Occasional Paper

'Only Connect!':
A new paradigm for learning innovation in the 21st century

by Valerie Hannon

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Introduction

In this paper I argue that our current 'school reform' and 'improvement' efforts are wholly inadequate to the scale of the challenge that we face, to prepare young people to live well and sustainably on this planet in the new century. Views about what it means to 'live well and sustainably' are contested, of course. What are the skills, knowledge, competencies and, perhaps above all, the values that would enable this? In addition, if we can reach at least a provisional view on these, what does that imply for our arrangements for the organisation of learning?

The heart of this argument is that our current education systems are characterised by a series of 'disconnects'. Principal amongst these are the following.

The disconnect between how schools are organised and how the ways in which we work and learn have evolved outside school

Still reflecting the industrial age, schools for the most part are organised like quasi-custodial factories. Practices and ideas about leadership, learning, collaboration, and the release of collective creativity – which increasingly characterise successful 21st Century workplaces and enterprises – are, for the most part, absent from school environments. The disconnect is sharpest in relation to the skills, knowledge and dispositions which young people will actually need in the coming century – and these are not the ones that schools are set up to equip them with,[1] other than at the most basic level.

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The disconnect between the reality of young people's lives today and their school experiences

This can take many forms. For the privileged – those young learners who are web-enabled, skilled in social networking, and uploading their videos on to YouTube – the school is literally a disconnected, primitive environment, where they are flat-lining until they get can get active again. To the socially disadvantaged, schools too often seem to ignore the factors that create insuperable barriers to their learning well. If, for example, your home is one where worklessness has been the norm for a couple of generations; where education is not valued; where aspirations are low and just surviving is a struggle; the school must make extraordinary efforts to connect – and very few do so successfully.

> a new paradigm needs to evolve.
> The debate about the purposes and values of education must be revived urgently.

The disconnect between the highest and most authentic values of civilised society and those that underpin school systems

This is a harder general case to make. Fundamentally, the contention is that schools naturally reflect the predominant values of their contexts, but that these have become out of synch. A series of shocks to our systems has thrown this into sharp relief. The financial crisis of 2008/9 and its aftermath suggest there has never been a better time to rethink our priorities. Without speculating about its longevity, the crisis has unquestionably been the greatest that this generation has experienced. Most informed commentators judge it to be a fundamental shift, as opposed to a cyclical correction. The nature of the shift may be impossible to discern fully, in the short term, but there are indications to take into account. Deep values of consumption (as an end in itself) and greed have driven the financial collapse. In this context, it is salutary to reflect that the business and financial leaders – now disgraced – who led these dynamics, are *successful* products of our schooling systems, not its failures (Tett, 2009). A different vision of the good life, based on community, equity and values of spiritual awareness and reverence for the planet, presents new challenges for how schools regard their objectives and, in turn, how they motivate and connect with young people today.

Significant though the scale of the financial crisis has been – and the most immediate effects to be felt directly by schools are likely to be through the imminent reduction in their budgets[2] – it is probable that the environmental crisis confronting the planet is of infinitely greater significance. No longer can this be dismissed as apocalyptic hyperbole. The 'Inconvenient Truth'[3] is that the science is now incontrovertible. We can accept neither the consequences of such a dismissive response nor the implications for how young people should be prepared.

Ezio Manzini, of the Politecnico of Milan. expresses it thus:

> The dream of wellbeing dreamt until now by a few is not sustainable for all. We have to change. We have to learn to live better, consuming fewer environmental resources and regenerating the contexts of life. (Manzini, 2009)

Are these considerations unrelated to our discourse about the purposes, processes and organisation of schooling? Should our debates about improving schools proceed without reference to them? Is it possible they can be addressed within the existing frames of applying the evidence of 'what works'? The case made here is that, *in addition* to

those school improvement efforts that rightly emphasise the importance of evidence on the effectiveness of existing practice, and which strive to make this more widely understood and adopted, a new paradigm needs to evolve. The debate about the purposes and values of education must be revived urgently. The new paradigm must entail a holistic transformational shift towards connected institutions and processes, at a whole set of levels. One source of inspiration for these new departures is to be found in the field of social innovation.

Social Innovation: a source of inspiration; a model of driving change

Since reforming education became a specific policy goal, research in the social sciences and (latterly) practice and theory from business have been the principal sources of ideas driving change. However, in the 21st Century a new pool of ideas and energy has become available, which can be described, loosely, as the field of social innovation. By 'social innovation' we mean 'new ideas which work to create public value'. The explosion of these ideas – fuelled by new technologies and ideologies – has touched most of our lives.

Such innovations include developments as diverse as: hospices, carbon trading, microcredit, Wikipedia, participatory budgets, police community support officers, citizen reporters, pledge banks, fair trade, zero carbon housing and personal budgets etc. The list is endless and growing by the day. Some of these have so swiftly become familiar and commonplace, we forget their genesis. Generally they have been pioneered by activists and innovators, driven by social values, who have been alert to the possibilities of new media and global reach. Such innovations are to be found now in every domain of human behaviour, and many can be regarded as 'game changers'.

Consider as exemplars:

- Macmillan Cancer Support,[4] which morphed from a conventional voluntary nursing organisation to becoming a 'force for change';
- Grameen,[5] which makes small loans to the impoverished without demanding collateral;
- Café Direct,[6] the first organisation to establish fair trade practices for poor coffee growers; or
- nabuur.com,[7] which is an on-line volunteering platform, linking on-line volunteers with local communities in Africa, Asia and Latin America – to learn about each other, share ideas and find solutions to local issues.

An associated research field is opening up rapidly. There has long been a knowledge base around technological and process innovation, but that of social innovation is relatively young.[8] Research that considers how social innovation has implications for the way in which we organise, modernise or revolutionise our public services is even more rare.[9]

> the field of social innovation is stimulating an explosion of analysis and thought leadership, emerging from think tanks, foundations and innovation intermediaries

In the UK, the field of social innovation is stimulating an explosion of analysis and thought leadership, emerging from think tanks, foundations and innovation intermediaries[10]. Looking at rich case studies of impactful social innovation, these studies seek to explore the conditions under which radical new ideas can flourish and be scaled to produce significant impact.

My contention in this paper is that the ideas to be found within this research and evidence are filled with rich potential for those who consider the rate of 'reform' in education to be insufficient to meet the challenges that we face. Two sets of ideas are particularly relevant. The first set is based on the work of Clayton Christensen,[11] and concerns the concept of 'disruptive innovation'.

Christensen argues that disruptive innovation (DI):

- is what is needed to **transform** learning/schooling (as distinct from improving it incrementally);

- is a **positive force** – whereby an innovation transforms a market, where services are complicated and expensive, into one that is characterised by simplicity, convenience and accessibility;

- **disrupts** the upward improvement trajectory; and

- often **creates a service that is poorer**, initially, than the conventional service, and so is not attractive to market leaders and their customers

> for the first time in history, we have the tools that allow people to come together, share information and work together without formal organisational structures.

Christensen illustrates his thesis with the classic example of the development of the personal computer. Before its introduction, the most accessible and inexpensive form of computer was the minicomputer, which filled an entire room and required a degree in engineering to operate. The leading manufacturer – DEC – because of its dominance of the field, had little interest in pursuing the angle that Apple was exploring. Apple thought about the needs of non-users – children – and initially sold its model 'IIe' computer as a toy. This was of no interest to DEC's (corporate) customers for the first ten years, because it was not good enough to address their problems. However within a few years, the smaller personal computers were capable of doing work that previously had required mainframes or minicomputers. DEC and other minicomputer companies mostly disappeared in the late 1980s. **They did not focus sufficient resources on the disruption.**

The second set of ideas with enormous implications for how we modernise learning is drawn from the work of people like Von Hippel, Charlie Leadbeater, and Clay Shirky [12]. Throughout their reflections on case studies and in their emergent theorising, the following ideas become apparent.

- Profound changes have arisen in business and social enterprises because ICT enables **mass collaboration** on an immense scale.

- Users are developing products and services with companies, freely and 'open-source'; this is **democratised innovation**.

- We are witnessing **a different model of social change**: transformation by small steps, not driven by strategic planners.

A host of examples – drawn from contemporary developments in fields as diverse as social protest, citizen-journalism, gaming, processes and products in medicine, sports equipment and its use, and crime prevention, etc – show how, for the first time in history, we have the tools that allow people to come together, share information and work together without formal organisational structures. This amplifies their efforts beyond what individuals or even conventional 'organisations' could achieve.

Taken together, these two sets of ideas point to some over-arching principles of social innovation which – it is argued – have profound significance for transforming learning. Fundamentally, there are four principles of social innovation. It is

- open;
- collaborative;
- free; and
- characterised as 'with' (not 'to' or 'for').

What do these principles look like when they are applied to education? Where are the 'game changers' to be found – or created – in this field?

Creating 'Learning Eco-Systems'

> The future is already here – it's just unevenly distributed.
> (William Gibson[13])

Clay Christensen's examples of disruptive innovators give a clue as to where to look for the generators of new models for learning in the 21st Century. If he is right, currently they are likely to be relatively disregarded by the 'market leaders' (schools or districts), attending perhaps to the needs of current non-users of the system (the 'disinterested, disengaged or disappeared'), and with outcomes which are not yet entirely comparable with those of the dominant paradigm.

Three examples, drawn from social innovators in the third (non-profit) sector can illustrate this point.

The School of Everything[14]

The School of Everything, a web-based organisation, is founded on the principle that everyone has something to learn, and everyone has something to teach. The website simply connects up those who want to learn with those who want to teach. Some School of Everything 'teachers' have left jobs in educational institutions because they have become disillusioned. Others are 'pro-ams' – people who have found a way to make a living from their hobbies and amateur passions. The organisation was founded in 2006 by young entrepreneurs with a clear critique of the existing education system, who have set out with an explicit intention to reinvent it. Their view is that the system was designed in the industrial revolution to prepare people for factory work, and that this will simply no longer do. The time has come to rethink education from the bottom to the top.

> The goal of School of Everything is to do for education what YouTube has done for television, or what eBay did for retail: to open up a huge and fertile space between the professional and the amateur.

They think that learning is personal, and starts not with what 'should' be learned but with what a person is interested in. So they are building a tool to help anyone in the world learn anything, and teach anything, how and when it suits them – by putting people in touch with each other, not with institutions.

This should not be confused with e-learning. The internet is full of information, but School of Everything believes that some things are best learned with the help of a teacher, or with support from other people. They want to help learners design their own education and make use of whatever is on offer out there to help them learn. The goal of School of Everything is to do for education what YouTube has done for television, or what eBay did for retail: to open up a huge and fertile space between the professional and the amateur. It should be noted in passing that both of those innovations – and indeed Wikipedia – when

initially launched, provoked ridicule for their patent implausibility. 'Plainly' they could not work. How were quality assurance and reliability to be maintained? One is reminded of the remark attributed to Schopenhauer:

> All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.[15]

Envision

The second example is drawn from the tradition of service learning in the USA[16]. Envision[17] is a 'third sector' charity set up in the UK in 2001 – again by young, value-driven social entrepreneurs, who wanted to challenge the idea that young people are apathetic and disengaged. Today the organisation works with around 1500 young people per year, in partnership with their schools and colleges, to design their own community-based projects. These range from tackling street crime and homelessness, to drug abuse and climate change. The work builds confidence, aspirations and skills in the young people, because the projects are self-chosen and self-organised, though skilfully supported. The example is interesting because it models some of the principles of social innovation. Whilst it supports more conventional (qualification-related) programs, such as 'citizenship', it is also 'open' (or permeable), in the sense of leveraging resources, skills and approaches from beyond the school. It is collaborative and free. Most fundamentally it is about learning **with** young people.

Eastfeast

Thirdly, consider Eastfeast,[18] a non-profit agency founded in 2005 by a group of creative practitioners, comprising artists, gardeners and cooks. Working with collaboratives of schools in the east of England, the Eastfeast method is based on children working an allotment, or garden space in the school grounds, through the seasons. A series of

seasonal outdoor events concludes with a communal feast. Both the process and the concluding event create opportunities for the children and the school to celebrate and share their activities and products, both edible and artistic. Acquiring creative and collaborative skills is fundamental, as is encountering the values of reverence for the planet and an understanding of issues around food production.

The work of Eastfeast revives some familiar concepts from the past – for example, the open classroom and the creative curriculum – but there are important differences. The work is done in real partnership with qualified teaching staff; jointly accredited professional development activities are held; and there is a shared ethos of community learning, reflection and enquiry. The concept of partnership between community, creative artists, practitioners, and professional educators is at the heart of the work. In addition, it incorporates 21st Century information and communications technologies (ICT) and the acquisition of related skills, using digital media to enquire, represent and capture the work.

The value of this approach lies surely in the set of connections it is able to make. Eastfeast's mantra is 'to know our world through a plot of land'.

Reconnecting the school with its community, and the children with values which can too easily become obscured, this work strives to teach children to do what we humans are supposed to do: look after the Earth, and each other. Of course this is just one, UK-based example. Across the world, this notion of **integration**, remedying the disconnects that have scarred the education enterprise, is manifesting in different settings. High Tech High, a school in San Diego[19] models these integrative principles by:

- creating permeable boundaries with communities and not-for-profit organisations;

- employing cross-disciplinary modes of enquiry (underpinned by rigorous concept building); and

- addressing real-world, urgent and compelling themes that engage with the predicament of communities and the planet.

Even on conventional terms, High Tech High's outcomes (for example, graduation and college entrance) are outstanding. Considered from the perspective of the degree to which the real challenges of the 21st Century are being faced, they are even more so.[20] To be genuinely open and collaborative, perhaps schools need to set about purposively creating learning eco-systems, seeking out partners from diverse sectors with challenging methods and fresh perspectives.

The example of Eastfeast, above, was drawn from a set of innovative school field trial sites, which have been part of The Innovation Unit's program to support schools in England as they strive to develop 'Next Practice'[21]. These schools set out to address some of the intractable problems that faced them, and which did not seem to be susceptible to the solutions developed within the prevalent school improvement models.[22] In doing so, they have been evolving approaches more closely focused on the underlying disconnections that they experience in their everyday work. They are responding to a context in which

- information and knowledge will be more readily available from many sources;

- learners will expect to have more choice than they currently experience and more opportunities to participate in learning; and

- social skills will be increasingly important, especially the ability to collaborate and to empathise.

In a knowledge and services economy, driven by innovation, many young people will experience an increasing sense of insecurity, with the dangers of social exclusion compounded. The schools in The Innovation Unit's 'Next Practice' program focused on different aspects of how the organisation of learning could change.

In 2008, Charles Leadbeater, the leading authority on innovation and creativity, visited a sample of these schools to explore and understand their work. His report *What's Next? 21 Ideas for 21st Century Learning*[23] chronicles some of their efforts. Whilst amongst them there is considerable diversity, Leadbeater found some emergent principles underpinning their practice. He noticed diverse means of **modelling efforts to build new relationship, or connections**, which:

- build **participation**;

- provide learners with **recognition**;

- make children feel **cared for**; and

- **motivate**.

> In a knowledge and services economy, driven by innovation, many young people will experience an increasing sense of insecurity, with the dangers of social exclusion compounded.

Extrapolating from his observations, Leadbeater hypothesises that these principles of participation and connection suggest the set of features that is likely to characterise successful 21st Century learning systems (see Figure 1).

Of course, all of these 'future' aspects are already in (next) practice somewhere. The future is already here. It is just unevenly distributed.

Figure 1. Suggested characteristics of successful 21st Century learning systems

Learning Feature	Past	Future
Where Learning takes place	Mainly in schools	In schools (including Studio schools, learning villages and open campuses), cultural centres, businesses, homes, virtual centres and other places across the city
Who learns from	Teachers	Teachers, parents, other skilled adults, peers and social networks
Learning Mode	Instruction	Interaction, collaboration More learning by doing and discovery
When	In school terms and hours The Lesson	All the time, in different periods that more suit people's individual learning
Assessment	End of the line Focus on cognitive skills	During learning for better learning More peer-to-peer evaluation and self-evaluation against learning plans
How	In classrooms, from books, whiteboards	More real world learning Schools as productive units
Funding	To schools and school boards	More to pupils, learning collaboratives and networks
Standards/Measures	Top down	More bottom up targets and self-evaluation

The Key Frontier: Pedagogy in the C21

Despite the immense power of the new technologies to transform learning, the arguments assembled in this paper suggest that the human dimension in learning will be as important in the future as it has been in the past. **Connection** – with one's community, with individuals who care about you and your progress – will be as vital in the effort to learn how to live well as it always has been. The conditions however have changed. This has implication for the role of the teacher. The new context is one where knowledge and information is ubiquitous; where authority cannot be taken for granted; where there are potentially numerous sources and settings for learning; and where choice and respect are expected.

Far from the role of teacher becoming redundant as learning becomes democratised, it is likely that the skill set of the professional educator will shift towards expertise in pedagogy: understanding with precision how people learn, and how learning opportunities need to be designed to facilitate this process. This is some distance from the model of the teacher as the subject expert, whose prime function is to transfer their knowledge to others, and identify the materials to support this.

Pedagogy sits at the interface of curriculum and assessment, the other two key components of the learning process. Teaching in the 21st Century needs to be aware of its limits. Teachers are preparing young people to do jobs that as yet are uninvented, without names, with unimaginable technology, which will exist in a context where humans will be struggling to sustain life on earth.

> Do not confine your children to your own learning, for they were born in another time. (Hebrew proverb)

So, a new focus on the neglected art and science of pedagogy for the 21st Century is overdue. This at least is the case in the context of the relatively rich 'developed' nations. In developing and third world contexts, the desire to learn is so strong (because the incentives are so powerful) that young learners often pursue opportunities relentlessly, irrespective of the quality of teaching, or even in the complete absence of it.[24] However, in western contexts, the natural curiosity and drive to learn of the young human animal are often lost, for a wide variety of reasons which could be speculated upon. The missing element is **engagement**. Too many young people in our schools are just going through the motions – even amongst those who are apparently 'successful' by conventional standards. This returns us to the theme of 'disconnects', proposed earlier in this paper – and specifically to the disconnect between the realities of young people's lives and their experience of school: its curricula, modes of learning, and lack of outlets for creative energy.

Among other attempts throughout the world to tackle this issue[25] is the Learning Futures program, which was launched by The Paul Hamlyn Foundation (PHF), supported by The Innovation Unit, in 2008.[26] This program aims to ensure that more young people engage actively and positively with their learning through school and retain a commitment to learning beyond their school years. It builds upon the antecedent work of Musical Futures[27] (a PHF program focused on deepening engagement and achievement in music) and The Innovation Unit's 'Next Practice' program (especially the strands developing personalisation and communities for learning)[28].

The subject of enquiry and innovation for the program is specifically in the area of pedagogy – across the whole curriculum. The aim is to achieve learning that is authentic and motivational. This involves identification of the optimal ways to engage young people and the integration of learning that goes on inside and outside of schools. Such learning may be led, generated or supported from a range of sources. The program seeks to identify the fragmented practices that have already been developed successfully, and to enable lead innovator schools both to refine those practices further and to combine them. The provisional conceptual model that captures this approach is a work in progress. Currently, it describes these domains of practice as shown in Figure 2.

Figure 2. Learning Futures domains of practice
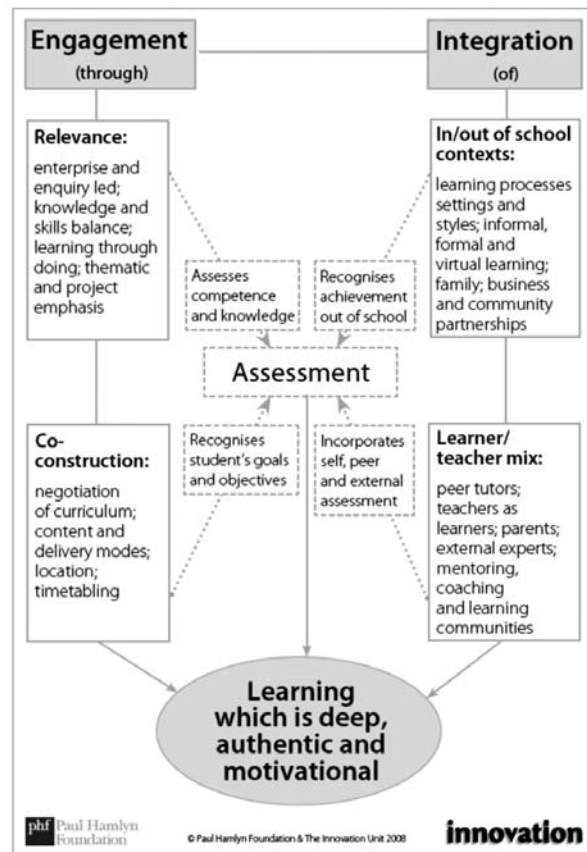
'Engagement' is a term sometimes used interchangeably with 'motivation'. As a construct, it has not been researched as deeply as the cognitive and meta-cognitive processes of learning. Many learning scientists now believe that not all students learn in the same way and that they differ in the value they attach to new knowledge and newly acquired strategies. Therefore, models commonly used to design teaching and learning do not capture all of the complexity that students bring to their learning. There is as yet no all-encompassing motivation theory that explains why students are or are not motivated by 'school learning'.

Learning theorists have proposed a set of 'mini theories', providing insight into how students' perceptions, cognitions, emotions and commitments energise the learning process (Boekaerts, forthcoming). The emphasis on relevance and co-construction builds upon in-class studies, which have cast light on how students' engagement is associated with specific classroom features. This program will go further however, seeking to model – in the construct of 'integration' – some of the processes of social innovation that were discussed earlier: permeability; collaboration; and 'with', not 'to' or 'for'. In the domain of 'learner/teacher mix', for example, we want to assess the power of:

■ systematically and continuously building into the learning design a range of opportunities for learners and teachers to take on different roles;

■ systematically incorporating contributions from a diverse set of sources; and

■ ensuring that all young learners are mentored and coached.

The domain of 'in/out of school contexts' has seen considerable progress in many schools, with the development of virtual learning environments (VLEs), but this is by no means widespread, and many young people move from a 'wired' real life environment to a relatively disconnected one. Consider Figure 3, which is drawn from the Cisco Systems White Paper (2008) mentioned earlier in this paper (and see Endnote 1).

Figure 3. Media Consumption by Percent
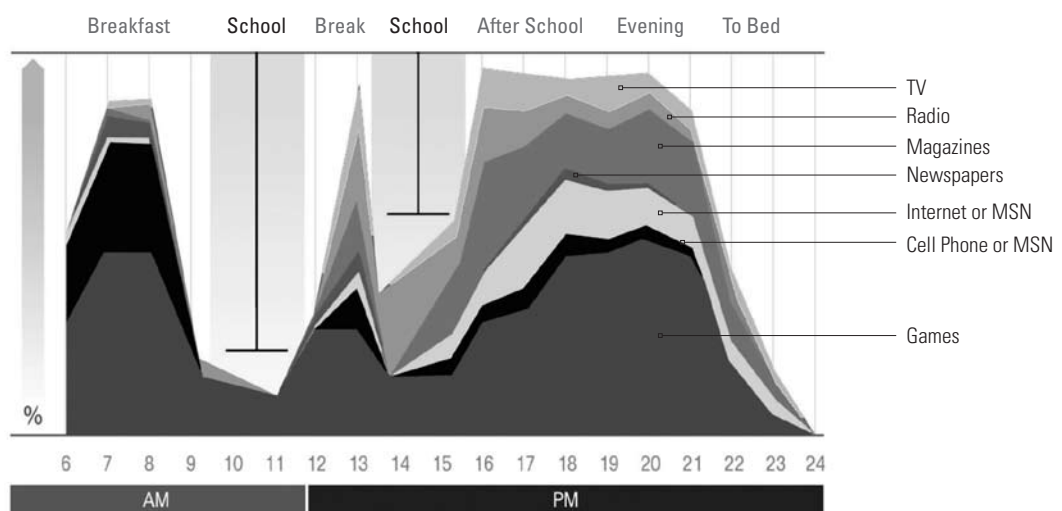
It may now have reached the point that the majority of young learners read more websites than they do books; write more emails/posts than they do essays; and spend more time on-line than they do in the classroom.

It will be apparent that the thrust of the pedagogical style set out above is social constructivist. However, this should not be taken to be synonymous with any lessening of rigour. That is why the pedagogical task is now so challenging and so exciting, entailing as it does the need to create learning designs that acknowledge the hierarchical structures of knowledge, as well as the value of balancing transmissive styles with the enquiry-based and collaborative. It should perhaps be made clear that the schools participating in the Learning Futures program are confident and successful. They understand that their students must also succeed in the conventional prevalent accreditation systems.

It is interesting to reflect that success within conventional measures does not always preclude the search for a new paradigm. The education system that has been most successful in the last decade, in the international comparison league tables (the Program for International Student Assessment – PISA), is Finland. Far from remaining content with its existing models which have produced this success, Finland recognises that the new age compels the search for innovative approaches. Timo Lankinen, Director General of the Finnish Board of Education, describes the Finnish innovation agenda as characterised by:

- ubiquitous technology, ubiquitous opportunity;
- collaborative, social-constructivist learning;
- problem-based instruction;
- progressive inquiry, experimental study;
- peer feedback and peer cooperation;
- contextual, authentic learning sites;
- networked local, technological and social forums of learning;

- hands-on, on-the-job, real-life learning arrangements;
- on-line study in virtual environments, through social media, with mobile tools;
- blended teaching methods, hybrid learning resources; and
- public-private partnerships.

(Lankinen, 2008)

A successful system, in 20th Century terms, knows it must become radically innovative for the changed conditions of the 21st Century. This agenda is not a merely technical one. The imperative to transform our education systems needs to engage the passions of educators, connecting with all their intelligences, just as we are seeking to engage young people.

> It is interesting to reflect that success within conventional measures does not always preclude the search for a new paradigm.

In 1910, E M Forster wrote, as an epigraph to his novel Howard's End, these words: 'Only connect!' When it was written, this not concern technology but became the leitmotif of his great body of work on the human condition. In reflecting on the themes addressed in this paper, consider the full quotation:

> Only connect! That was the whole of her sermon. Only connect the prose and the passion, and both will be exalted, and human love will be seen at its height. Live in fragments no longer.

(E M Forster, *Howards End*, first published, 1910)

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Endnotes

1. For a full discussion of this issue, the reader should refer to Cisco Systems (2008) *Equipping Every Learner for the 21st Century: A White Paper*, Cisco, San Jose, California, p 5. This can be read or downloaded at http://newsroom.cisco.com/dlls/2008/ekits/Equipping_Every_Learner_for_21st_Century_White_Paper.pdf?POSITION=LINK&COUNTRY_SITE=us&CAMPAIGN=Century21Learning2008&CREATIVE=Equipping+Every+Global+Learner+for+the+21st+Century&REFERRING_SITE=NewsatCiscoPressKit

2. First signs of this have appeared in California where the Governor has announced the end of school textbooks in favour of online resources as a response to the fiscal crisis and the collapse of property values in the State on which school budgets depend. For details see http://gov.ca.gov/press-release/12225

3. To remind yourself of what the film had to say, either view it again or get an overview by reading through the material at http://en.wikipedia.org/wiki/An_Inconvenient_Truth

4. For more information, see http://en.wikipedia.org/wiki/Macmillan_Cancer_Support

5. For more information, see http://en.wikipedia.org/wiki/Grameen_Bank

6. For more information, see http://en.wikipedia.org/wiki/Caf%C3%A9direct

7. For more information, see http://www.nabuur.com/

8. Much has been written in this area but key publications include: Von Hippel, E (2005) *Democratizing Innovation*, which is downloadable at http://web.mit.edu/evhippel/www/books.htm; Shirky, C (2008) *Here Comes Everybody: The Power of Organizing Without Organisations*, Allen Lane, London; and Christensen, C (2003) *The Innovator's Dilemma*, HarperCollins, London.

9. See, in particular, Christensen, C (2003) *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*, McGraw-Hill, New York; Leadbeater, C (2008) *We-Think: The Power of Mass Creativity*, downloadable at http://www.wethinkthebook.net/home.aspx

10. See, for example, NESTA (2008) *In and Out of Synch: The Challenge of Growing Social Innovations*, which is downloadable at http://www.nesta.org.uk/in-and-out-of-sync /; NESTA (2008) *Transformers: How Local Areas Innovate to Address Changing Social Needs*, at http://www.nesta.org.uk/transformers/; (The Innovation Unit 2008) *Honest Brokers: Brokering Innovation in Public Services*, at http://www.innovation-unit.co.uk/about-us/publications/honest-brokers.html; DEMOS (2007) *Unlocking Innovation*, at http://www.demos.co.uk/publications/unlockinginnovation

11. For details, see his website at http://www.claytonchristensen.com/

12. For a sample work by Von Hippel see Endnote 9, above. For background information on Leadbeater and Shirky, see the relevant Wikipedia entries at http://en.wikipedia.org/wiki/Charlie_Leadbeater; and http://en.wikipedia.org/wiki/Clay_Shirky.

13. Wikipedia attributes this often cited 'quotation', or a variant of it, to an NPR interview in 1999 – see http://en.wikiquote.org/wiki/William_Gibson

14. For background information see http://schoolofeverything.com

15. Although generally attributed to Schopenhauer, there is some dispute over the actual source. See http://en.wikiquote.org/wiki/Arthur_Schopenhauer

16. For background information see http://www.servicelearning.org

17. For background information see http://www.envision.org.uk/index.html

18. For background information see http://www.eastfeast.co.uk

19. For background information see http://www.hightechhigh.org/schools/HTH

20. See for example, The Students of High Tech High (2005) *Perspectives of San Diego Bay: A Field Guide*, published by Next Generation Press. This has been highly praised by many eminent academics, some of whom are amazed that high school students can produce work of publishable quality to such rigorous standards. It integrates rigorous science with humanitarian principles, dealing with the threat to the eco-system, no less.

21. For more details on the work of the Innovation Unit (IU), see http://www.innovation-unit.co.uk For further information on the concept of Next Practice, and the IU's program to support it, see Hannon, V (2006) *Next Practice' in Education: A Disciplined Approach to Innovation*, which is downloadable from the IU website at http://www.innovation-unit.co.uk/images/stories/files/pdf/nextpractice_in_education.pdf

22. The evaluation of the Next Practice program can be found at http://www.innovation-unit.co.uk/content/view/452/981

23. Leadbeater's report is downloadable from http://www.innovation-unit.co.uk/about-us/publications/whats-next.html

24. See for example the work of Professor Sugata Mitra (at http://www.hole-in-the-wall.com/Beginnings.html). Mitra tested his hypothesis – that children would learn the skills of computer use without any adult help – by simply installing computers in walls in slums and villages throughout India.

25. See for example the latest program launched by the Organisation for Economic and Community Development's centre for Educational Research and Innovation (OECD/CERI), *Innovative Learning Environments*, which is described in OECD/CERI (2008) *Innovating to Learn, Learning to Innovate*, OECD, Paris.

26. For background and details see http://www.phf.org.uk/landing.asp?id=368

27. For background and details see http://www.musicalfutures.org.uk

28. *See Learning Futures: Next Practice in Learning and Teaching* downloadable at http://www.innovation-unit.co.uk/images/stories/files/pdf/learningfutures_booklet.pdf

29. For background and details see *Learning Futures: Next Practice in Learning and Teaching*, which is downloadable at http://www.innovation-unit.co.uk/images/stories/files/pdf/learningfutures_booklet.pdf

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