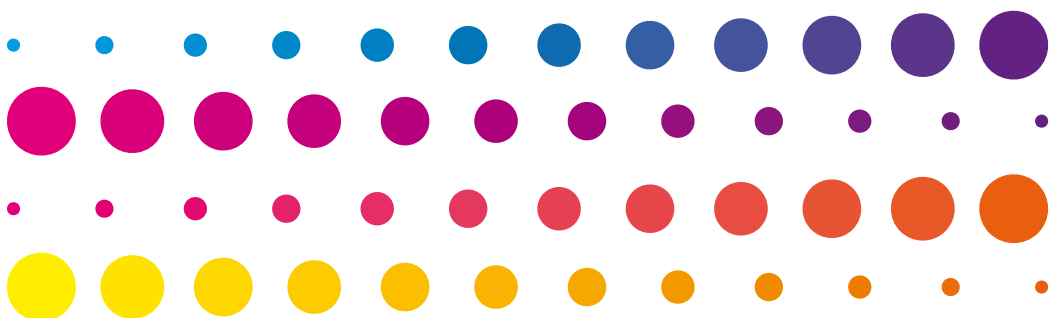




Specialist Schools
and Academies Trust
THE SCHOOLS NETWORK™

Leading system redesign – 1

David H Hargreaves
October 2008



Leading system redesign – 1

Author

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Mission of the Specialist Schools and Academies Trust

The Specialist Schools and Academies Trust works to give practical support to the transformation of secondary education in England by building and enabling a world-class network of innovative, high performing secondary schools in partnership with business and the wider community.

THIS PUBLICATION

Audience

Educational practitioners at all levels.

Aims

To demonstrate how 'Wikipedia world' (web 2.0) presents opportunities for transforming the goals of system redesign in education; the means by which they might be realised; the kinds of leadership that will be required; and the forms of governance under which it will flourish.

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1 Introduction

This second series of pamphlets on system redesign, like the first series, charts the way forward in system redesign at both the conceptual and the practical levels. This first pamphlet is largely conceptual in its treatment of system redesign. Its aim is to show that system redesign will need to be yet more ambitious if it is to achieve its aim of educational transformation. It points to the opportunities that are becoming available but will not be deployed without changes in how we define leadership and put it into operation in schools. This means that the challenges to leaders at every level in the education service are now unusually exacting. The pamphlet is concerned with the nature of the challenges and the general direction of the ways by which they can be met.

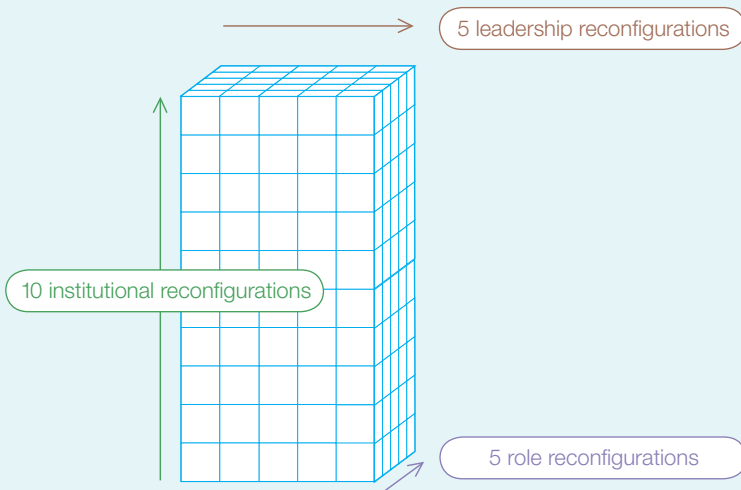
The next two pamphlets in the series, *Leading system redesign – 2: the changing profession* and *Leading system redesign – 3: the students*, deal with how leadership roles and responsibilities are already changing at school level in line with the direction of travel outlined in this pamphlet. It goes beyond what has hitherto been treated as distributed leadership.

But leadership is undoubtedly the key. In *System Redesign – 1*, the building blocks of system redesign were described in terms of 20 reconfigurations in three sets – 10 institutional reconfigurations, five role reconfigurations and five leadership reconfigurations. It is usually the set of institutional reconfigurations, not the role or leadership sets, that capture the immediate imagination of most of the teachers with whom I have discussed system redesign.

This is, I think, because among the institutional reconfigurations are some startling potential changes to 20th century schooling: the end of the autonomous school, stage not age and the disappearance of year groups, reworking of the academic-pastoral divide, new designs for buildings and learning spaces. These have an instant appeal – or challenge – that is missing from talk about leadership. Yet system redesign demands a rethink about leadership without which the pace and depth of system redesign will be severely restricted. This is the motive behind a second series of pamphlets.

The architecture of system redesign can be represented as a three-dimensional box (figure 1). The inside can be divided into 250 (10 x 5 x 5) small cells that represent the interactions between the three dimensions. As an example, the cell in the top left hand corner represents the interaction between the first institutional reconfiguration (the move from the autonomous school to multiple institutions), the first role reconfiguration (co-construction between stakeholders), and the first leadership reconfiguration (flatter staff structures). In other words, for a school embarking on the move from a single, autonomous school into a hard federation of several schools, there will be an interaction between that (institutional) change and associated changes in how the federation is to be co-constructed between the parties involved (roles) and how staff structures will change (leadership).

Figure 1: The 20 reconfigurations of system redesign



In system redesign of any individual school, some of these 250 cells are likely to be more important than others. Some will be more difficult to achieve than others. In principle, it is possible to use the cube to show how each school is likely to have a unique combination of cells that it regards as crucial to its own redesign – for not all cells can be given the same importance at any one time. It will not be easy to analyse how, in setting about system redesign, different schools *select* different combinations of cells and *sequence* them in different ways. These processes of selecting and sequencing are the strategies system redesigners use to achieve maximum complementarity.

In this series of pamphlets we seek to demonstrate that of the three dimensions to the reconfigurations, it is the leadership set that is the most critical. Without the right leadership, system redesign will fail. So understanding how and why the leadership reconfigurations drive system redesign is an urgent task. This will entail an enquiry into some of the recent developments in the internet and the creation of what is called web 2.0. If you are unfamiliar with some of the language used about the new technologies and the internet, you can always consult 'jargon buster' at <http://en.teachtoday.eu/home/>

2 The knowledge revolution

In March 2000 Jimmy Wales and Larry Sanger launched Nupedia, the name they gave to their online encyclopaedia that, unlike Encyclopaedia Britannica, would be non-proprietary and so freely distributable.

Nine months later, in November, Nupedia had just two completed articles. To ensure quality control, a voluntary advisory board had been established to devise an editorial policy for commissioning, reviewing and revising drafts of articles before eventual publication. Within one year from launch, Nupedia had just a dozen completed articles. Experts move very, very slowly – as anyone involved in academic publishing through peer review knows only too well.

In January 2001 Wales heard about the notion of a wiki, created by Ward Cunningham in 1995. A wiki is a user-editable website. Each page has a button that allows any reader to edit, by addition, deletion or alteration, the content of the page. But it can also preserve the previous text before it was edited and thus store the history of the document. The new idea, then, was to create an encyclopaedia based on wikis, so that users could generate and edit articles, starting with a 'stub' or embryonic article. The Nupedia board of experts objected very strongly. But within a few weeks the newly created Wikipedia had massively increased its content. The very first article was posted on 16 January 2001; by 12 February there were 1000 articles, then over 10,000 by September, and 40,000 a year later.

Nupedia, by contrast, had only 25 completed articles when it closed down. In Wikipedia, a process of self-correction and extension through voluntary editors drove rapid development, so that articles increased not only in number and length, but also in accuracy and style. Today there are over 2.25 million articles in English, and worldwide over 9 million in 253 languages. Wikipedia servers respond to approximately 30,000 requests per second, or about 2.5 billion per day. For many, it's their first point of reference when they need knowledge fast.

But could Wikipedia live up to the challenge of the well-established and universally known Encyclopaedia Britannica? In checks of accuracy, Wikipedia does pretty much as well as Encyclopaedia Britannica. But it has advantages over Encyclopaedia Britannica in its much greater ease of access, and in that when an error is discovered it can be corrected much more quickly and easily. Even more importantly, new material can be added more quickly and easily. For example, in the case of the London 7/7 bombings, someone created a Wikipedia page, of just five sentences, within minutes of the bombs going off. And in the next four hours more than a thousand edits were made as the disaster and knowledge about it unfolded.

Of course the problems of control over content remained. There have to be some rules. For example, rules against editing your own biography and creating new pages anonymously. There were in fact two big problems. The first was the work of vandals, who edited or deleted worthwhile text and replaced it with rubbish. This problem has been solved, since most vandalism is stopped quite quickly, often within hours of its commission. The people who write or use Wikipedia police their community fiercely. A few articles that are subject to extensive, regular vandalism are locked.

The second control problem is what is admissible content. There has been a system for removing extremely trivial submissions, but the line between the serious and trivial is inevitably arbitrary. Some would like to restrict Wikipedia content to matters that are serious or notable; others think that any item, however trivial, is worth including if that is what people want to contribute. Battle rages between these two groups, the 'inclusionists' and the 'deletionists'. It is not yet clear how this conflict will be resolved, since there is no single person or body with the undisputed power and authority to impose a solution.

Wikipedia works because of several factors.

- It has thousands of contributors, most of whom make very small edits. Contributors do not have to know everything about a subject. Just knowing one small bit of information can allow one to add to an existing article. Each contributor gets instant recognition as the text changes before one's eyes.
- People are more motivated to make a small contribution to an existing article than to attempt a whole article on their own. Wales encouraged contributions by saying to folk: 'Humour me. Go there and add a little article. It will take all of 5 or 10 minutes.' Contributors get the satisfaction of being a collaborator in something hugely beyond the powers of an individual or group.
- There is an opportunity for controversies over content to be discussed. It is not controlled from the centre, in a top-down way. Contributors do not have to seek permission to start or edit a contribution. So articles get better over time through constant scrutiny and emendation. Sanger himself ran into trouble however, when he took to himself rights to control the content by deleting content of which he did not approve. This did not go down well and he soon left.
- The demand on Wikipedia's overheads is very small indeed. It works because so many people do the work for nothing.

So, a fascinating story: but what has Wikipedia, perhaps the best-known and most vivid illustration of what is known as ‘user-generated content’ and web 2.0, to do with the system redesign of schooling and its leadership? The answer is that Wikipedia, when compared with Encyclopaedia Britannica, represents a revolution in the way knowledge can be created, collated and distributed. This revolution will transform how we respond to the media, the nature of social organisations and leadership, and the very way in which we relate to one another. And it is all happening very fast.

The Wikipedia revolution will potentially have a deep influence on the design of schooling and how system redesign is to be led. It already has an impact on schooling in that students have instant access to the Wikipedia world by touching the keys on their computer, at home or school. To most educators this has spawned the immediate problem of plagiarism, students copying and pasting extracts from such documents into their assignments and passing it off as their own work. Student use of Wikipedia is even being banned in some places. Wikipedia may indeed present problems in schools, but that is not our concern here. Wikipedia world and developments on the internet raise many contentious issues, such as whether young people are spending too much time on their computers, whether the information young people access is accurate or wholesome, whether social networking broadens their social worlds or is just more time with a restricted group of chums, and so on. These are important issues for educators, but they are not relevant to the argument presented here.

Wikipedia is the star of this chapter not for what it is, but for the remarkable story of how it came into being, for how it symbolises some profound changes in society, and for the portents it bears of what may lie ahead. Jimmy Wales was asked to say how Wikipedia works and to describe his role in it. This is his reply:

Nupedia was a failed model, but one thing it did do for us was create a strong community that got Wikipedia off to a good, strong start. I spend a ton of time writing emails internally, to the community, touching base with people, discussing issues that come up. I do engage with people on policy matters and try to settle disputes. But there's no schedule, there's no direction for these people at all. Nobody's the boss of anyone. People just pick up projects and work on them. They remotely log into servers to work on them when they need maintenance. They reconfigure the networks when they need reconfiguring. It's all done completely will-nilly, I mean with no organisation at all. And yes, it works.

I suspect that some of the new executive heads and principals may see here a hint of their new role after conventional headship. But could this conceivably be of a reconfigured headteacher, or even an education minister? To our frenetic, micro-managing ministers with their an-initiative-a-day agenda or to frantic, overworked headteachers with so little time for reflection and relaxation, this may seem no more than an absurd, wild dream. But system redesign in education began with similar recognition of a failed model and the determination to replace it with something better.

What I call 'Wikipedia world' presents opportunities for transforming

- the goals of system redesign in education;
- the means by which these goals might be realised;
- the kinds of leadership that will be required;
- the forms of governance under which it will flourish.

I must now justify these claims.

3 The evolution of system redesign

In the work schools have undertaken in association with SSAT in the learning journey from early steps in personalisation (Autumn 2004), through work on 'the deeps' (Spring 2006), to system redesign (Autumn 2007), the idea of innovation networks has always been central.

From the beginning, SSAT in close alliance with John Dunford and what was then the Secondary Heads Association (now Association of School and College Leaders), argued with schools minister David Miliband that the way forward was not by means of a centralised national strategy for personalising learning. Rather, it would be through the profession taking on the responsibility for devising and implementing what personalisation could offer to the task of improving teaching and learning. Through a variety of means – conferences, seminars, think-tanks, development and research networks, pamphlets – the aim has been to stimulate innovation, to devise ways of doing things differently in school in order to do them better. The networks have served a double function: bringing schools into partnership to co-construct innovation; and allowing the knowledge transfer by which emerging practice is disseminated to others.

The new technologies have played a relatively small part in these networks. Yet the internet and the worldwide web are potentially a huge resource to educational innovation networks, simply because, in the words of David Weinberger, they form

...the most complex network ever created. It is by many orders of magnitude the largest collection of human writings and works in history. It is far more robust than networks far smaller, yet it was created without managers. In fact, it succeeded only because its designers made the conscious decision to build a network that would require no central control. You don't need anyone's permission to join in, to post whatever you want, to read what others have posted. The web is profoundly unmanaged, and that is crucial to its success. It takes traditional command and control structures and busts them up into many small pieces that then loosely join themselves – and that too is crucial to its success... The web will have its deepest effect as an idea. Ideas don't explode; they subvert. They take their time... After a while someone notices that we're not thinking about things the way our parents did.

SSAT's innovation networks are themselves largely unmanaged, for there is no centralised command-and-control structure. Conferences and seminars are open events: they depend on school leaders for presentations and for attendance. If school leaders do not volunteer as presenters or delegates, nothing happens, since most events must be self-financing. The personalising learning journey has been successful only because school leaders made it so. There is, it seems, a kind of parallel between the way we have come to system redesign and the way the web works. Yet the two have not thus far been closely linked. System redesign has seemingly not needed, nor even seen the rich potential of, the web. Or at least not until now.

For the web is changing, and changing fast as it evolves from web 1.0, the one we are all familiar with, into web 2.0. This is the name that is being given, not so much to technical advances, but to the way web technology and design enhance creativity, collaboration and sharing. As we shall see, it is the young who have been most rapidly recruited to web 2.0; most adults are as yet barely aware of its existence. Wikipedia became viable when the possibilities we now summarise in the term web 2.0 arrived. Many adults use some of the *products* of web 2.0, such as Wikipedia, and will do so increasingly. But they are of a generation more likely to be laggards rather than lead users in the *processes* of web 2.0.

Web 2.0 changes the way people use the web. So there is a growing speculation and philosophising about the character of the web and how it might affect us and help us. One of the best thinkers in this regard is Yochai Benkler, from Harvard, in his book *The wealth of networks*, published in 2006. Benkler is convinced about the radical potential of the web in creating what he calls *the networked information economy*.

The most important aspect of the networked information economy is the possibility it opens for reversing the control focus of the industrial economy... Emerging models of information and cultural production, radically decentralised and based on emergent patterns of co-operation and sharing... are beginning to take an ever-larger role in how we produce meaning – information, knowledge and culture.... The networked environment makes possible a new modality of organising production: radically decentralised, collaborative and non-proprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who co-operate with one another without relying on either market signals or managerial commands. This is what I call ‘commons-based peer production’.

It is one thing for schools and their leaders to take on the task of driving the agenda on personalising learning at a time when so much education policy has been of the top-down, command-and-control variety. It is quite another matter to assert, as Benkler does, that we are on the edge of a profound change in the way we produce knowledge and culture, one by which the world is divided into the small number who are *producers* of culture and knowledge for the vast majority who are relatively passive *consumers* of that culture and knowledge which they buy from the producers.

The emerging pattern of cultural production in Wikipedia world is decentralised, and cultural products are the outcome of widely distributed collaborators. Peers work together and offer their products free or at cost price to anyone who wants them. This is, of course, exactly what school leaders have been doing with personalising learning for the last four years. The difference is that most of their collaboration, and much of the product of that collaboration, has not been achieved through web 1.0 let alone 2.0.

Let us pursue the difference between web 1.0 and 2.0. Benkler's argument is that hitherto the mass media have followed the conventional distinction between producers and consumers. The products of the mass media are presented to consumers as finished products on a 'take it or leave it' basis. Even where consumers are invited to participate, it is either at a minimal level, eg voting by telephone in relation to a TV programme, or being one of the tiny number of listeners invited to speak on a radio programme. But that, says Benkler, is going to change. The internet will mean a transformation from a public sphere that is constructed on finished statements from the producers to one that becomes more like a conversation, because many more people can be involved. Mass media will rely less on the production of finished statements and more on *invitations to a conversation*. As Benkler puts it, there is a 'shift from the hub-and-spoke architecture with unidirectional links to end points... to distributed architecture with multidirectional connections among all nodes in the networked information environment.'

The move from 'finished statements' to 'invitations to a conversation' has been a central plank in the work on personalising learning, as is shown in the development of student voice and the emerging central concept of co-construction. Benkler's book suggests this has much further to go and will transform social relationships, personal identities and the very nature of democratic societies.

Clay Shirky (2008) also foresees deep changes in social organisation. He argues that

the new technology enables a new kind of group-forming. The transfer of these capabilities from the various professional classes to the general public is epochal, built on what Tim O'Reilly calls 'an architecture of participation'.... We now have communications tools that are flexible enough to match our social capabilities, and we are witnessing new ways of coordinating action that take advantage of that change.... By making it easier for groups to self-assemble and for individuals to contribute to group effort without requiring formal management... these tools have radically altered the old limits on the size, sophistication and scope of unsupervised effort.... The current change, in one sentence, is this: most of the barriers to group action have collapsed, and without those barriers, we are free to explore new ways of gathering together and getting things done.... Now that there is competition to traditional institutional forms for getting things done, those institutions will continue to exist, but their purchase on modern life will weaken as novel alternatives for group action arise.

In other words, new forms of decentralised collaboration are emerging that could transform knowledge creation and transfer in education that were not understood when we began in 2004.

Schools may not be among the first to grasp the potential of what Shirky foresees. Home schoolers might be. Their movement has been growing rapidly. The early pioneers risked keeping their children in the isolation of the home and access to relevant resources and knowledge was limited. Internet developments have changed all that. In Wikipedia world, access to knowledge resources is far less of a problem and there is a new and unexpected ease of networking with fellow home schoolers and others. Web 2.0 offers an unexpected and almost cost-free boost to home schooling. The possibilities of many young people spending half their time home-schooling and wanting only part-time access to school services is likely to grow. Part-time study in universities is ubiquitous and unremarkable – and ideal for many learners. Will the same happen for students of school age in Wikipedia world?

Nevertheless, Wikipedia world poses some dramatic questions for those in schools.

- How much further will these developments go in education as part of system redesign?
- Will school leaders recognise the potential and exploit it in the interests of system redesign?
- What action is needed to push forward this development?
- Who will take the lead?
- What will be the effect of such action on relationships within and between schools?
- How will central and local government respond?
- How will both schools and government be affected by the deeper changes in society that Benkler and Shirky describe, and how soon will that external influence be felt in schools?

System redesign and web 2.0 are co-evolving. They may be allowed to grow further apart on their own trajectories or they may evolve in parallel with mutual support. The fate of system redesign rests with school leaders and with government – and their willingness and capacity to foster this co-evolution.

Are both parties indeed willing and able?

4 System redesign 2.0 and generation Y

System redesign is set to become a complex fusion of the lessons learned from mass customisation and from the new form of peer production and innovation created by the ways of working in Wikipedia world. What, then, are the challenges for the leadership in education?

There are two potential barriers to realising the full potential of Wikipedia world to transform education through system redesign. They are the leaders of education in schools and the leaders of education in central and local government. In this chapter we consider leaders of education in schools.

It is, of course, school leaders who have forged the path from personalising learning to system redesign. How, then, could they possibly be potential barriers to the next stage of system redesign?

That they have indeed been leaders of system redesign marks them out as unusual leaders. They have been innovators and risk-takers; they have sometimes ignored pressures to conform to central and local government policies that did not command their respect; they have been enthusiasts for sharing their experience with other school leaders.

As such, they tend to be mavericks, independent minded non-conformists. Certainly they are outward looking and generous, but they are not always the easiest people with whom to collaborate. Strong leaders do not easily exhibit an inclination towards, or deep capacity for, the followership that collaboration requires.

More importantly, they are of the wrong generation to be devoted users of the internet and the web. They are busy people who do not have the time to pick up the necessary skills and experience. Indeed, they often have personal assistants who undertake this work for them. It is not unknown for these assistants to print out emails for them to read and respond to! If they get on their PCs, they are more likely to be 'surfing' – passively reading, watching, listening – than 'peering' – sharing, socialising, collaborating, creating. Peering is what a younger generation does. Unlike their elders, many of the young are more at home in web 2.0 than web 1.0.

What exactly does this mean?

The web is evolving from a network of websites that enable firms to present information...into a computing platform in its own right.... The internet is becoming a giant computer that every one can program, providing an infrastructure for creativity, participation, sharing and self-organisation.

And as a result such changes

are ushering us towards a world where knowledge, power and productive capability will be more dispersed than at any time in our history – a world where value creation will be fast, fluid and persistently disruptive. A world where only the connected will survive. A power shift is underway and a tough new business rule is emerging: harness the new collaboration or perish.

So write Don Tapscott and Anthony Williams in their bestselling *Wikinomics: how mass collaboration changes everything* (2007). We learned lessons for personalising learning from the experience in the business world of mass customisation. It is now time to learn from what happens in business as a result of web 2.0.

The old static web that one surfed is now changing into the programmable web through which groups and businesses are co-creating new services, experiences and communities.

For web 2.0

- allows more people to do things for themselves by themselves – and this must include teachers and students;
- increases the capacity of networks to achieve more without the old hierarchies of power and control;
- changes the structure and culture of formal organisations if they are to capitalise on the above two features.

In Benkler's words:

As with other purposeful, peer-produced projects like Wikipedia, the basic characteristics of the internet... have made it possible for anyone, anywhere, for any reason to begin to contribute to an accretion of conversation...[and] these conversations can persist across time and exist across distance, and are available for both active participation and passive reading by many people in many places.

As a result, the ways in which people organise themselves, informally as well as formally, cannot remain unaffected. Indeed, in schools we can expect as a central feature of school redesign to see a severe blurring of the traditional boundary between the formal and the informal.

Properly harnessed for the redesign of schools, these changes:

- will hugely expand and support a range of peer production models among teachers and students;
- support and develop further the practice of 'learning conversations' among all a school's stakeholders as a means of knowledge creation and transfer;
- sustain a culture that is akin to that of 'open source';
- increase the pace and depth of transformation through system redesign.

Current school leaders, especially well-established headteachers and principals, may understand *that* web 2.0 has much to offer to system redesign. But will they be the people who understand *how* to harness these changes and bend them to meet educational challenges?

Wise school leaders will, I believe, acknowledge their limitations in Wikipedia world and web 2.0 and so turn to generation Y – the people who were born after 1980. As far as schools are concerned, generation Y includes *all* the students but just some, usually a minority, of the staff, and very few of the parents of secondary school students. Many of these under-thirties have regular experience of blogs and wikis and an intimate familiarity with names such as Facebook (with its 80 million users), MySpace, Bebo, Piczo, hi5, Xanga, YouTube, flickr, Eyeballchat, tribe, Second Life, LiveJournal, digg, etc. To many of their elders, the babyboomers generation (born between 1946 and 1965) and even some of generation X (born between 1965 and 1982), these are barely recognisable names.

According to a recent IPPR report, three quarters of children have visited a social networking site. How many of generation X have done so? Instant messaging is similarly far more common among young people. There were just a few dozen blogs at the start of 1999: in less than two years there were 100 million. Most of these passed generation X by. At a recent conference of school leaders I could find nobody who could define a wiki – though some had used Wikipedia.

Of course, not all generation Y people fit this image of web 2.0 sophistication; nor are all generation X school leaders so ignorant. But there is an age gap. The generational difference is particularly striking for school-age generation Y. The overall trend in TV viewing is in slow decline, but there are huge differences by age group. Decline in viewing is most marked among 16-24 year olds, down to 2.5 hours per day from 2.7 hours in 2003. (The average for all age groups is 3.6 hours.) A survey by Childwise gives similar figures for 2007: boys spend on average 2.7 hours watching TV per day, and girls 2.6 hours. However, boys are online for an average of 1.9 hours a day, and girls 2.1 hours.

Eighty per cent of 5-16 year olds have access to the internet at home. But whereas about the same percentage of young people have a TV in their bedroom – where else do we dump our old televisions? – far fewer have internet access in the bedroom (estimates vary between 13 and 25 per cent). What will happen when *all* in this age group have internet access from their bedroom? My guess is that the time young people spend watching TV will decline further and time online will increase.

The gap between the generations will grow – yet another digital divide. It is not simply that older people are behind the young in their technical knowledge and skill with the new technologies: it is that aspects of relationships, communications and social identities are pervasively affected by the new technologies. Moreover, new barriers between the generations are being erected in web 2.0. David Crow talks about the Facebook generation, aged between 16 and 25, who

are the first to take technology for granted and are at the forefront of the web 2.0 revolution. As customers, they will not be dictated to; they are the children of choice and they have an unshakeable belief that they know best. Not for them any of generation X's doubts and uncertainties. With this self-assurance comes a lack of deference. The Facebook generation ignores expert opinions and instead turns to one another for advice and recommendations. Fiercely tribal, they largely shun traditional media.

Facebook is rather like an internet within an internet. Members write to each other within the system and have no need to use ordinary email or texting. Since advertisers are now allowed to sell their products through Facebook, members can spend much of their online lives there. Indeed, this is the object and what makes Facebook worth its weight in gold.

To generation X and babyboomers all this may look like a rerun of 1960s talk of 'teenage culture' and 'the adolescent society' cut off from their elders. Perhaps you think the contentions made about 'the Facebook generation' are an exaggeration. But are you sure?

For so many of generation Y, web 2.0 and its rapid development are simply natural parts of life that grow alongside one. What will web 3.0 be like? (Yes, look it up in Wikipedia.) The young certainly lack both the fear and the awe that many generation X and babyboomers have of these technologies. As Clay Shirky puts it: 'It's when a technology becomes normal, then ubiquitous, and finally so pervasive as to be invisible, that really profound changes happen, and for young people today, our new social tools have passed normal, are heading to ubiquitous, and invisible is coming.'

Nor is this just a British phenomenon. There are more mobile phone users in China than in USA, Japan, Germany and Britain combined. More than 70 per cent of Chinese internet users are under age 30. How soon will it be before generation Y people living in different countries and speaking different languages find it easier in some ways to communicate with one another than with their own elders?

So it is our generation Y, both younger staff and students, who need to harness the power of web 2.0 in the interests of improving teaching and learning and foster the innovation networks that this goal entails. The task for senior leaders is to invest in them the necessary authority, time and resources to flourish in Wikipedia world and get on with the job.

Will school leaders do it?

5 The empire strikes back

Wikipedia world and web 2.0 threaten many individuals and institutions that currently wield power and influence. They are not taking it lying down. Back in 2002, Lawrence Lessig warned that 'we are far enough along to see the future we have chosen. In that future counter-revolution prevails. The forces that the original internet threatened to transform are well on the way to transforming the internet.'

For Lessig, the internet is a 'commons', that is, a resource held in common and free for use by the community. But it is a special kind of commons, an *innovation* commons. Free resources have always been critical to innovation, creativity and democracy. And the internet provides materials and digital tools that dramatically increase both the potential for innovation and the accessibility of people to those tools and materials.

Web 1.0 gave producers access to vastly increased markets: life was good for producers. When, as is happening with web 2.0, the consumers threaten to become producers, many producers strike back. They use their power and resources to control access to materials and tools, to the new ways of sharing and distributing, by invoking copyright and other ways of maintaining the status quo. Some of the most contested terrain has been in the area in which generation Y are deeply immersed: popular music.

Without access to the new resources, says Lessig, creativity will be crippled. In the digital age the issue is not whether the market or government should control a resource, but whether these resources should be controlled at all. So for Lessig there are important moral questions about what rules should govern the freedom to innovate; but more importantly there is a constitutional question about the values that define the society we live in.

In education, a parallel set of questions arises. Who controls the innovation agenda in education? What scope is there for the creativity of teachers and students? What could and should be different in Wikipedia world as web 2.0 develops?

The worrying truth is that officially the potential for innovation at school level has been in decline for some years. In part this is because so many of the bread and butter issues of schooling, the core matters of curriculum and assessment, have been heavily constrained by the national curriculum and its associated assessment regime. In part it is because teachers enjoy relatively few resources (time, money) for innovative work. But most of all it is because government assumes that it should have control of the innovation agenda. That is why we have:

- national strategies for teaching and learning;
- a constant stream of directives and initiatives based on ministerial thinking about what new ideas and practices should be introduced;
- an innovation unit funded and controlled from the centre, which for most of its life was located in ministry buildings.

When I worked in the DfES (as the education ministry was called in 2002), I tried to persuade a minister of the desperate need to invest in innovation by teachers. My vision of the innovation unit was one that would be led by seconded headteachers working with experienced innovators from business and industry, located well away from ministers so that real risks could be taken without political backwash. It was not to be. As the minister said to me, 'But what if the headteachers don't want to innovate on the right things?' – the right things, of course, being those on his agenda, not that of schools.

And yet, in my experience, innovation is flourishing in some schools, often quietly, without fuss, but with the excited commitment of the teachers, students and others who are involved. It is such schools that imaginatively addressed the challenges of personalising learning and that have gained in innovative confidence as they moved to system redesign.

The new challenge to these innovation stars is whether they can take the next crucial step. That is, empowering generation Y teachers and students to exploit all the potential of Wikipedia world for the improvement of teaching and learning, with any necessary system redesign that this might entail. And my suspicion is that it may require more radical system redesign than we now imagine, especially if this is all linked to Building Schools for the Future. We need schools that will be receptive to Wikipedia world and will wholeheartedly welcome the rapid development of web 2.0 and beyond.

This is what system redesign 2.0 must achieve. Is central government going to be a help or a hindrance to this task?

6 Governance for system redesign 2.0

Central government has three options.

- It can resist system redesign 2.0 in education.
- It can ignore school-led work on system redesign 2.0, either because it thinks it insufficiently important or because a 'wait and see' strategy seems sensible.
- It can actively support system redesign 2.0 and make the changes that are needed to enable it to flourish.

At present, the second option seems the most likely. Dialogue with government about the issues is therefore very important.

The difficulty is that government has deployed command-and-control strategies in education for so long that it now does so by ingrained habit. The result is that even when it has good policies, it wants to control and even micromanage their design and implementation. So the government fosters diversity among schools, but is keen to restrict it to an approved menu. It rightly says innovation is needed, but sees itself threatened by an innovation that is not part of its own agenda; other agendas are assumed to be detrimental, when they might in fact be complementary. It deploys the rhetoric of school-led innovation, but the current assessment regime and fear of sliding down the league tables has created a risk-averse climate where so many headteachers feel it prudent to play safe. It properly proclaims the need for transformation, but mainly so it can further its own narrow version of 'the standards agenda'. The government sensibly encourages collaboration between schools, as long as they collaborate to advance government policies. It invests generously in ICT in schools, but then worries about the evidence whether this expenditure is helping to raise key stage test and GCSE results.

Government fails to see the link between these various elements – diversity, innovation, collaboration, new technologies – and so does not realise that the transformational potential lies in the *interaction at school level* of these elements, which government can only stimulate, not direct. This is in part because these elements are in different policy silos; in part because government pays too little attention to the positive deep changes in society – as opposed to changes that worry voters – so it misses the deep changes in education and the need to connect the two; but most of all because government sees itself as the transformer of schools, but never acknowledges that, as part of this process, government has itself to be transformed too. It cannot let go; it does not understand that in Wikipedia world innovation is inhibited, not unleashed, by top-down control.

Government has not responded well to criticism of its top-down approach from the teaching profession and other stakeholders in education. As Brafman and Beckstrom put it: 'When attacked, centralised organisations tend to become even more centralised. They hunker down. The strategy works for research labs, but how about for a business? Or an entire country for that matter?'

During most of Tony Blair's premiership, Geoff Mulgan was head of strategy at Number 10. When he left, he concluded that:

Dynamic governments remain porous. Renewal rarely comes from within. One of the optical illusions of government is that those inside of it think of themselves as the drivers of change.... Yet most far-reaching ideas and changes come from outside.... Governments are more often vehicles than initiators. They play a role in embedding these changes but typically they get involved only at a late stage.... The smarter governments around the world realise that they need to build innovation into their everyday working: through experimental zones and pilots, competitive funds and rewards for promising ideas. And new ideas need time to evolve – preferably away from the spotlight.... Most radical change has to start outside government, usually from the bottom rather than the top.

It is a powerful statement for it is evident that this is not at all how education policy, during the Blair years and after, has been devised and implemented; and yet it provides a clear prospectus for what education policy could be. If this were to become government education policy, system redesign would be actively encouraged and supported by the ministers who now ignore it. If Mulgan can chart the better way to transformation, will others come to see the light too?

This might happen because something similar is happening in the business world. Tapscott & Williams observe that

While hierarchies are not vanishing, profound changes in the nature of technology, demographics, and the global economy are giving rise to powerful new models of production based on community, collaboration, and self-organisation rather than on hierarchy and control.... Millions... now use blogs, wikis, chat rooms and personal broadcasting to add their voices to the vociferous stream of dialogue and debate.... Employees drive performance by collaborating with peers across organisational boundaries.... Customers become 'prosumers' by co-creating goods and services.... Smart companies are encouraging, rather than fighting...

Thus it is that IBM, powerful a giant as it is, decided to treat Linux and open source not as a threat but as a collaborative partner.

Smart companies need agility and have to move fast if they are to thrive. Government knows this, so never dreams of micro-managing business. Curbing its tendency to micro-manage the education system does not mean abdicating its responsibilities. Government does have a duty to determine the basic design features of the education services provided by schools – funding, selection, admissions, qualifications, and so on. It is headteachers and principals of schools who should take the lead on innovation and be responsible for the innovation networks that will engage in the necessary knowledge creation and transfer. They are the people to deal with the detail. Government is the right body to see and paint the bigger picture. Government, in short, should be the integrator and orchestrator of system redesign 2.0.

Eric Raymond famously captured the impact of the open source movement on the new technologies by contrasting the way one builds a cathedral and operates a bazaar. A cathedral is designed according to a master plan, and is erected when the craftsmen studiously execute the design that is handed to them. There is little room for innovation, except in the odd gargoyle or two. A bazaar is packed with individuals doing their own creative thing, adapting themselves to the circumstances of the time and what is working best. But there is order in what superficially looks like chaos; all who participate get their business done, both buyers and sellers, with a minimum of supervision. In the field of the new technologies, Raymond argued, it is the switch from the cathedral to the bazaar that has unleashed Wikipedia world. In its education policy, the government is still trying to build a cathedral, with school leaders as the craftsmen. School-led system redesign needs a bazaar if it is to thrive.

System redesign works best when education's leaders, at government level and at school level, are willing to redesign their roles, responsibilities and relationships with one another. For system redesign 2.0 to succeed, redesigning the designers is critical, not merely desirable. Things will look very different. As Tapscott and Williams put it, 'The end result might look more like a Jackson Pollock painting than a traditional organisational flow chart, but this much more granular and collaborative division of labour will enable a more flexible and fluid approach to innovation.'

The questions are: how might we get there? And, exactly where is 'there'?

7 The evolution of system redesign 2.0

It is a platitude to say that the future is uncertain and that making predictions is a hazardous business. But part of what makes leaders effective is their capacity to create a clearer than average vision of the future and to do as much as possible to prepare for that envisioned future, while retaining an ability to adapt to whatever fate discloses.

Wikipedia world and web 2.0 will evolve very fast. Even the most brilliant insiders in the world of the new technologies are cautious about making predictions, but they all believe that rapid development is guaranteed. System redesign in education will also evolve in response to technological advances and other deep changes in the external environment. We cannot say where it will all go, but we can say that the task of system leaders is to understand the process of evolution and so be better armed for the future as it unfolds.

In this chapter I want to illuminate the evolution of system redesign by means of a very rough analogy with biological evolution. The object of this analogy is simply to sharpen thinking about the leadership of system redesign 2.0.

'The history of life,' said the late Stephen Jay Gould in *Wonderful life*, a study of the Cambrian explosion and the Burgess Shale discovered in British Columbia in 1909, 'is not a continuum of development, but a record punctuated by brief, sometimes geologically instantaneous, episodes of mass extinction and subsequent diversification.' This is the essence of Gould and Eldrige's theory of *punctuated equilibrium*.

Gould draws on the distinction between diversity and disparity. *Diversity* refers to the number of distinct species in a group. There are more than 15,000 species of rodents, so their diversity is high. Diversity among horses is low – fewer than 10 species (donkeys, zebras, kiangs etc). *Disparity* refers to anatomical or body plans. Nearly 80 per cent of all living species are arthropods (mainly insects), with high diversity; but the range of body plans is small, all being built according to the same general anatomical pattern despite huge variations in size, colour, etc – so disparity is small.

According to punctuated equilibrium theory, then, extinction does not arise evenly through time. Rather, time is punctuated by occasional mass extinctions, which occur because some event disrupts the environment so catastrophically that many, even most, species fail to survive. A mass extinction 570 million years ago preceded the Cambrian explosion whose fossil record is in the Burgess Shale. Another mass extinction, 225 million years ago, rendered 96 per cent of all marine species extinct. The best-known mass extinction occurred 65 million years ago. The dinosaurs were well adapted to their environment with high diversity, but when that environment changed radically, their low disparity led to their disappearance. It is this mass extinction in the late Cretaceous period that opened the door for the extensive evolution of larger mammals, and eventually human beings.

Biological organisms and social institutions evolve, though in different ways, of course. Schools have evolved, but they are marked by low disparity as well as low diversity. In other words, there is a history of limited diversity among schools, but they have essentially the same body plan. This common anatomy is what makes them recognisable as belonging to the same species of institutions we call schools. Over the years, governments have sought to increase diversity – creating comprehensive schools rather than grammar schools, grant-maintained schools rather than LEA schools, academies rather than comprehensives, and so on.

In *Personalising Learning* – 6, it was pointed out that evolution in social institutions tends to what sociologists call *isomorphism*, the susceptibility of institutions like schools and hospitals to become more alike, not less, over time. The low disparity of 20th-century schools is danger enough, but more so because it also hinders an increase in diversity. Despite regular government attempts to *diversify* schools – including the recent invention of academies – overall *disparity* has remained persistently low, unaffected by political tinkering with diversity. Schools are very much still schools. (Go into a school and you know where you are: it's highly unlikely you'll think you are in a hospital!) This is, of course, unproblematic as long as the external environment remains broadly stable.

A physicist who became an education officer and then a leading thinker and academic in the field of organisational development, the late Reg Revans asserted that 'For an organisation to survive, its rate of learning must be at least equal to the rate of change in the external environment.'

What I call Revans's law, with its evolutionary flavour, provokes three questions.

- Who would dispute that for people working in education the external environment of the school is changing fast and that change is accelerating?
- Who would dispute that the rate of organisational learning for most schools is far from being at least equal to the rate of external change?
- Who would dispute that schools' rate of learning needs support from government policy and that it could, by policy changes, actually support a faster rate of learning?

Revans's law suggests that schools are heading for trouble as the rate of change in the external environment accelerates. But the danger looms ever larger if we add the insights from punctuated equilibrium theory. For a school system handicapped by low diversity and disparity, the rapid rate of external change is potentially catastrophic. Low disparity means that there will be few or even none with the capacity to survive catastrophe, so the threat of extinction is real. Some school leaders are already convinced that the factory model of schooling, which is still alive and well but increasingly beyond easy adaptation to a changing world, is a dinosaur whose extinction is nigh.

But what in Wikipedia world might survive a mass extinction of current forms of schooling?

One of the differences between institutional and biological evolution is that the way institutions evolve is easier to manipulate. An insight we might draw from our loose biological analogy is that a prudent investment would be to do everything possible to make a substantial investment in increasing disparity as well as diversity. We need to generate models of schooling with many different kinds of anatomy – different ways of teaching and learning; different cultures and structures; different forms of governance; different buildings and use of space. Whatever the benefits of establishing academies might be, they extend diversity to a modest degree, but make no more than a minute contribution to added disparity. (That is, unless the leaders of academies choose, as some of them are doing, to use their diversity as an ingenious springboard to disparity.) We need more than this. The system, I contend, needs a positive explosion of educational innovation the like of which we have never seen before.

Here we come to the double contention at the heart of this pamphlet. Wikipedia world is symbolic of the deep environmental change that is already showing signs of becoming cataclysmic for the traditional 'body plan' of the school. System redesign 1.0, the point at which we have arrived, is itself the result of courageous creativity around the 20 reconfigurations by pioneering headteachers and school leaders. The institutional reconfigurations of system redesign are the basic ingredients required to optimise levels of diversity and disparity.

At the same time, at the very heart of personalising learning and ‘the deeps’ has been the determination to put learning at the centre of the educational agenda. And it was quickly understood that if students were to make progress in their learning, teachers would also have to become better at learning, both within their everyday practice and through their continuing professional development.

In short, the challenge is twofold. To profit from Revans’s law, we must innovate to increase the school system’s capacity to learn by making it a learning community. To profit from the analogy with evolutionary theory, we need to increase diversity and disparity among schools. System redesign 1.0 has laid the foundations for doing both.

Exploiting the leadership potential of generation Y to the full will be essential to meet this two-fold challenge. Generation Y, staff and students, have the ability and energy to be flexible in their learning and to drive greater disparity in schooling. This is educational leadership 2.0, which will speed up the evolution of system redesign 2.0 to proliferate the range of innovative models of schooling.

Eventually there may well be a mass extinction, not only of the industrial and factory models of school that headteachers are rightly consigning to the past, but also of some new species of schools that are still evolving. The old models were designed for stability; the new models in Wikipedia world are open systems, and as Brafman and Beckstrom note, open systems can more easily mutate. We need a huge surge in both diversity and disparity because it is not possible, today, to foresee or plan which few among the many models of schooling will be the most fitted not only to survive, but also to flourish, amid 21st century deep changes and the organisational crisis they might usher in.

8 The new leadership of system redesign 2.0

The journey undertaken by schools and their leaders since 2004 from personalising learning and the nine gateways, through the four deeps, to system redesign 1.0, was deeply influenced by different, but undoubtedly parallel, developments in the business world. Web 2.0 is changing business and will do so more radically in the next decade: that is the message of many of the books cited in this pamphlet. Schooling will also continue to change. The argument is that once again public services, and especially education, can learn from developments in business: Wikipedia world is not a uniquely business phenomenon.

The bridgehead from mass customisation to web 2.0 in business is the changing relationship between producers of goods and services and their customers and clients. The bridgehead from personalising learning to system redesign is likewise co-construction between teachers and their stakeholders, and especially their students. Schools that have been investing in co-construction know that they have taken an irreversible step: there is no way back.

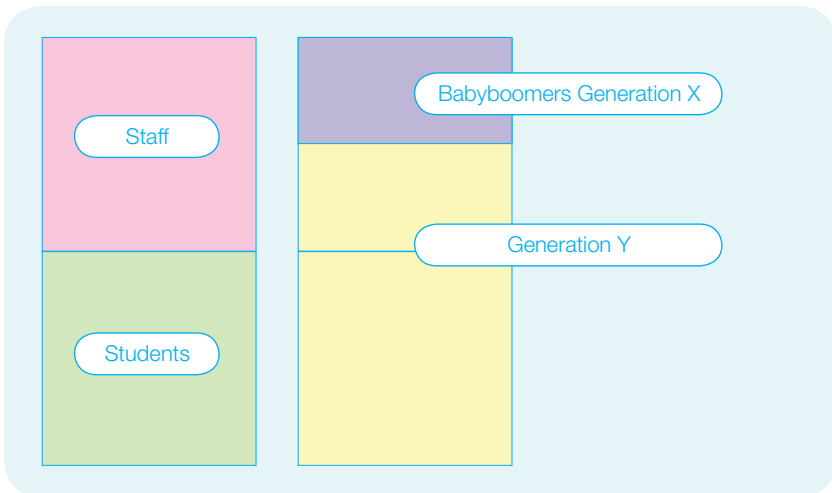
At the same time, the way forward is not a clear, well-marked road. That is why there can be no national policy for it, since policies are roadmaps. Rather, the initiative lies with school leaders and headteachers in particular, for only they can drive the innovation that is the path to the future.

Their task, I believe, is to empower generation Y (GY) – both staff and students – to stimulate the increased diversity and disparity through which the creativity of system redesign 2.0 can be unleashed. In practice, such empowerment means:

- making creativity part of the purpose of schooling and one of its most important outcomes (See also *Deep learning* – 2);
- giving GY staff and students rich opportunities to engage in innovation, that is the necessary time and resources;
- protecting GY so they can take risks;
- providing GY with the knowledge and skill needed to be effective innovators (See also *Leading system redesign* – 4).

This will not come easily to staff from generation X and the baby boomers. The gap between them and GY will continue to widen. The choice for them is stark. They can become defensive as they feel their authority threatened. Or they achieve a new status through distributing leadership and putting their wider experience at the disposal of others. New policies for personal development will be needed. Traditionally, as in the left column of figure 2, policies for staff development, especially CPD, have been quite distinct from policies for the development of students. This boundary has been breached by the schools committed to co-construction and the use of students as researchers. But we must go further. As in the right column of figure 2, the age and status gap between GY staff and students will be blurred, as people on both sides of the line engage in joint development activities to equip them to work together, indeed innovate together, in order to extract the best for education from Wikipedia world. A stronger line is likely to be drawn between GY teachers and older staff, who will have to be ready to learn from GY through reverse mentoring and coaching.

Figure 2 Two models of development



Such changes will be a real test of whether generation X and babyboomers, who currently occupy most of the senior leadership positions, are willing to put into practice the theory that all teachers should be learners. Becoming a true learning community will be a more painful process for senior staff than for anyone else.

Yet we should not make the mistake of assuming that all generation X are lost souls in Wikipedia world, for a minority are relatively at ease there. It is sometimes said that generation Y is a state of mind rather than a division by age, and there is some truth in this. Yes, some will partially inhabit Wikipedia world, but they will be immigrants to that world, forever speaking with a heavy accent. Dual citizenship in the digital world is beyond most of generation X, many of whom will never be at ease in web 2.0 social networking, with its different language and social etiquette, where they do not know how to behave or interact.

But nor should we make the even bigger mistake of treating all GY as digital natives. Some at the older end of GY are, as far as Wikipedia world is concerned, more comfortable with GX 40-year-olds than with some of their peers. GY splits not merely into staff and students but also into those who are ready and able to create system redesign 2.0 and those to whom it remains alien and frightening. Some in this latter group will need as much support as many generation X staff. Leadership in system redesign 2.0 is going to be a matter of 'stage not age', which some staff and some students will find deeply unsettling.

Knowledge transfer between schools will be driven by GY members and through new communication channels that are likely to strike a better balance between the virtual and the face-to-face. Such a balance has never yet been comfortable for generation X staff. For them, it will be a professional challenge to move from a position where they attended conferences and took back new practices to initiate with their students, to a position where students learn about new practices for teaching and learning from students in another school and then expect their own teachers to adopt them. Imagine a world where students tell their teachers not only about the new practice they want, but also about how that innovation should be implemented. In the old world, staff made decisions and then (sometimes) decided to consult students before implementation. In Wikipedia world this goes upside down, as GY come up with new ideas that have to be explained to their elders, who are then consulted on issues of general acceptability, as well as speed and manner of implementation.

System redesign 2.0 has well-established and well-tended roots in many schools. Take the case of projects. As discussed in other pamphlets (*Personalising learning – 4*, *Deep experience – 1*, *Deep learning – 2*), project-based learning has assumed a new importance in schools. True projects are far more than a sequence of lessons linked by an overarching theme. Project-based learning requires teachers to have skills that go beyond those involved in the planning and implementation of a conventional lesson. They need the skills of project management, which are absent from most programmes of teacher training and development.

This does not exhaust the value of project management, for surely students also need help with their management of a true project. For them, engaging in a project is going to be as different from doing a lesson as it is for a teacher.

In *Leading system redesign – 4* it is argued that without skills in project management teachers will not be as effective at innovation as they could be. If GY teachers and students are to become the innovators who drive system redesign 2.0, then both need the skills of managing innovation projects and should be learning them together in joint training.

In system redesign 1.0, schools made a sound investment in *innovation for learning*, and these have secured foundations on which to build. To be as successful in system redesign 2.0, in which ‘working laterally’ has matured and sprouted new branches, schools have to move to a new stage of *learning through innovation*. This transition will be decisive in making schooling fit for purpose in Wikipedia world.

As we demonstrate in the *Leading system redesign* series, it is a new approach to leadership that provides the kick-start to system redesign 2.0. But once underway, system redesign 2.0 will generate yet more new models of leadership that will drive it towards success. Some schools have already taken the first critical steps, as will be revealed in the following pamphlets. Here you will see for yourself that system redesign 2.0 has been born. The new models of leadership on which its maturity depends are enjoying a healthy infancy. It takes courage and ingenuity from today’s school leaders to ensure that they thrive, but it’s happening. To adapt McLuhan’s famous phrase, ‘There are no passengers on spaceship system redesign 2.0. We are all crew.’

Questions

- What emotions does this pamphlet arouse in you? Are you puzzled, angry, frightened, excited, empowered – or what? Why do you think you reacted in this way?
- What ideas and questions did the argument provoke in you?
- How might your professional colleagues respond? Would you expect differences between generation Y and generation X/ babyboomers? If older colleagues feel confused or frightened by these possibilities, how will you support them?
- How might students respond to system redesign 2.0?
- Do the stakeholders in your school believe you offer them ‘invitations to a conversation’ or are they recipients of ‘finished statements’?
- Before you read the other pamphlets in this series, which report on developments in schools, what action (if any) in your school do you think might be warranted by system redesign 2.0?
- What changes do you think are needed in government education policy and how does the argument in the pamphlet bear on these?
- If you disagree with the argument, what in your view does web 2.0 portend for society and for education?

Annex A

Sources and suggestions

See also outside back cover

Yochai Benkler, *The wealth of networks: how social production transforms markets and freedom*, Yale University Press, 2006.

Ori Brafman & Rod A Beckstrom, *The starfish and the spider: the unstoppable power of leaderless organizations*, Portfolio (Penguin), 2006.

David Crow, *Talking about my generation*, The Business, July 2007.

Eric von Hippel, *Democratizing innovation*, MIT Press, 2005.

Charles Leadbeater, *We-think*, Profile, 2008.

Lawrence Lessig, *The future of ideas: the fate of the commons in a connected world*, Vintage Books, 2002.

Matt Mason, *The pirate's dilemma: how hackers, punk capitalists, graffiti millionaires and other youth movements are remixing our culture and changing our world*, Allen Lane, 2008.

Eric Raymond, *The cathedral and the bazaar*, O'Reilly, 1999.

Clay Shirky, *Here comes everybody: the power of organizing without organizations*, Allen Lane, 2008.

James Surowiecki, *The wisdom of crowds: why the many are smarter than the few*, Little Brown, 2004.

Don Tapscott & Anthony D Williams, *Wikinomics: how mass collaboration changes everything*, Atlantic Books, 2007.

David Weinberger, *Small pieces loosely joined: how the web shows us who we really are*, Perseus Press, 2002.

Kay Withers & Ruth Sheldon, *Behind the screen: the hidden life of youth online*, Institute of Public Policy Research, 2008.

On evolution and punctuated equilibrium

Stephen Jay Gould, *Wonderful Life: the Burgess Shale and the nature of history*, Hutchinson Radius, 1990.

Richard Dawkins, *The blind watchmaker*, Longman, 1986.

Kim Sterelny, *Dawkins vs. Gould: survival of the fittest*, Icon Books, 2001.

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