Do Web 2.0 tools really open the door to learning? Practices, perceptions and profiles of 11–16-year-old students

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In this paper, we report on survey and focus group data relating to the activities and perceptions of learning with Web 2.0 technologies of students aged between 11 and 16 years in 27 UK secondary schools. The study confirms that these learners had high levels of access to Web 2.0 technologies and that Web 2.0 activities were prolific. However, patterns of use were complex. The types of activity evidenced by the study suggest that learners can be categorised into four main groups: (1) *researchers*: mainly in terms of reading with little evidence of critical enquiry or analytical awareness; (2) *collaborators*: mainly with respect to file sharing, gaming and communicating; (3) *producers* and (4) *publishers*: mainly in terms of sharing experience through social networking sites. Whilst most expressed an interest in using online technologies to support familiar school activities, such as presentations or for communication, learners seemed cautious about other values associated with Web 2.0 tools, such as the shared construction of knowledge in a public format. Few learners were familiar with the complete spectrum of Web 2.0 activities and only a small number were engaging in more sophisticated activities, such as producing and publishing self-created content for wider consumption. There was little evidence of groundbreaking activities and only a few embryonic signs of criticality, self-management or metacognitive reflection. The paper concludes that these higher order thinking skills need to be encouraged and supported in any attempt to use Web 2.0 for learning in formal education.

Keywords: Web 2.0; critical thinking; digital literacy; schools; technology

Introduction and background

The increasing participation of young people in online worlds, and the read/write culture of Web 2.0 is the subject of ongoing discussion and debate in educational circles (Gee 2007). Current debate centres on what young people are doing with these technologies; where, how and for what purpose they are using them and how such activities might usefully be harnessed in formal educational settings. Recent research portrays young people as prolific consumers and producers of digital content (Lenhart and Madden 2005), video and music mashups and remixes of existing content (O'Brien and Fitzgerald 2006), writing blogs (Lankshear and Knobel 2006), fan fiction (Lankshear and Knobel 2005), playing games (Gee 2004;

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Pelletier and Oliver 2006) and producing online commentary about topics of interest (civic participation, citizen journalism, political voice, etc.). Young people are said to participate in these activities not only as individual users but collaboratively and cooperatively as interest or purpose-driven communities of practice. There is evidence that some young people are making effective and/or 'groundbreaking' use of Web 2.0 and other internet technologies. These are however a minority and the same cannot be said of all young people and their online activities (Green and Hannon 2007).

The range and variety of internet-based tools and practices adopted by young learners are potentially important for enhancing our understanding of ways in which they may be appropriated to support technology-mediated learning in schools. Various suggestions as to the way in which one might categorise users into different types based on these practices have been proposed. For example, Green and Hannon (2007) identify four types of user: digital pioneers, creative producers, everyday communicators and information gatherers. Grunwald Associates (2007) make a special case for the digital 'non-conformist'. Like the 'digital pioneers', these users are engaged in leading edge, groundbreaking activities and are a minority category. They are said to possess 'a significant set of twenty-first century learning skills (communication, collaboration, creativity, leadership and technology proficiency)' and are described as being 'more likely than other learners' to be 'traditional influentials, promoters, recruiters, organisers and networkers'. An alternative approach is adopted by Locke (2007), who links users to their 'spaces' and presents a user-centred model, based around user assumptions, behaviours and relationships. His categories include Secret Spaces where activity is private, intimate and controlled using tools such as SMS and instant messaging (IM); and Participation Spaces where activity is coordinated with the individual acting towards a common goal, using technologies such as *Meetup* and *MySociety*. In addition to suggestions that learners can be categorised into different types, there are concerns raised about the small number of learners involved in 'groundbreaking' or 'pioneering' activities (Green and Hannon 2007).

The activities discussed so far are mainly those conducted outside school. Research suggests (Selwyn 2006) that young people's use of technology in school is limited and constrained by a variety of issues ranging from regulation (filtering, surveillance, control, checks, use policies, gatekeeping activity), temporal (timetabling), spatial (lack of 'open' access) and technical constraints (hardware quality, multiuser reduction in connectivity speeds, system bottlenecks, outdated software) and personal effectiveness (lack of criticality, low information literacy skills). For those of us interested in exploring how Web 2.0 technologies might better support learning, it is important and timely to ask what types of learner skill and activity can support learning through Web 2.0 technologies and across informal *and* formal settings. Buckingham (2007), Jenkins et al. (2006) and Green and Hannon (2007) focus on the notion of learner criticality as a set of primarily cognitive skills and practices. Lenhart and Madden (2005) and Grunwald Associates (2007), on the other hand, focus more on technical skills sets. Others, such as Van Dijk (2005) take a more holistic approach and suggest that learner criticality involves the development of a metacognitive awareness of technical, cognitive and cultural aspects of technology use.

These suggestions about the importance of metacognition for criticality need to be considered in conjunction with previous work that has indicated the importance of metacognitive activity for learning (Flavell 1979) and deep-level processing (Brown

1987; Goos, Galbraith, and Renshaw 2002). They also need grounding in the flexibility that Web 2.0 technologies offer through its encouragement of interactions across domains and environments, such as those inside and outside school. Learners however do not spontaneously apply their metacognitive strategies across domains and environments (Kuhn 1999). It is therefore reasonable to suggest that specific support designed to help learners apply their metacognitive strategies appropriately is desirable if these technologies are to be effectively harnessed for the purposes of learning. Seeking to engage learners' at this higher level should also generate a bridge between teachers and learners in their perceptions of the utility of such tools as a support for learning in an environment constrained by assessment needs and the acquisition of established bodies of knowledge in ways not anticipated by participatory technologies.

In this paper, we report on the practices, perceptions and profiles of 11–16-year-old learners and their use of Web 2.0 technologies. In particular, we focus on the types of tools learners have access to and the practices they engage in with these tools. Crucially, we also focus on learner' perceptions of the utility of Web 2.0 practices as part of their everyday lifeworlds on the one hand and as a support for learning in formal educational settings such as school, on the other. In terms of exploring issues of higher order thinking, our discussion of the findings focuses on metacognition and criticality with the aim of exploring ways in which the popular, but basic-level engagements with Web 2.0 technologies can be enhanced through deeper reflection on their learning potentials by learners and their teachers. This aim is discussed more fully towards the end of the paper, in which we also consider how learners might best gain these skills and the important role that their teachers and their institutions can play.

Research questions and methods

With these issues and debates in the mind, the remainder of this paper focuses on the following research questions:

(1) What specific Web 2.0 technologies did learners report making use of?
(2) What types of activities were Web 2.0 technologies being used for?
(3) What different types of Web 2.0 users can be identified from these data?
(4) What differences were apparent between school and non-school engagement with Web 2.0 technologies?

These research questions were addressed through two sets of related data collected as part of a wider research project into Web 2.0 in the UK secondary schools. Firstly, data were collected from a guided survey of 2611 learners in Years 8 and 10 in 27 schools – 26 of these schools were located in England and one in Wales. Two school groups were used in the construction of the study sample: 15 schools deemed representative of a range of school types and demographic variables referred to as the national sample (NS), and 12 schools deemed representative of school environments in which Web 2.0 activity was flourishing (referred to as the Web 2.0 sample – W2). All survey data were gathered using a 'Guided Survey' technique, where at least one team member was present in the classroom each time the survey was run. A *PowerPoint* presentation preceded the survey and took learners through the format and structure of the online questionnaire. The researcher encouraged whole-class

discussion of terms such as 'social networking', 'blog', 'wiki' and 'VLE', before the questionnaires were filled in individually. The researcher and class teacher supported students who needed help or guidance.

To complement these survey data, 60 focus groups were subsequently held across 22 of the schools. Group size ranged from 2 to 13, with 4–6 learners being the norm. Thirty-six focus groups were held at NS schools and 24 at W2 schools. Focus groups were designed to last around 25–30 minutes, but some lasted as long as an hour. Recordings were transcribed and transcripts were analysed using NVIVO software. A stratified random sample of 24 focus groups was selected for analysis for this paper: a single group was randomly selected from each available year group at each available school. Quotations used in preceding sections are derived from learner comments in focus groups and are intended to illustrate learner perceptions of particular activities under discussion rather than as portraying typical examples across the board.

Results

What specific Web 2.0 technologies did learners report making use of?

In this section, we present findings that illustrate the nature of the Web 2.0 technologies used by learners.

Social networking and artefact sharing

Reported use of social networking sites was extensive: 74% of respondents having at least one account, with students in W2 schools reporting significantly higher ownership, at 79%. Whilst this does not mean that learners made *regular* use of these accounts, we can say that they reported *recent* use, with 62% overall claiming to have used one in at least the last week. A wide range of sites was used, with over half of respondents nominating at least two. However, there was some confusion in the minds of respondents as to what counts as a social networking site, with nominations including *YouTube* and *MSN*, for example. Of sites more clearly focused on social networking, *Bebo* was a clear favourite (53%), followed by *MySpace* (18%) and *Piczo* (3%). Over 80% of respondents had participated in artefact-sharing activities, on social networking sites such as picture sharing, video sharing and music downloading. A third of participants reported that they had participated in each activity 'in the last 24 hours'.

The focus group data offer more detail on these findings and some explanation for learners' selections:

> *Bebo*'s like made for our age and Facebook is made for the older people.
> *MySpace* is for our age. (Year 8)

The most common product being uploaded and published onto social networking sites by learners was photographs. Learners reported sharing photographs using these sites, suggesting that uploading and sharing photographs was common, and describing the benefits of using social networking sites to capture and publish shared social experiences:

> Like I was at a party but I didn't bring my camera, then I could go and look at the pictures if someone else has been at the party … (Year 10)

Posting one's own videos onto social networking sites was a very rare activity, with only two learners doing this, though the popularity of *YouTube* suggests that recommendations for popular videos may be spread through these sites. Posting music occurred with slightly greater frequency, with approximately 36% of learners uploading music out of school, and just 5% uploading in school. It was not apparent, however, that the music posted was created (i.e., composed rather than ripped) by these learners.

The primary motivation for engaging with social networking sites is interacting with one's existing social network. Learners found these sites useful for keeping in touch with friends, even when these were friends from school. From a practical perspective, financial and geographic considerations predominated. Social networking was regarded as 'free' by learners. As one learner reasoned, 'you can talk to them for longer. It doesn't cost' (Year 8). From an attitudinal perspective, therefore, learners' saw these as a place to 'hang out' with friends, a place to have fun or to pass the time when bored:

> …like inventing your characters and stuff, that's quite fun as well. Like meeting different characters, that's fun. (Year 10)

Email and instant messaging

Email and IM were also reported to be popular activities. Ninety per cent of learners used email out of school. Over 65% had more than one email address, and around 28% had more than two. IM was more likely than email to have been used in the last 24 hours, over 55% of participants stated that they had used IM in the last 24 hours. Whilst email is not a Web 2.0 technology, its prevalence provides a useful comparison against Web 2.0 technologies and IM. Email was accessed more by those learners who had no access to social networking sites because of parental restrictions. Email was also the preferred way for learners to contact teachers. Learners reported misunderstandings to be fairly common when using these technologies, because of the absence of gestural and other non-verbal information that would otherwise be used to help interpret ambiguous statements, such as 'calling each other daft names' (Year 8).

Wikis and blogs

Wikipedia was the most popular site accessed by learners using the internet for research, behind search engines such as *Google*. However, only two learners reported actually editing a wiki document: this was said to be done as a joke and one was banned from the site. Two learners indicated that *Wikipedia* was ideal for informal (i.e., not mediated or directed by school) learning: because one can trace information, and because the site presents, '…little facts, just random ones… and they've got like an article for every day which is always quite interesting' (Year 10).

Blogging was not a particularly popular activity across the sample, but where it occurred, it often did so within the arena of the social networking site. *Bebo* is one site that enables its users to post to blogs. In this sense, the blogs that belonged to social networking sites were perceived to be for communicating 'random stuff that you find funny' (Year 10). Learners at one NS school described blogs as being quite popular to read, though not to produce. For one learner, blogs were a way to find out about popular sites on the internet, with specific reference to learning, this included history

and geography projects. Using blogs in the classroom proved motivating for those few learners who had reportedly experienced it:

> Because like if someone that you know comes from a different country or different place or doesn't come to this school then it's easier to hear from them or talk to them through that than just picking up the phone. (Year 10)

Online multi-player games

Online multi-player games were popular across the sample, although some learners adamantly did not wish to engage with these types of games. For one learner, the opportunity to build social relationships presented a problem rather than a potentially positive experience:

> I'm just not a particularly confident person when it comes to you know, like engaging with people, like, so that doesn't appeal to me that much. (Year 10)

For others, the opportunity to broaden one's friendships through networking in these games was a key motivating factor, along with creating and interacting with other character creations:

> I think like being able to meet people on the internet and like talk to them, that's kind of like good, but like inventing your characters and stuff, that's quite fun as well. Like meeting different characters, that's fun. (Year 10)

Podcasts, forums/discussion boards

Despite widespread access to MP3 players, only five learners at two schools reported that they listened to podcasts. One learner indicated that he was introduced to podcasts through a relative who works in IT education, receives monthly podcasts, and saves those of interest. Another learner at the same school indicated that he had listened to podcasts made by another learner:

> I've listened to a couple but I don't listen to them regularly – I just don't find the time to listen to them really. (Year 10)

Learners from only three schools reported using online forums or discussion boards. Examples given related to games and music.

What types of activities were Web 2.0 technologies being used for?

In this section, we turn from the types of Web 2.0 technologies learners are using and with what level of frequency to consider in more detail the types of activity being engaged in. In particular, we consider the extent to which the data we present is consistent with the suggestions from the literature that learner activity is not 'groundbreaking', but superficial and lacking sophistication. We therefore base this section with findings from the focus group data about the levels of complexity and sophistication of Web 2.0 use amongst participants.

   These focus group data shed some light on the ways in which learners are, and are not, using Web 2.0 tools for more sophisticated activities. Here we concentrate on

examples of technical sophistication, discussion around interests and critical analysis. Production and publication activities can also be complex and sophisticated and these are discussed under a separate heading later in this paper. Discussions with learners revealed some examples of learner activity that suggest a relatively sophisticated level of technical knowledge:

> HTM and PHP I've managed to like learn quite well so I can update my website and write other [inaudible] and stuff like that, so it's quite useful… There's just loads of things you can do, like make your own skins for your web page and add little modules and applications and little games that you access and make it personal to you… You just like add a feed from the – when you go onto a website and you usually have a link to their RSS group and you like click on that and like a window comes up and you put it into… and then it like feeds in, so you can like get tons of feeds in and the software recognises which ones you read most and it can put articles up for you and things like that. (Year 10)

This learner's knowledge of the domain of web page design demonstrates a high-level knowledge of specialist terminology and a reasonable level of contextual awareness which appears to be largely experiential learning. There is little evidence, however, of learner criticality around content.

There were also examples of learners whose hobbies and interests had engaged them in more sophisticated discussions:

> Teen17 which is a, it's sort of like a, it's a company off EA Games and you can like discuss like the games on there and what you've found in the games, like glitches and errors and bugs and stuff like that and the EA Action Team send out, email these patches, just sort them out, all out. (Year 8)

Whilst at a surface level, this learner's commentary reveals a certain level of technical skill, it also reveals a developing metacognitive awareness of the contexts around gaming and the ability to problem-solve and troubleshoot issues related to games. In this sense, the learner understands the need for assistance, knows where to locate that assistance and has developed sufficient experience to apply that support appropriately to some personally located problem. Comparisons could usefully be drawn between this level of sophisticated activity and the kinds of metacognitive skills needed to generate dialogue and find solutions in more formal learning contexts. Similarly, the use of discussion forums and resource banks could be translated across contexts to school- and subject-mediated contexts.

Some learners felt that the internet can be less text-heavy than books, and their experience of this may inform their decision about what resources are useful to them. As one learner argued, they preferred 'something that isn't just loads of writing because then that would really bore you' (Year 8). This suggestion that learners prefer to read less and are easily bored indicates low levels of engagement with textual information and low levels of criticality around what constitutes knowledge. Whilst the data show that learners have the potential to be critical consumers of information on the internet, they are selective in applying that criticality. For example, whilst learners did show a generally sophisticated understanding of the unreliability of online information, and sometimes made efforts to verify the information they found, at other times, they resorted to shortcuts and poor confirmation strategies.

Unsurprisingly, participant reports from focus groups indicated that copying and pasting information from the internet was extremely common. Motivations for

copying and pasting reported by learners related to feeling pressure from the expected length of assignments whilst not being engaged with the task, and the absence of perceived credible checks:

> When you've got stacks and stacks of homework and somebody decides to give you a pointless question, just for the sake of giving you homework, I think it's the only option you have actually. (Year 10)

Some learners debated whether or not copying and pasting could result in learning, with an almost even split between those who thought they learned from reading through the material and changing words, and others who did not think they received any educational benefit. Although the availability of information was praised by many learners, the vast quantities of information available online were sometimes deemed difficult to handle and much of the utility of search engines depended upon 'if you get the right site' (Year 10). Another learner said:

> I find *Google* really confusing though because you type in one thing and a thousand things which I'm not looking for come up as well, it's half aren't related I don't think. (Year 10)

Four learners reported using more sophisticated strategies to determine whether information on the internet was reliable. These strategies included examining the description of the link, looking for official websites, using sites recommended by schools and counting the number of key words hit.

What different types of Web 2.0 users can be identified from these data?

Perhaps one of the key findings arising from these data was that the gap between consuming content and actually producing and publishing seems great for most learners, even as they take steps towards creating a stable public online presence through the use of social networking sites. Based on the findings from both the guided survey and focus groups, we are able to identify four categories of learner based upon the types of learner activity evidenced within the data. This categorisation is not designed to be exhaustive, but rather to describe the different ways in which learners use Web 2.0 technologies. The types of activity evidenced by the data suggest that, of the categories of user identified from the literature, there are:

- *Researchers*: but mainly in terms of reading with little evidence of critical enquiry or analytical awareness;
- *Collaborators*: with respect to file sharing, gaming and communicating, with only few examples of collaborative knowledge construction; and
- *Producers and publishers*: in terms of sharing experience through social networking sites; and with input from teachers there are some examples of copublication and production.

These categories are now described in further detail.

Researchers: research and enquiry activities

The first type of learner derived from the data was that of the researcher. The researcher is characterised as a learner who commonly refers to online resources as a

Table 1.   Sites used by learners to find information. Data are percentage of students.

Site	National survey schools sample	Web 2.0 schools sample
Wiki encyclopaedias	58.0	56.9
Educational – general	29.2	35.8
Media (e.g., BBC, ITV, Channel 4)	18.2	16.1
Search engine	15.0	21.7
Mathematics sites	11.2	6.6
Language sites	5.4	2.2
School's VLE	5.0	15.0
School's website	3.3	6.9
Email	0.5	1.5

means of retrieving information and/or extending their knowledge base. Most learners fell within this category. Results from the study suggest that learners commonly used the internet to support personal research and inquiry (i.e., research driven by their own interests), but only rarely employed Web 2.0 tools for this. The internet was also commonly used to assist with schoolwork and homework. Survey data about the types of sources learners seek information from show that a few sources are used heavily (see Table 1).[1]

Learner comments suggest that the educational sites they use are recommended by teachers, suggesting that learners are often reliant on teachers' recommendations and do not search for *educational* resources themselves. The frequency with which these sites are used, however, could affect their page ranking in search engines so that they are the primary sites presented when searched for, and also may reflect their systematic use by some teachers with their learners for homework. Importantly, learners were asked to exclude search engines from their list of sites as researchers assumed that these were widely used, though some learners clearly entered these anyway (or were perhaps, as in the case of *Google*, referring to applications other than the search engine available at that website). As such, it is likely that the finding that search tools such as *Google* were ranked 3 and *Ask* (ranked 10) were underestimates of their popularity.

Researchers probed learners' understandings of the participatory nature of wikis and the implications this may have for the reliability of information. Most learners understood that wikis could be edited by anyone, and the implications this had for reliability:

> Sometimes I get confused because it's written by anyone, sometimes it says one thing and then you look at another website or another part of the *Wikipedia* page and it says a completely different thing. What do I do? (Year 7)

The participatory nature of wikis was also cited as being problematic:

> *Wikipedia* should be more factual, but if there's going to be people that are going to write stuff about certain issues then they shouldn't be allowed to edit things… They can't be vague or anything. They've got to keep it fair and honest. They should at least try to be truthful. (Year 10)

Most learners indicated that they were dubious about the reliability of wiki information, though few indicated that they consistently verified the truthfulness of information

found on *Wikipedia*. Strategies included looking for obvious mistakes or jokes; clarifying conflicting information with a book or a parent and believing what was written without pursuing confirmation.

Of the learners who used Web 2.0 tools, other than or in addition to *Wikipedia*, to support informal learning, examples included using *YouTube* to watch videos about a hobby; accessing other users' artwork for ideas about one's own; using *eBay*; downloading music; accessing and posting to forums for a hobby; using virtual world programmes; contributing to a genealogical social networking website; engaging with a wiki for a Youth Congress; and researching the historical context of a game:

> I have a game and it has an encyclopaedia on it and it says all this history about the characters and stuff and I didn't think it was real, so I typed one of the names up in *Wikipedia* and it was all these real people which lived in like 200 AD China or something, so I thought it was quite interesting and I just keep finding out more about that every day. (Year 10)

Collaborators: learners working online together

The second type of learner derived from the data was that of the collaborator. The collaborator is characterised as a learner who uses online networks and technologies to work together with others, whether they be peers, teachers or other 'experts'. Web 2.0 technologies offer unprecedented opportunities to work collaboratively, given the right situation, attitude and skill. Yet though a few learners reported engaging in genuinely collaborative learning using Web 2.0 technologies, most learners reported that they did not do so, or interpreted working collaboratively (often phrased in interview as 'working together online') to mean using Web 2.0 technologies to support fairly superficial conversations about work, or working together at one computer.

At least two dozen learners reported using Web 2.0 tools to support 'chat' about work. Examples include using IM to ask what homework questions were set, exchange answers or check deadlines; explaining task requirements to absent peers; and coordinating work to avoid duplication. In addition, there were examples of using the internet to communicate with a friend at another school about an unclear concept; commenting about a video on a *Bebo* page; 'swap[ping] ideas on homework' through IM (Year 7); and – prompted by a teacher – uploading work to send to another person for commentary (Year 10).

Two learners reported what they regarded as collaborative assessment with their teachers as being able to submit draft work and have it returned with comments by the teacher allowing them the opportunity to incorporate the comments prior to final deadlines. Finally, learners at one school spoke about using blogs to brainstorm ideas for video conferences, which they found useful and interesting but not compelling, compared to social uses of Web 2.0 technologies.

Some learners were able to articulate why they preferred not to engage in more substantive collaborations using Web 2.0 technologies:

> I prefer to do it face to face or on the telephone, because online like as well if it's maths you can't write like or type the like… all the little squiggly things, like the formulas and all that, you have to write it all out and if it's all divided by two you can't just draw the line and two and stuff. (Year 10)

One learner articulated a tension that was discussed in many interviews with teachers: the conflict between collaborative learning and the sometimes-restrictive assessment procedures learners may be subject to:

I've done it only as when it's doubles work, like only as a pair, because you can get told off if you've got work that's too much the same, like if like it's only one person, like you're supposed to do it individually, then, and you send it to someone and they use it the exact same, you're going to end up in trouble, because they could say that you copied them. (Year 10)

The lack of synchronous communication means that social networking sites may not be ideal arenas through which to conduct collaborative learning. Additionally, some learners viewed the online social space as an important *respite* from school; when asked about bringing social networking into school for learning, learners generally continued to envisage the tool being used for socialisation rather than learning, unless further prompted by the researcher.

Producers and publishers: learners as content creators

The final types of learner categorised from the data were producers and publishers. These learners are characterised as those who create content, whether it be in the form of photos, artwork, music, podcasts, games, etc. or those producing and publishing more text-based content such as blogs, wikis, etc. Despite learners' avid consumption of products using Web 2.0 tools (e.g., *YouTube*), relatively few learners are producers and publishers of self-created content for wider consumption. Results suggest that in order to be motivated to publish content, learners must perceive that publication carries utility for the self or important others.

For some learners, utility is satisfied through the creation of a personalised space – this appealed to most learners who had experience of publishing:

> You can like share your life with other people and nobody will mind about it because it's just your life and you can put what you want on it. (Year 10)

A group of learners were allowed to generate their own web page within the school setting, which they were able to personalise with a considerable degree of freedom as to content, style, layout, etc. The opportunity to choose style formats was appreciated by another learner, and still another valued that she could continue the project at home. One learner noted that 'it was fun, because it was sort of a little project which you could do' (Year 10) – suggesting that publishing is manageable, appealingly project-based and provides a sense of ownership and efficacy. The ability to use a web space to connect with peers was a primary benefit perceived by learners in one sample who had experienced publishing as a form of debate and discussion on topics of personal interest.

For some learners, this presented an opportunity to challenge peers to think about ideas they felt strongly about. In one group, learners went beyond the survey to create discussion boards or blogs. Learners valued the space to present information that they deemed valuable, such as presenting topics for debate that they felt to be important, as in the example below:

> And so it's like that's quite a good thing to share your opinion on and I've put a page on like, well, there's not actually that much on fox hunting, there's a little bit like about controlling the rabbit population and then there's about badgers, because that's been quite, you know, high up in the publicity recently, that's because they were having a, well, possibly having a cull to reduce numbers. So I've put like my opinions and some facts on there to inform people. (Year 10)

This is quite a sophisticated use of websites and blogging that involves: selecting a timely topic, providing both factual information and personal opinions, and enabling readers to comment. It should be contrasted with the more personal, 'diarist' perceptions of blogging that other participants held. The type of material that is being published is therefore also of significance in determining whether a learner perceives the exercise to have utility.

One of the only learners in the sample to keep a blog noted that she does not expect other people to read it, as she keeps it private. Some learners valued a 'walled-garden' approach to publication. The opportunity to experiment with publication in a protected environment (but with social networking still in play) proved attractive to one user:

> It's sort of a good way of learning, or doing, learning how to do it in a safe way before you go and do it out of school where there's a lot more dangers. (Year 10)

There is thus a perceived tension between feeling that one should publish compelling information if one is to publish anything at all, and desiring to keep certain aspects of one's life private. This tension is informed, in part, by preconceptions about the potential applications of Web 2.0 tools, and as shown earlier, some learners have more sophisticated understandings of these than do others.

There were few examples of learners publishing video. One male learner reported uploading videos he created to *YouTube* and another group of friends were trying to upload their created videos to *YouTube*, but had only succeeded in publishing to *Bebo* thus far. Reasons for not publishing work online included lack of time and interest and a fear of plagiarism by others if their work were to be posted publicly. Learners also felt reluctant to have others judge the quality of their work, as one learner reasoned, 'if it wasn't very good then I'd hate it' (Year 10).

What differences were apparent between school and non-school engagement with Web 2.0 technologies?

In this final section of our data analysis, we discuss the difference in these Web 2.0 activities in terms of setting – i.e., inside and outside of the school. Access to computers and the internet at home was reported to be very high with 98.4% of the total sample having access to a laptop and/or desktop computer and 96.6% having access to the internet. It should also be noted, however, that the nature of access can be complex. Only a minority of learners had their own laptop or desktop computer, and for most the computer is a family resource, resulting in constraints on the amount of time they can spend using it, as well as when they might be able to do this. By contrast, learners reported rather little computer activity in school. The survey data provided information about the amount of time learners spend working on computers for work and leisure inside and outside school (Table 2), with learners spending, on average, more time working on school work on a computer outside of school than at school itself and 34% of learners estimating that they spent only an hour each week using a computer at school.

Figure 1 illustrates the number of learners who use different Web 2.0 tools in school, outside of school and across both locations. Notably, there is heavy use of *Wikipedia* both in and out of school. Learners' participation in other activities are in strong contrast to the use of *Wikipedia* and their use of these at home far outweighs the proportion that have used them at school. In effect, schools are not using

Table 2.   Estimated average time spent by learners on computer-related activities at school and outside of school.

	Mean (hrs/week)	SD
At school: doing work on a computer	2.46	2.43
Out of school: doing school work on computer	3.29	3.54
Out of school: typing/reading your email or instant messages	4.76	5.08
Out of school: social networking sites	4.13	4.97
Out of school: games	3.86	4.83
Out of school: general web browsing	3.60	4.11
Out of school: other computer activities	2.64	4.09

technologies that many pupils are familiar with and which could be used as teaching resources such as listening to a radio programme online or watching an online video clip despite a number of excellent educational audio and video resources available on the web. This, however, is perhaps not surprising as it strongly reflects the findings in the existing research literature (Selwyn 2006; Clark et al. 2009) that, in the schools surveyed, current web filtering policies are too restrictive, particularly in those schools with no direct control over filtering activity, which may be controlled by local education authorities, Borough Councils and Internet Service Providers, with teachers finding that this excludes their use of valuable teaching resources such as those to be found on *YouTube*. Learners' use of other Web 2.0 examples out of school is also much higher, such as writing to an internet discussion board and commenting on
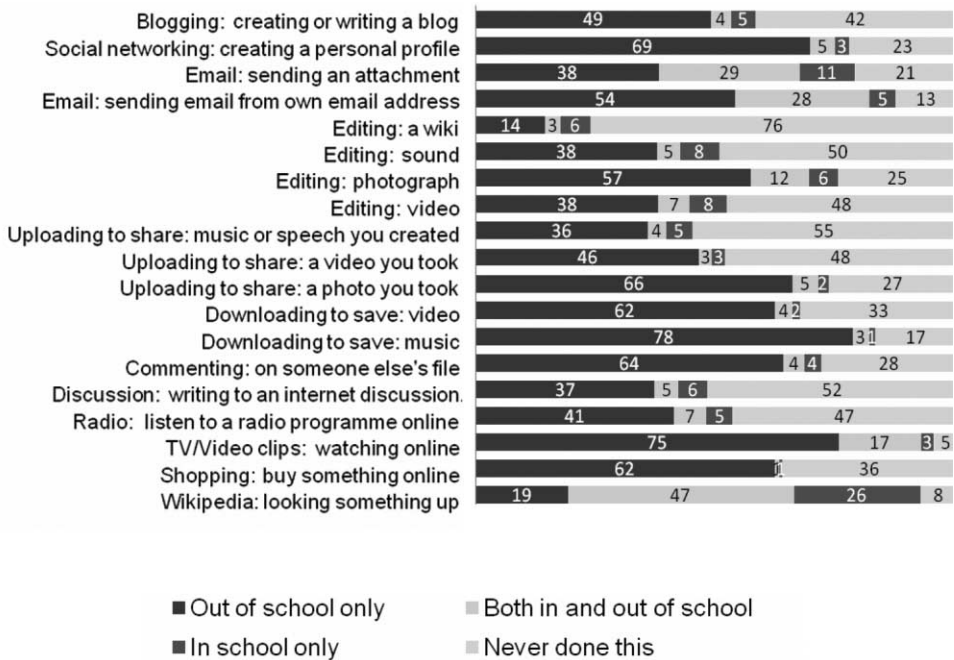

Figure 1.   Learners' use of related Web 2.0 activities in and out of school. Data are percentage of survey sample (*n* = 2611).

another person's files. This suggests both familiarity and willingness by students to take part in this type of activity.

Our focus group data can add some detail to these findings. For example, with respect to social networking there are clear differences in use:

> As much as I like them, they shouldn't be doing in school… Because what's the point of coming to school? You come to school to learn and then when you go back home, that's the time to do it. (Year 10)

When it comes to what learners would like to be doing in school with technology, their views are relatively traditional. They are very much in favour of using *PowerPoint* in school, with 78% thinking this is important or very important. Learners are also in favour of making videos, with 53% believing it to be important in class. Displaying their work for anybody to see has a mixed reaction, with many learners (38%) feeling neutral about this. However, this appears to be tied to concerns about *who* sees it, rather than about the technology, as learners are more positive about displaying work which is only available for the school community to see. Learners who have no experience of creating wikis and podcasts are more neutral about the potential of these technologies to support school work and 66% feel neutral or uninterested about the prospect of using blogs. By contrast, communicative activities were felt to be important and being able to link to other schools and chat to other learners was widely believed to have value for in-school learning.

Discussion: what could be happening to increase and improve students' learning with Web 2.0 technologies?

The data discussed above reflect some consistency with that reported in the literature review at the start of this paper. There was high use of social networking and file-sharing sites, particularly for sharing photographs, high use of games, email and IM, but low use of podcasts, blogs and wikis except *Wikipedia*. The types of activity revealed by the data illustrated little evidence of critical enquiry or analytical aware-ness, few examples of collaborative knowledge construction, and little production or publishing outside social networking sites. We also confirm the low level of computer activity at school when compared to use at home and also illustrate the difference in the type of activity being undertaken inside and outside school.

In particular it was noticeable throughout our data that the activities of researching, collaborating, producing and publishing were only being done by the majority of participants in a relatively simple and unsophisticated manner. This lack of sophisti-cated use may be due to a lack of technical knowledge. There is, however, also a lack of evidence of higher order thinking skills amongst participants. The evidence that does exist of learners who are using these technologies at a higher level of sophistica-tion illustrates that such activities require input from a more able partner, such as a teacher or more experienced collaborator in a shared field of interest, or that they are developed over time through deep personal motivation and interest. Learners depend heavily on school input for their selection of information sources and it is teachers who have inspired the use of Web 2.0 tools in a more complex or sophisticated manner. However, as the data have evidenced these examples of complex use are few. This suggests that whilst learners are able to complete basic technical operations and follow recommendations about information sources, they encounter difficulties in

their attempts to transfer technical know-how (i.e., how to search) into metacognitive know-how (i.e., how to contextualise and conceptualise knowledge content and knowledge contexts).

In the literature review at the start of this paper, we highlighted some of the skills that learners need in order to make better use of Web 2.0 technologies for learning. We now return to that discussion in the light of the evidence from our data to consider how we might better support the use of these technologies for learning. Whilst there is some support within our data for the need for technical skill sets as suggested by Lenhart and Madden (2005) and by Grunwald Associates (2007), we focus more particularly on some of the ingredients within the skills sets suggested by Buckingham (2007), Jenkins et al. (2006) and Green and Hannon (2007) and known to be important for learning: namely metacognition and critical awareness. In particular, we consider the need for learners to be able to transfer skills across domains and environments as highlighted by Kuhn (1999) and upon the role of teachers, schools and educational institutions.

In our discussions of blogging, learners' perceptions of blogs were shown to be limited to insights afforded by their personal experiences of the genre as a repository 'for random stuff you find funny' (Year 10), or an 'online diary' which confounded one student (Year 10) who commented 'aren't diaries meant to be secret' and as something of an onerous commitment 'you have to write too much' (Year 8). By contrast, where student engagement was facilitated by teachers, for example, in the further development of an initial debate conducted in the form of a web-based survey, learners' vision of the learning potential of blogging was enhanced and they perceived the opportunity to challenge their peers to consider and discuss issues they felt strongly about to be a key benefit. Such activities can contribute to learners' critical awareness and to their understandings of the way that knowledge is justified. This sophisticated use of blogging, supported by related school-based discussion and debate supports the learner in constructing her narrative: selecting a timely topic, providing both factual information and personal opinions, and enabling readers to comment. It also facilitates a reframing of the relationship between environments inside and outside of school. This involves a reframing of school-based technology use away from individual production and 'closed' audiences. It also involves a reshaping of learners' out-of-school perceptions of audience, purpose and the communicative potential of these media to include topics and reflections that develop beyond the banal, the social and the everyday.

Whilst some learners demonstrated a level of sophistication in relation to their use of Web 2.0 tools to support informal learning, for example the use of *YouTube* to support a hobby such as horse riding, drama and playing musical instruments or the use of fan fiction sites to develop interests in creative writing, these instances were few and far between. The suggestion here is that the collaborative aspects of Web 2.0 technologies might support deeper levels of engagement through feedback, peer review and the development of a sense of audience and shared purpose. Greater teacher understanding of the deep levels of engagement these online facilities can provide for learners could translate into a higher level of critical engagement with information and communications technologies, through discussion of media, the reliability of information and justification of knowledge, forms of representation, narrative, genre and audience.

Learners are clearly motivated to use Web 2.0 technologies and there is evidence to suggest that teachers have an important role to play in assisting learners to make more sophisticated use of these technologies to support learning. However, the

current contexts and cultures of schools often offer teachers limited scope to incorporate them, with other requirements taking precedence, such as e-safety, privacy, hierarchical organisation and infrastructure, set bodies of knowledge, assessment, and a long-standing pedagogical tradition that favours the individual over the group, the text over other modalities, and the enclosed environment over the open. This puts teachers in a difficult position. Changes are taking place in the everyday lives of learners in relation to:

- the forms, representations and multiple modalities of digital communication that are already integrated into their everyday lives;
- the increasing convergence and connectivity of creative and communicative technologies;
- the development of participatory networks at local and global levels; and
- the provision of relevant, real-time, real-world scenarios for learning.

This situation opens up new opportunities for learning that encompass and transcend school and other locations. Teachers, learners and institutions need to be able to develop new ways of thinking about technologies and new ways of understanding and interacting with the new opportunities they afford. This does not mean that the Web 2.0 technologies popular with learners at home should be directly imported for use in school. It does mean that we need to consider popular behaviours and activities and consider how they might support learning. For example, the finding that sharing photographs appears to be a significant part of the social networking experience for learners suggests that they perceive some value in the activity whether as a means of alleviating boredom or to illustrate naturally occurring events, like parties. Could such practices generate motivation in the classroom? An example might be the translation of learners' interest in photo sharing to the use of photographic narratives to illustrate scientific experiments, dramatic reconstructions, facial attributes in art or the stop-motion capture of physical activity, for example.

A recent study by Hartnell-Young and Heym (2008) also identifies the important role that teachers have to play in assisting not only learners, but also schools, in appropriating and making effective use of Web 2.0 and mobile technologies. Teachers need to be willing to embrace risk, to consider small ways of navigating existing cultures and reframing old contexts to incorporate new ones. But it is not down to teachers alone, parents, institutions and policy-makers also have a role to play – in supporting teachers to take that risk.

This requires the development of a pedagogic model which provides the in-school learning community with a conceptual model of the learning potentials of these technologies and the kinds of connections these can engender across and between spaces for learning. Using these models, teachers could more easily facilitate learners in making appropriate selections and choices which are contextually relevant and which draw upon the learner's constantly evolving repertoire of skills. In this sense, the role of the teacher remains crucial, but differently situated, changing from director to facilitator of learning. The role of the school, too, may change, from curricular gatekeeper to learning hub: a digitally mediated learning space in which teachers and students are all perceived as learners, and learning is perceived of as a continuum framed by the Vygotskian notion of *obuchenie* (Luckin et al., forthcoming). In this sense, the school as learning hub mediates multiple learning contexts, learner types and knowledge domains and facilitates collaborative, contextualised, knowledge

building across and between disparate environments: home, school, peer group, interest groups and community groups. In this scenario, technology facilitates a more flexible view of knowledge acquisition alongside the prospect of participatory learning framed by metacognitive awareness and critical acuity. And for learners, technology offers the potential for them to adopt the role of navigators of knowledge, of content creators, producers and publishers, with knowledge viewed as a collaboratively produced phenomena, shaped by culture, context and co-generated communication.

Notes

1. The caveat that certain sites being used heavily by particular schools can bias the results applies here.

Notes on contributors

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