and how to effectively use the internet for research*

Secondary school, Design & Technology teacher

Many suggested that digital fluency should have a strategic, 'whole of school' implementation – with learning opportunities sought in each subject: 'Digital literacy needs to be embedded in all areas of the curriculum by teachers and senior managers!' (Geography, ICT and PE, Deputy Head).

As a Head of Department commented:

*Teachers [need] to recognise the importance of digital literacy and apply it to their subject and not think it's the job of the IT department or English!*

Finally, a disturbing minority of teachers reported a lack of basic ICT infrastructure, or access to computers/laptops on a regular basis, with appropriate software and reliable internet access. Other organisations, notably the E-learning Foundation, have pointed to the 'Digital Divide' – a lack of access to computers and the internet – as a pernicious and important kind of inequality.<sup>79</sup> Obviously, no amount of digital fluency teaching can help students leverage the internet as a learning aid if they cannot access it.

## ANNEX - METHODOLOGY

### Survey Design

Prior to the administration of the survey, the questions were stress-tested by the research team for relevance to the existing literature on digital literacy. The prototype survey was then piloted on a small number of teachers, to test for transparency of research purpose, clarity of questioning, and ease of answering. Changes were made according to teacher feedback, and approved by the research leader. The final survey contained 14 questions (with 3 divided into sub-questions) organised around the broad themes of demographics/role of the teacher, importance of the internet, extent of evidence of lack of digital fluency and possible steps forward. The questionnaire is included in full at the end of this paper.

### Survey Sampling

The survey was an internet survey, hosted by *Survey Monkey* ([www.surveymonkey.com](http://www.surveymonkey.com)), which allows respondents to complete the survey online (available at: <https://www.surveymonkey.com/s/5FJKXD5>).

Internet-based surveys are limited by coverage and sampling difficulties. It is noted, however, that the most significant limitation in this respect occurs when internet surveys are used for general population surveys.<sup>80</sup> This is mainly because of the variation in internet coverage – and ease using the internet – differs according to demographic indicators, even in countries with high overall penetration levels.

However, internet surveys are considered more appropriate for targeted populations, such as professional groups, where internet penetration is high (probably higher than landline telephone access). Although there are no national statistics on the number of teachers with internet access, the 2011 ONS survey shows that around 90 per cent of those of working age do use the internet.<sup>81</sup>

Because there is no population sample frame (e.g. e-mail addresses for every teacher) that would allow for a random sample, we decided to use a ‘snowballing’ sampling technique. This strategy entails targeting a wide sample of school location, school type, teacher subject area, teacher age group and type of school, without aiming for a perfect representation of the national cohort of teachers. We then requested that those who complete the survey pass it on to colleagues to do likewise.

We identified and recruited a number of individuals and schools spread across geographical regions, subject areas, age groups and types of school. These individuals would then publicise the survey through their own professional networks. It was understood that the extent of local penetration would differ. In some places a larger professional network could be leveraged – resulting in high numbers of teachers filling out the survey. In others the professional network would be smaller, and the local distribution of the survey smaller. The survey dissemination took a number of specific forms, with the aim of our starting point being varied and broadly representative of the overall teaching profession:

- *Internet promotion:* we approached a number of organisations to include advertisements on their websites. This occurred on the Institute for Ideas teachers forum, Bold Creative’s website, the Demos website, the Nominet Trust’s website and the E-learning Foundation’s website.
- *Targeted adverts through Teach First networks:* regional Teach First networks conduct circular communications to all members in their area. We received confirmed that the survey was publicised in a North-West London mail-out, a Liverpool area mail-out and a South-East region mail-out.
- *Social Media promotion:* we approached a number of high-visibility groups and individuals to publicise the survey through their social media presence. A number of these groups and individuals did this through their Facebook pages and Twitter accounts.
- *Direct Recruitment:* we placed emphasis on as diverse a direct recruitment effort as possible, ranging from first year teachers, Heads of Departments, Principals and Supply Teachers, and to as many Departments as possible, including ICT, Humanities,

Science, PE and Art. We had confirmed successful distributions throughout the school for five Birmingham inner-city secondary state schools, seven London inner-city secondary schools, four state secondary schools in Outer London, four London private schools, one Cambridgeshire state secondary school, one Leeds state secondary school, one Exeter secondary state school, one Liverpool secondary state school, eight Birmingham state primary schools, two Manchester state primary schools, and three Cambridgeshire state primary schools.

- *Mailshots*: we approached organisations to request that the survey was included in mass emails to all teachers on their mailing lists. This was successfully done to the Heads of Religious Studies and Philosophy at all English sixth form schools and Further Education Colleges [n=2800].

It is important to note the weaknesses in this type of sampling technique. Although the starting points were intentionally varied, it is not possible to ascertain the full distribution of the survey beyond the first point of contact. Research into internet sampling shows that where unique URLs are provided for each possible participant this allows greater monitoring of who responds. Due to resource constraints, we were not in a position to do this. Similarly, it has been established that non-response rate can be improved through mail follow up, although this was not possible as the sampling technique used did not allow for the identification of individual participants.<sup>82</sup>

Given the inevitable introduction of skewed distributions and statistical asymmetries due to the use of targeted snowballing, we undertook some post-data weighting in order to make the sample *more* representative of the teaching profession overall. However, due to the limitations stated above we cannot claim with confidence that the sample is broadly representative. We considered that the sampling method would result in a number of biases.

### Geographical bias

Although we aimed for (and achieved) a wide geographic spread of survey distribution, we judged that a sample perfectly representative of UK geography would not be necessary. Based on our literature review, and an assessment of national demographics, there was nothing to indicate that teacher attitudes and region

would be bi-variates. While a small literature does indicate that relevant socio-geographic inequalities do exist (such as access to ICT), our survey would only be able to gather data by broad region, and not with a granularity that would allow us to meaningfully relate it to this literature.<sup>83</sup>

### Teacher subject bias

One of the major concerns was that certain teachers – either through chance or inherent bias in the starting point in our sampling – would be overrepresented in our sample. In order to make our sample more representative of the national cohort of teachers across these characteristics, we conducted a post-collection weighting of the data, where the data showed significant bias.

To calculate whether there was significant variation in the data set according to subject taught, we conducted a test to calculate the standard deviation from the norm, according to each teacher subject response.

Jelke Bethlehem, a leading expert on online sampling techniques, has suggested that reliability can be increased by post-stratification data weighting against offline demographics. In short, this means that if in our sample a certain teacher type is over-represented, this is corrected in the final percentages.<sup>84</sup> We therefore collected baseline data of the teaching profession in England and Wales, and re-weighting the data to correct variation. This was available from the School Workforce Census.<sup>85</sup>

The proportions of teachers by-subject of the whole teacher workforce, given in the School Workforce Census, and on which the weightings are based, are:



<b>Subject</b>	<b>Proportion of subject to entire teacher workforce</b>
English	15.2%
Mathematics	13.7%
Science	13.9%
Citizenship	4.7%
Religious Education	6.5%
Art and Design	5.1%
Geography	5.6%
History	6.3%
ICT	7.7%
Modern Languages	12.6%

In those questions where there were responses greater than twice the standard deviation – which suggests outliers –we conducted a post-stratification weighting. The following questions required re-weighting: Q4 (SD=0.105); Q.5a (SD=0.141); Q5c (SD=0.21); Q5d (SD=0.336); Q7a (SD=0.116); Q7d (SD=0.132); and Q9c (SD=0.08). The percentages shown in the paper are post-weighted.

### **Self-selection and non-response rate bias**

Internet surveys have both strengths and weaknesses in respect of self-selection and response/non-response bias. The main concern is that, because the survey is optional, only people who are interested in the subject, or comfortable with internet surveys, are likely to complete it (for example, teachers who taught ICT). All surveys where the respondents self-select, as opposed to recruited panel surveys, suffer from this potential bias. In order to minimise the risk of teachers self-selecting, we divulged very limited information about the survey before asking teachers to complete it. Internet

surveys are also known to have very low response rate – usually between 30 and 40 per cent (around six to ten per cent lower than other survey modes), but with a very high standard deviation, suggesting response rate is highly variable.<sup>86</sup> Although this can be improved through the use of incentives, none were used in this survey. Because we do not know the total number of views that this survey had, we do not know the total response rate. This means we are not able to correct for non-response rate. 580 people started the survey, and 509 agreed to the consent page. 412 finished every question.

It is with these caveats in mind that we present this data, and the results should be seen as an exploration of trends that set out some general themes that teachers are concerned about. It is not, and should not be seen as, a perfectly representative sample of teachers.

### Data Analysis

Data were analysed through the Survey Monkey site, which has a number of tools that allows for both filtering and cross tabulation. Because the survey is indicative and explorative, we provide only baseline vital statistics to each question asked.

To aid the comparison of answers from different selected cohorts within our sample, we sometimes present the results as a question ‘rating’. Each possible response was assigned a corresponding numeric value, with higher frequency responses receiving lower assigned values. For example: ‘Daily basis’ = 1; ‘Weekly basis’ = 2; ‘Monthly basis’ = 3; ‘Occasionally’ = 4; ‘Never’ = 5. The ‘rating’ of each question is calculated by dividing the total added value of each respondent by the number of respondents. This tells us the averaged response for this question. A rating of 1, for example, would mean every respondent answered ‘daily basis’, whilst a rating of 5 meant every respondent answered ‘never’. We removed those who answered ‘don’t know’ in order to avoid distorting the process of averaging.

### Other considerations

As this research focused on individuals over the age of 16, no CRB check was necessary; consequently, none was sought. Similarly, informed consent was not required from participant's parents/guardians as SRA ethics guidelines suggest such clearance should not be sought and is not required when investigating participants aged over 16. Individual informed consent was sought and gained from all participants themselves, and was signified via agreement to a consent statement presented at the start of the survey – failure to signify acceptance of this statement prevented further participation in the research.

Participants were not fully briefed on the study's aims before completing the survey in order to avoid the exhibition of demand characteristics. Only a broad overview of the research was provided at the start of the survey, with more detailed information on the research aims provided only after the last question was been completed. The contact details of the lead researcher were provided to all participants to cover the eventuality that they had questions not covered by the debrief notes. Few participants availed themselves of this option.

All participants were made aware of their right to withdraw from the research at any time prior to completion as part of a preface statement presented on the first page of the survey. Participants were further reminded of this right upon completion of the survey via a paragraph in the debrief notes, with their intention to withdraw capable of being signified via a check box. No participants did this.

Ethical and legal considerations relevant to the storage and handling of data were also observed; all data were kept digitally encoded, and were destroyed on completion of the research in compliance with the Data Protection Act. No data capable of identifying any participants were collected, and the data were not shared with any third parties external to the research project.

## Full list of survey questions

1. What is your current position, or if retired, most recent position?
2. What subjects are you/were you teaching?
3. What age group/key stage group are you/were you teaching?
4. How important do you regard internet-based research for your students' schoolwork?
5. How often does the following occur?
  - a. Set internet-based research for homework; Students bring information they have discovered from the internet into class discussions; Encounter arguments within lessons or submitted schoolwork that contain inaccurate internet-based content you regard as being deliberately packaged by the producers to be misleading or deceitful (for example, holocaust denialism packaged to be radical historical revisionism);
  - b. Encounter arguments within lessons relating to conspiracy theories.
6. How important do you regard internet-based content to be in the formation and validation of the beliefs your students hold?
7. We refer to 'digital literacy' as the ability to critically assess and understand different sources of online information. This has several components. As best you can, please rate your students' ability in the following competencies with reference to online material:
  - a. Understand how search engines operate;
  - b. Understand the difference in quality of information, for example between statistics and anecdotes;
  - c. Apply fact-checks or other source verification on the online information they consume;
  - d. Recognise bias or propaganda;
  - e. Visit a variety of sources offering different perspectives.
8. Keeping that definition of digital literacy in mind, please answer the following: do you consider digital literacy to be an important skill for young people to possess?
9. Keeping that definition of digital literacy in mind, please answer the following:
  - a. Is digital literacy taught in your school?
  - b. Are other types of critical thinking taught in your school?
  - c. Do you think that digital literacy should be given greater prominence within the national curriculum?
  
  - d. Would you feel confident teaching your students about

digital literacy?

10. What subject(s) should teach digital literacy (tick as many as you'd like)?
11. What support would you need in teaching digital literacy?

## BIBLIOGRAPHY

Bartlett, Jamie and Miller, Carl, *The Power of Unreason* (Demos: 2010)

Baum, M.A, and Groeling, T, 'New Media and the Polarization of American Political Discourse', *Political Communication* 25 no. 4(2008).

Bell, Vaughan, 'Don't touch that dial! A history of media technology scares, from the printing press to Facebook', *Slate* 15 Feb 2010, <http://www.slate.com/id/2244198>

Berners-Lee, Tim 'Long Live the Web: A Call for Continued Open Standards and Neutrality', *Scientific American*, 22 November 2010, <http://www.scientificamerican.com/article.cfm?id=long-live-the-web&print=yes>

Blank, Grant, 'Trust on the internet now exceeds trust in other major institutions', *Oxford Internet Surveys*. <http://microsites.oii.ox.ac.uk/oxis/blog/2010/trust-internet-now-exceeds-trust-other-major-institutions>

Bosker, Bianca, 'As Internet Use Grows, Is it Polarizing Political Views?', *Huffington Post*, 29 Mar 2011 [www.huffingtonpost.com/2011/03/29/internet-polarizing-politics\\_n\\_842263.html](http://www.huffingtonpost.com/2011/03/29/internet-polarizing-politics_n_842263.html)

Boulton, Clint, 'Google Serendipitous Search Plans Helmed by Marissa Mayer', *eWeek*, 17 Oct 2010, [www.eweek.com/c/a/Search-Engines/Google-Serendipitous-Search-Plans-Helmed-by-Marissa-Mayer-513716](http://www.eweek.com/c/a/Search-Engines/Google-Serendipitous-Search-Plans-Helmed-by-Marissa-Mayer-513716)

Brown, Robert, *Social Psychology: Second Edition* (2003)

Bunz, Ulla, A Generational Comparison of Gender, Computer Anxiety and Computer-Email-Web Fluency, *Studies in Media and Information Literacy Education*, vol. 9, No. 2 (May 2009), 54-69.

Byron, Tanya, 'Safer Children in a Digital World: The Report of the Byron Review', *Byron Review: Children and New Technology* (2008).

Catone, Josh, 'Infographic: The State of the Internet: Summing up 2010', *Mashable* Jan 25 2011, <http://mashable.com/2011/01/25/internet-size-infographic>

Clark, Andy, *Supersizing the Mind: Embodiment, Action and Cognitive Extension* (Oxford University Press 2008)

Cyberspace Research Unit (2004). Emerging Trends amongst Primary School Children's use of the Internet. Full Report. [http://www.uclan.ac.uk/host/cru/docs/emerging\\_trends\\_full\\_report\\_060204.pdf](http://www.uclan.ac.uk/host/cru/docs/emerging_trends_full_report_060204.pdf)

Das, M., Ester, P & Kaczmirek, L, 'Social and Behavioural Research and the Internet', *European Association of Methodology* (2011)

Dutton, W. and Shepherd, A. (2006) 'Trust in the Internet as an Experience Technology'. *Information, Communication & Society* 9(4) 433–451.

Dutton, W., Helsper, EJ and Gerber, MM, (2009) *Oxford Internet Surveys*, 'The Internet in Britain 2009'

Economist, 'Too much Information: How to Cope with Data Overload', 30 June 2011, <http://www.economist.com/node/18895468>

Ellen J. Helsper, *Oxford Internet Surveys*, 'Trust and the Internet: Experience technology or certainty through models?', European Communication Conference – Barcelona, 26 November 2008

Emery, Daniel, 'The Rise of Hate 2.0', BBC News, 22 Jun 2009, <http://news.bbc.co.uk/1/hi/technology/8097979.stm>

Fitzgerald, Mary, 'Critical Thinking: Tools for Internet Information Evaluation', Conference Paper presented at the Annual Conference of The International Association of School Librarianship, 1997, <http://www.eric.ed.gov:80/PDFS/ED412944.pdf>

Foss, B (ed), *New Horizons In Psychology*, Harmondsworth: Penguin, 1966.

Greenfield, S, 'Is the web changing our brains?', BBC News, 11 September 2009

Gluckman, D, 'The Virtual Revolution – Homo Interneticus?', BBC, 19 Feb 2010, [www.bbc.co.uk/blogs/digitalrevolution](http://www.bbc.co.uk/blogs/digitalrevolution).

Gentzkow, M, and Shapiro, JM, 'Ideological Segregation Online and Offline', *University Chicago Booth School of Business*, (March 2011) [http://faculty.chicagobooth.edu/matthew.gentzkow/research/echo\\_chambers.pdf](http://faculty.chicagobooth.edu/matthew.gentzkow/research/echo_chambers.pdf).

Giles, J, 'Internet Encyclopaedias go head to head', *Nature* 438, p 900-901, 15 December 2005

Hardwig, J, 'The Role of Trust in Knowledge', *Journal of Philosophy* 88 no. 22, 1991

Horrigan, J, Garrett, K and Resnick, P, 'The Internet and Democratic Debate', *Pew Internet* Oct 27, 2004

Joinson, A, McKenna, K, Postmes, T, and Reips, U-D (eds), *Oxford Handbook of Internet Psychology*, Oxford: Oxford University Press, 2007

Levine, P, 'The Problem of Online Misinformation and the Role of Schools', *Studies in Media and Information Literacy Education* Vol. 5, No. 1 (February 2005), p 1-11.

Livingstone, S and Bober, M 'UK Children Go Online: Final Report of Key Project Findings', *London School of Economics and Political Science* (April 2005) [http://www.lse.ac.uk/collections/children-go-online/UKCGO\\_Final\\_report.pdf](http://www.lse.ac.uk/collections/children-go-online/UKCGO_Final_report.pdf)

Logan, Robert K, *The Sixth Language: Learning a Living in the Internet Age* (Stoddart Pub, 2008).



McPherson, M, Smith-Lovin, L and Cook, J, 'Birds of a Feather: Homophily in Social Networks', *Annual Review of Sociology* 27 (Volume publication date August 2001).

Nicholas, D, 'Digital Information Consumers, with special reference to the Google Generation', *University College London CIBER Project*, <http://www.ucl.ac.uk/infostudies/research/ciber/DNinduction.pdf>

Nicolas, David, 'Information Behavior of the Researcher of the Future', *University College London CIBER Project*, 11 January 2008, [http://www.jisc.ac.uk/media/documents/programmes/reppres/gg\\_final\\_keynote\\_11012008.pdf](http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf)

Nickerson, E, 'From Books to the Web: A Comparative Analysis of Holocaust Denial in the Internet Age', *University of Connecticut Honors Scholars Theses*

Ofcom, 'UK Children's Media Literacy', April 2011, <http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/media-lit11/childrens.pdf>.

Oxford Internet Institute Primary School Children's Use of the Internet (UK)

Palfrey, J and Gasser, U, *Born Digital: Understanding the First Generation of Digital Natives* (Basic Books, 2009)

Pariser, E, *The Filter Bubble: What the Internet is Hiding from You* (Penguin, 2011)

Plato, *Phaedrus*, tr Jowett, B, Project Gutenberg, 30 October 2008, [http://www.gutenberg.org/files/1636/1636-h/1636-h.htm#2H\\_4\\_0002](http://www.gutenberg.org/files/1636/1636-h/1636-h.htm#2H_4_0002)

Popper, K, *The Logic of Scientific Discovery*, New York: Basic Books, 1959.

Prensky, M, 'Digital Natives, Digital Immigrants Part 1', *On the Horizon* 9, no 5 (October 2001a)

SAFT (2003). 'What do SAFT kids do online?' (Northern Europe)

Shirky, Clay, *Cognitive Surplus: Creativity and Generosity in a Connected Age* (Allen Lane, 2010)

Smith, Aaron, *Pew Internet*, 'The Internet and Campaign 2010', <http://www.pewinternet.org/Reports/2011/The-Internet-and-Campaign-2010/Section-2/The-internet-and-political-news-sources.aspx>

Sunstein, Cass, *Republic.com*, Princeton, N.J.: Princeton University Press, 2002

Sunstein, Cass, 'To become an extremist, hang around with people you agree with', *Spectator*, July 2009, [www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.shtml](http://www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.shtml)

Sutherland, Stuart, *Irrationality* (London: Pinter and Martin, 2007)

Tang, John. et al, 'Reflecting on the DARPA Red Balloon Challenge', *Communications of the ACM* 54, no 4 (April 2011)

Vedder, Anton and Wachbroit, Robert 'The reliability of information on the internet: some distinctions', *Ethics and Information Technology*, 5 (2004)

Wintour, Patrick, 'Facebook and Bebo risk 'infantilising the human mind'', *Guardian*, Feb 24 2009, [www.guardian.co.uk/uk/2009/feb/24/social-networking-site-changing-childrens-brains](http://www.guardian.co.uk/uk/2009/feb/24/social-networking-site-changing-childrens-brains)

Yardi, Sarita and Boyd, Danah, 'Dynamic Debates: An Analysis of Group Polarization Over Time', *Bulletin of Science Technology & Society* 30 (2010)

Zuckerman, Ethan, 'Listening to Global Voices', *TEDGlobal 2010*, July 2010. [www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world](http://www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world).

Zuckerman, Ethan, 'The Partisan Internet and the Wider World', 24 May 2010, [www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world](http://www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world).

## Demos – Licence to Publish

The work (as defined below) is provided under the terms of this licence ('licence'). The work is protected by copyright and/or other applicable law. Any use of the work other than as authorized under this licence is prohibited. By exercising any rights to the work provided here, you accept and agree to be bound by the terms of this licence. Demos grants you the rights contained here in consideration of your acceptance of such terms and conditions.

### 1 Definitions

- a 'Collective Work' means a work, such as a periodical issue, anthology or encyclopedia, in which the Work in its entirety in unmodified form, along with a number of other contributions, constituting separate and independent works in themselves, are assembled into a collective whole. A work that constitutes a Collective Work will not be considered a Derivative Work (as defined below) for the purposes of this Licence.
- b 'Derivative Work' means a work based upon the Work or upon the Work and other pre-existing works, such as a musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which the Work may be recast, transformed, or adapted, except that a work that constitutes a Collective Work or a translation from English into another language will not be considered a Derivative Work for the purpose of this Licence.
- c 'Licensor' means the individual or entity that offers the Work under the terms of this Licence.
- d 'Original Author' means the individual or entity who created the Work.
- e 'Work' means the copyrightable work of authorship offered under the terms of this Licence.
- f 'You' means an individual or entity exercising rights under this Licence who has not previously violated the terms of this Licence with respect to the Work, or who has received express permission from Demos to exercise rights under this Licence despite a previous violation.

### 2 Fair Use Rights

Nothing in this licence is intended to reduce, limit, or restrict any rights arising from fair use, first sale or other limitations on the exclusive rights of the copyright owner under copyright law or other applicable laws.

### 3 Licence Grant

Subject to the terms and conditions of this Licence, Licensor hereby grants You a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) licence to exercise the rights in the Work as stated below:

- a to reproduce the Work, to incorporate the Work into one or more Collective Works, and to reproduce the Work as incorporated in the Collective Works;
- b to distribute copies or phonorecords of, display publicly, perform publicly, and perform publicly by means of a digital audio transmission the Work including as incorporated in Collective Works; The above rights may be exercised in all media and formats whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats. All rights not expressly granted by Licensor are hereby reserved.

### 4 Restrictions

The licence granted in Section 3 above is expressly made subject to and limited by the following restrictions:

- a You may distribute, publicly display, publicly perform, or publicly digitally perform the Work only under the terms of this Licence, and You must include a copy of, or the Uniform Resource Identifier for, this Licence with every copy or phonorecord of the Work You distribute, publicly display, publicly perform, or publicly digitally perform. You may not offer or impose any terms on the Work that alter or restrict the terms of this Licence or the recipients' exercise of the rights granted hereunder. You may not sublicense the Work. You must keep intact all notices that refer to this Licence and to the disclaimer of warranties. You may not distribute, publicly display, publicly perform, or publicly digitally perform the Work with any technological measures that control access or use of the Work in a manner inconsistent with the terms of this Licence Agreement. The above applies to the Work as incorporated in a Collective Work, but this does not require the Collective Work apart from the Work itself to be made subject to the terms of this Licence. If You create a Collective Work, upon notice from any Licensor You must, to the extent practicable, remove from the Collective Work any reference to such Licensor or the Original Author, as requested.
- b You may not exercise any of the rights granted to You in Section 3 above in any manner that is primarily intended for or directed toward commercial advantage or private monetary compensation. The exchange of the Work for other copyrighted works by means of digital filesharing or otherwise shall not be considered to be intended for or directed toward commercial advantage or private monetary compensation, provided there is no payment of any monetary compensation in connection with the exchange of copyrighted works.

C If you distribute, publicly display, publicly perform, or publicly digitally perform the Work or any Collective Works, You must keep intact all copyright notices for the Work and give the Original Author credit reasonable to the medium or means You are utilizing by conveying the name (or pseudonym if applicable) of the Original Author if supplied; the title of the Work if supplied. Such credit may be implemented in any reasonable manner; provided, however, that in the case of a Collective Work, at a minimum such credit will appear where any other comparable authorship credit appears and in a manner at least as prominent as such other comparable authorship credit.

#### **5 Representations, Warranties and Disclaimer**

A By offering the Work for public release under this Licence, Licensor represents and warrants that, to the best of Licensor's knowledge after reasonable inquiry:

- i Licensor has secured all rights in the Work necessary to grant the licence rights hereunder and to permit the lawful exercise of the rights granted hereunder without You having any obligation to pay any royalties, compulsory licence fees, residuals or any other payments;
- ii The Work does not infringe the copyright, trademark, publicity rights, common law rights or any other right of any third party or constitute defamation, invasion of privacy or other tortious injury to any third party.

B except as expressly stated in this licence or otherwise agreed in writing or required by applicable law, the work is licenced on an 'as is' basis, without warranties of any kind, either express or implied including, without limitation, any warranties regarding the contents or accuracy of the work.

#### **6 Limitation on Liability**

Except to the extent required by applicable law, and except for damages arising from liability to a third party resulting from breach of the warranties in section 5, in no event will licensor be liable to you on any legal theory for any special, incidental, consequential, punitive or exemplary damages arising out of this licence or the use of the work, even if licensor has been advised of the possibility of such damages.

#### **7 Termination**

A This Licence and the rights granted hereunder will terminate automatically upon any breach by You of the terms of this Licence. Individuals or entities who have received Collective Works from You under this Licence, however, will not have their licences terminated provided such individuals or entities remain in full compliance with those licences. Sections 1, 2, 5, 6, 7, and 8 will survive any termination of this Licence.

B Subject to the above terms and conditions, the licence granted here is perpetual (for the duration of the applicable copyright in the Work). Notwithstanding the above, Licensor reserves the right to release the Work under different licence terms or to stop distributing the Work at any time; provided, however that any such election will not serve to withdraw this Licence (or any other licence that has been, or is required to be, granted under the terms of this Licence), and this Licence will continue in full force and effect unless terminated as stated above.

#### **8 Miscellaneous**

A Each time You distribute or publicly digitally perform the Work or a Collective Work, Demos offers to the recipient a licence to the Work on the same terms and conditions as the licence granted to You under this Licence.

B If any provision of this Licence is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this Licence, and without further action by the parties to this agreement, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable.

C No term or provision of this Licence shall be deemed waived and no breach consented to unless such waiver or consent shall be in writing and signed by the party to be charged with such waiver or consent.

D This Licence constitutes the entire agreement between the parties with respect to the Work licensed here. There are no understandings, agreements or representations with respect to the Work not specified here. Licensor shall not be bound by any additional provisions that may appear in any communication from You. This Licence may not be modified without the mutual written agreement of Demos and You.

## NOTES

- <sup>1</sup> J Bartlett, C Miller, *Power of Unreason*, 2010, Demos: London
- <sup>2</sup> This is a weighted value. Un-weighted, the figure was 59.8 per cent. See the annex for more information.
- <sup>3</sup> This is a weighted value. Un-weighted, the figure was 56 per cent. See the annex for more information.
- <sup>4</sup> This is a weighted value. Un-weighted, the figure was 85 per cent. See the annex for more information.
- <sup>5</sup> Futurelab, *Digital Literacy in Practice*, 2010, p 34
- <sup>6</sup> Futurelab, *Digital Literacy in Practice*, 2010, p 53
- <sup>7</sup> Futurelab, *Digital Literacy in Practice*, 2010, p 11
- <sup>8</sup> OfCom, 'UK Children's Media Literacy' (April 2011) p 4,  
<http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/media-lit11/childrens.pdf>
- <sup>9</sup> Plato, *Phaedrus*, tr B Jowett (Project Gutenberg, 30 October 2008),  
[http://www.gutenberg.org/files/1636/1636-h/1636-h.htm#2H\\_4\\_0002](http://www.gutenberg.org/files/1636/1636-h/1636-h.htm#2H_4_0002)
- <sup>10</sup> V Bell, 'Don't touch that dial! A history of media technology scares, from the printing press to Facebook', *Slate* 15 Feb 2010, <http://www.slate.com/id/2244198>
- <sup>11</sup> For instance, C Shirky, *Cognitive Surplus: Creativity and Generosity in a Connected Age* (Allen Lane, 2010); A Clark *Supersizing the Mind: Embodiment, Action and Cognitive Extension* (Oxford University Press 2008); RK Logan *The Sixth Language: Learning a Living in the Internet Age* (Stoddart Pub, 2008)
- <sup>12</sup> For 'Techno-stress', see William Powers in *Hamlet's Blackberry*. The other terms are respectively attributable to William van Winkle, David Lewis, Eric Schmidt and Leslie Perlow. See 'Schumpeter', 'Too much Information: How to Cope with Data Overload', *Economist*, June 30<sup>th</sup> 2011, <http://www.economist.com/node/18895468>
- <sup>13</sup> S Greenfield, 'Facebook and Bebo risk "infantilising the human mind"', *Guardian*, Feb 24 2009, [www.guardian.co.uk/uk/2009/feb/24/social-networking-site-changing-childrens-brains](http://www.guardian.co.uk/uk/2009/feb/24/social-networking-site-changing-childrens-brains); S Greenfield, 'Is the web changing our brains?', *BBC News*, Sep 11 2009, [www.bbc.co.uk/blogs/digitalrevolution/2009/09/susan-greenfield-is-the-web-ch.shtml](http://www.bbc.co.uk/blogs/digitalrevolution/2009/09/susan-greenfield-is-the-web-ch.shtml)
- <sup>14</sup> D Gluckman, 'The Virtual Revolution – Homo Interneticus?', *BBC*, 19 Feb 2010, [www.bbc.co.uk/blogs/digitalrevolution](http://www.bbc.co.uk/blogs/digitalrevolution)
- <sup>15</sup> T Byron, 'Safer Children in a Digital World: The Report of the Byron Review', *Byron Review: Children and New Technology* (2008)
- <sup>16</sup> For a map of the balloon locations, see [http://upload.wikimedia.org/wikipedia/en/a/ao/DARPA\\_BalloonMap.jpg](http://upload.wikimedia.org/wikipedia/en/a/ao/DARPA_BalloonMap.jpg)
- <sup>17</sup> JC Tang et al, 'Reflecting on the DARPA Red Balloon Challenge', *Communications of the ACM* 54, no 4 (April 2011), <http://delivery.acm.org/10.1145/1930000/1924441/p78-tang.pdf?key1=1924441&key2=5887735031&coll=DL&dl=ACM&ip=86.2.133.253&CFID=23009868&CFTOKEN=56104470>
- <sup>18</sup> For an example of a faked photograph, see <http://twitpic.com/s9kun>
- <sup>19</sup> WH Dutton, EJ Helsper, MM Gerber, *Oxford Internet Surveys*, 'The Internet In Britain 2009', 2009, p 19 and 35
- <sup>20</sup> Ibid.
- <sup>21</sup> Office for National Statistics, 'Internet Access 2010: Households and Individuals', 2010 <http://www.ons.gov.uk/ons/rel/rdit2/internet-access---households-and-individuals/historical-internet-access/internet-access-2010-households-and-individuals.pdf>
- <sup>22</sup> A Smith, *Pew Internet*, 'The Internet and Campaign 2010', <http://www.pewinternet.org/Reports/2011/The-Internet-and-Campaign-2010/Section-2/The-internet-and-political-news-sources.aspx>
- <sup>23</sup> J Catone, 'Infographic: The State of the Internet: Summing up 2010', *Mashable*, 2011, <http://mashable.com/2011/01/25/internet-size-infographic>
- <sup>24</sup> Cited in *Digital Natives*
- <sup>25</sup> Catone, 'Infographic: The State of the Internet'

- <sup>26</sup> D Emery, 'The Rise of Hate 2.0', *BBC News* 22 Jun 2009, <http://news.bbc.co.uk/1/hi/technology/8097979.stm>
- <sup>27</sup> J Giles, 'Internet Encyclopaedias go head to head', *Nature* 438, 2005, pp 900-901
- <sup>28</sup> In a landmark legal case, a UK council forced Twitter to unmask the identity of an illegal blogger. See *Channel 4 News*, 29 May 2011, <http://www.channel4.com/news/council-goes-to-us-to-force-twitter-to-unmask-mr-monkey>
- <sup>29</sup> J Hardwig, 'The Role of Trust in Knowledge', *Journal of Philosophy* 88 no. 22 (1991).
- <sup>30</sup> A Vedder and R Wachbroit 'The reliability of information on the internet: some distinctions', *Ethics and Information Technology*, 5 (2004) p 211-215
- <sup>31</sup> OfCom, 'UK Children's Media Literacy', 2011, p 59
- <sup>32</sup> S Livingstone and M Bober, 'UK Children Go Online: Final Report of Key Project Findings', *London School of Economics and Political Science* p 14 (April 2005), [www.lse.ac.uk/collections/children-go-online/UKCGO\\_Final\\_report.pdf](http://www.lse.ac.uk/collections/children-go-online/UKCGO_Final_report.pdf)
- <sup>33</sup> Ibid
- <sup>34</sup> *BroadbandGenie*, 05 Feb 2010, 'TalkTalk Survey Reveals Inappropriate Web Use by Children' [www.broadbandgenie.co.uk/news/talk-talk-survey-reveals--inappropriate-web-use-by-children](http://www.broadbandgenie.co.uk/news/talk-talk-survey-reveals--inappropriate-web-use-by-children) (accessed June 2011)
- <sup>35</sup> M Prensky, 'Digital Natives, Digital Immigrants Part 1', *On the Horizon* 9, no 5 (October 2001a) p 1-6 (This journal was published by MCB University Press, now Emerald)
- <sup>36</sup> See Mark Robert's exhaustive minute-by-minute debunking of the film 'The Loose Change' [www.loosechangeguide.com/LooseChangeGuide.html](http://www.loosechangeguide.com/LooseChangeGuide.html)
- <sup>37</sup> *Guardian*, 'News of the World pays footballer £70,000 for libel', 2011, <http://www.guardian.co.uk/media/greenslade/2011/jun/19/news-of-the-world-medialaw>
- <sup>38</sup> E Nickerson, 'From Books to the Web: A Comparative Analysis of Holocaust Denial in the Internet Age', *University of Connecticut Honors Scholars Theses* [http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1152&context=srhonors\\_theses](http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1152&context=srhonors_theses)
- <sup>39</sup> E Zuckerman, 'Listening to Global Voices', *TEDGlobal 2010*, July 2010, [www.ted.com/talks/ethan\\_zuckerman.html](http://www.ted.com/talks/ethan_zuckerman.html)
- <sup>40</sup> E Zuckerman, 'The Partisan Internet and the Wider World', 24 May 2010, [www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world](http://www.ethanzuckerman.com/blog/2010/05/24/the-partisan-internet-and-the-wider-world)
- <sup>41</sup> MA Baum and T Groeling, 'New Media and the Polarization of American Political Discourse', *Political Communication* 25, no. 4, p 347 (2008)
- <sup>42</sup> T Byron, 'Safer Children in a Digital World: The Report of the Byron Review', *Byron Review: Children and New Technology* (2008)
- <sup>43</sup> Futurelab (2010) *Digital Literacy in Practice*
- <sup>44</sup> Futurelab (2010) *Digital Literacy in Practice*, p 19
- <sup>45</sup> This definition draws on a useful distinction drawn between computer literacy and information literacy by the Joint Information Systems Committee. They referred to computer literacy as the ability to use certain applications and software; information literacy the ability to develop good search strategies for finding quality information and evaluate it. The latter is digital literacy, and it relates, ultimately to one's ability to exercise sound judgment.
- <sup>46</sup> For example, [www.snopes.com](http://www.snopes.com). In a crowdsourcing effort, people can enter the information they have heard online, and members of the Snopes community research the claim. Of course, it is possible that this site contains disinformation too, but the site fully publishes all the research material used to investigate each claim that people can check for themselves: 'Checking controversial or extravagant against other sources, including debunking websites, should become second nature – as habitual as shredding your bills'
- <sup>47</sup> You can compare the different search returns of different engines from the same query at <http://www.thumbshots.com/Products/ThumbshotsImages/Ranking.aspx>
- <sup>48</sup> OfCom, 'UK Children's Media Literacy', p 47
- <sup>49</sup> Dutton, Helsper and Gerber, 'The Internet in Britain', p 31



- <sup>50</sup> G Blank, 'Trust on the Internet now exceeds trust in other major institutions', <http://microsites.oii.ox.ac.uk/oxis/blog/2010/trust-internet-now-exceeds-trust-other-major-institutions>
- <sup>51</sup> W Dutton and A Shepherd, 'Trust in the Internet as an Experience Technology', *Information, Communication & Society* 9, no 4, p 434 (2006)
- <sup>52</sup> Livingstone and Bober, 'Children Go Online' p 2.
- <sup>53</sup> Ibid
- <sup>54</sup> OfCom, 'UK Children's Media Literacy', p 52
- <sup>55</sup> J Palfrey and U Gasser, *Born Digital: Understanding the First Generation of Digital Natives* (Basic Books, 2009) p 161
- <sup>56</sup> Livingstone and Bober, 'Children Go Online' p 14
- <sup>57</sup> Dutton and Shepherd, 'Trust in the Internet as an Experience Technology', p 440
- <sup>58</sup> OfCom, 'UK Children's Media Literacy', p 48
- <sup>59</sup> OfCom, 'UK Children's Media Literacy', p 50
- <sup>60</sup> Futurelab (2010) *Digital Literacy in Practice*, p 9
- <sup>61</sup> [www.netskills.ac.uk](http://www.netskills.ac.uk). See materials on plagiarism.
- <sup>62</sup> D Nicholas, 'Digital Information Consumers, with special reference to the Google Generation', *University College London CIBER Project*, <http://www.ucl.ac.uk/infostudies/research/ciber/DNinduction.pdf>
- <sup>63</sup> *Telegraph*, Feb 11 2010, [www.ucl.ac.uk/infostudies/research/ciber/telegraph.pdf](http://www.ucl.ac.uk/infostudies/research/ciber/telegraph.pdf).
- <sup>64</sup> See for instance, K Popper *The Logic of Scientific Discovery* (New York: Basic Books 1959) especially section 6.
- <sup>65</sup> For a study suggesting that humans tend to seek confirmation of hypotheses they hold, see PC Watson, 'Reasoning' in B Foss (ed) *New Horizons In Psychology* (Harmondsworth: Penguin, 1966)
- <sup>66</sup> In one study, four fictitious studies on capital punishment, each with serious flaws, were given to subjects that felt strongly either for or against capital punishment. People were much more likely to notice the flaws in the studies that contested their point of view, rather than the studies that supported it. For this, and other experiments establishing this bias, see S Sutherland, *Irrationality* (Pinter & Martin, 2007), particularly Chapter 11 p 104-112
- <sup>67</sup> M McPherson, L Smith-Lovin and JM Cook, 'Birds of a Feather: Homophily in Social Networks', *Annual Review of Sociology* 27 p 415-444 (Volume publication date August 2001).
- <sup>68</sup> C Sustain, 'To become an extremist, hang around with people you agree with', *Spectator*, July 2009, [www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.thtml](http://www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.thtml)
- <sup>69</sup> E Pariser, *The Filter Bubble: What the Internet is Hiding from You* (Penguin, 2011); see also Pariser's 'TED Talk' at [www.thefilterbubble.com/ted-talk](http://www.thefilterbubble.com/ted-talk). See also *Economist*, 'Invisible Sieve: Hidden, Especially for you', 2011, <http://www.economist.com/node/18894910>
- <sup>70</sup> C Boulton, 'Google Serendipitous Search Plans Helmed by Marissa Mayer', *eWeek*, 17 Oct 2010, [www.eweek.com/c/a/Search-Engines/Google-Serendipitous-Search-Plans-Helmed-by-Marissa-Mayer-513716](http://www.eweek.com/c/a/Search-Engines/Google-Serendipitous-Search-Plans-Helmed-by-Marissa-Mayer-513716)
- <sup>71</sup> B Bosker, 'As Internet Use Grows, Is it Polarizing Political Views?', *Huffington Post*, 29 Mar 2011 [www.huffingtonpost.com/2011/03/29/internet-polarizing-politics\\_n\\_842263.html](http://www.huffingtonpost.com/2011/03/29/internet-polarizing-politics_n_842263.html)
- <sup>72</sup> C Sunstein, 'To become an extremist, hang around with people you agree with', *Spectator*, July 2009, [www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.thtml](http://www.spectator.co.uk/essays/all/3731248/to-become-an-extremist-hang-around-with-people-you-agree-with.thtml)
- <sup>73</sup> R Brown, *Social Psychology: Second Edition* p 203-26 (2003)
- <sup>74</sup> J Horrigan, K Garrett and P Resnick, 'The Internet and Democratic Debate', *Pew Internet* (2004)
- <sup>75</sup> Bosker, 'As Internet Use Grows, Is it Polarizing Political Views?'
- <sup>76</sup> M Gentzkow and JM Shapiro, 'Ideological Segregation Online and Offline', *University Chicago Booth School of Business*, (March 2011) p 1 [http://faculty.chicagobooth.edu/matthew.gentzkow/research/echo\\_chambers.pdf](http://faculty.chicagobooth.edu/matthew.gentzkow/research/echo_chambers.pdf)



- <sup>77</sup> S Yardi and D Boyd, 'Dynamic Debates: An Analysis of Group Polarization Over Time', *Bulletin of Science Technology & Society* 30 (2010) p 316
- <sup>78</sup> In the survey we referred to this as digital literacy, and not digital fluency
- <sup>79</sup> See <http://www.e-learningfoundation.com/press-releases> for their 19th February Press Release, 'Digital Divide – No Signs of Shrinking in UK Amongst Underprivileged'
- <sup>80</sup> Das, M., Ester, P & Kaczmirek, L (2011) *Social and Behavioural Research and the Internet*, European Association of Methodology, p 15
- <sup>81</sup> See <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=5672> accessed 28 June 2011
- <sup>82</sup> M, Das, P, Ester and L, Kaczmirek (2011) *Social and Behavioural Research and the Internet* p 34
- <sup>83</sup> Ofcom, Social inclusion and communications: A review of the literature, November 2007, [http://www.communicationsconsumerpanel.org.uk/downloads/Research/LowIncomeConsumers\\_Research/Social%20inclusion%20and%20communications/Social%20inclusion%20and%20communications.pdf](http://www.communicationsconsumerpanel.org.uk/downloads/Research/LowIncomeConsumers_Research/Social%20inclusion%20and%20communications/Social%20inclusion%20and%20communications.pdf)
- <sup>84</sup> Bethlehem, J (2007) *Reducing the bias of Web Survey based estimates*, Discussion paper 07001
- <sup>85</sup> The population comes from the 'School Workforce Census' of a base of 158,004 teachers, years 7-13
- <sup>86</sup> M, Das, P, Ester and L, Kaczmirek (2011) *Social and Behavioural Research and the Internet* p 31

This project was supported by:

**nominettrust**  
[www.nominettrust.org.uk](http://www.nominettrust.org.uk)

The internet is the greatest source of information for people living in the UK today. But the amount of material available at the click of a mouse can be both liberating and asphyxiating. Although there are more e-books, trustworthy journalism, niche expertise and accurate facts at our fingertips than ever before, there is an equal measure of mistakes, half-truths, propaganda, misinformation and general nonsense. Knowing how to discriminate between them is both difficult and extremely important.

*Truth, Lies and the Internet* examines the ability of young people in Britain to critically evaluate information they consume online. The report reviews current literature on the subject, and presents a new poll of over 500 teachers. It finds that the web is fundamental to pupils' school lives but many are not careful, discerning users of the internet. They are unable to find the information they are looking for, or trust the first thing they see. This makes them vulnerable to the pitfalls of ignorance, falsehoods, cons and scams.

This pamphlet recommends that teaching young people critical thinking and skepticism online must be at the heart of learning. Censorship of the internet is neither necessary nor desirable; the task instead is to ensure that young people can make careful, skeptical and savvy judgments about the internet content they encounter. This would allow them to better identify outright lies, scams, hoaxes, selective half-truths, and mistakes, and better navigate the murkier waters of argument and opinion.

Jamie Bartlett is head of the Violence and Extremism programme at Demos. Carl Miller is an associate of Demos.

978-1-906693-81-7