



Personalisation seminar series

Seminar 1:

Learner voice: How can technology be used to support learners to shape and direct their own curriculum?

Report

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December 2004

Introduction

This seminar series aims to contribute to the development of a new approach to personalised learning. Such an approach would enable learners to own their personal learning strategies within a supportive context dedicated to opening up possibilities and opportunities, and overcoming traditional barriers to participation in new knowledge domains. The final report will target policy makers, industry, researchers and schools. We are aiming to think within a 15-year timescale¹.

In writing up the notes from the first seminar, we have chosen a pre-analytical approach that groups the points raised during the day thematically. The points are listed discontinuously, indicated by the use of bullet points.

1. Towards a conceptual framework

1.1 Entitlement and access to resources

1.1.1 What do we mean by entitlement?

- Within educational debates, entitlement has come to mean something that is quasi-mandatory, such as compulsory schooling and a compulsory curriculum which provides every child in the UK with the broad education to which they are entitled.
- In the final document we will need to clarify whether we are aiming to move towards a new set of mandatory requirements of an education system and legal rights for students, or whether we are undertaking more blue skies considerations of what all students would have access to within an ideal educational experience.
- When we explore possibilities for a new set of entitlements, we need to ask whether entitlement is essentially about compulsion or choice. Are we talking about more or less compulsion in the system? Where we enable choice we put more obligations on the institutions and fewer restrictions on individuals. For example, providing more choice of subjects for post-16 students can mean creating more obligations for institutions to collaborate. ICT can help this to happen.
- The Tomlinson report is a cause for optimism because it provides a fundamental shift in the concept of entitlement. There is a clear need for cross party commitment to long-term agendas.

Entitlement to what?

1.1.2 Entitlement to a range of options and information about where those options may lead

- One of the purposes of an education system is to provide students with the following: a range of options; information about where these options may lead; support in making informed choices between these options; and means of following up the decisions they make. Currently, it was argued, the scope for choice in the education system is very limited.

¹ DfES is intending to make a five-year offer in spring 2005, to make provision for the next legislative programme, and wants this offer to be informed by a 15-year vision. It's too late to influence the five-year plan, and so politically a 15-year timescale would be ideal.

- In order to make informed choices one needs insights into the possible implications of those choices. One participant argued that we need a projective/predictive approach and an approach that has memory - encompassing statistical models of likely outcomes from choices, and narratives/biographies of those who have made those choices in the past.
- Discussions revealed a lack of clarity around what exactly is the range of things that students are choosing from. Furthermore, a new range of opportunities, tools and materials brings a new set of entitlement to content and experience, alongside questions of how learning is validated and how students may manage their own learning.

1.1.3 Entitlement to operate in a personalised system

Entitlement to identify and mobilise resources.

- Students are entitled to be able to operate in a personalised learning environment. This indicates a set of sub entitlements: what are the strategies, skills and competencies that students and parents need in order to operate within a personalised landscape? For example:
 - the ability to identify existing resources
 - negotiation
 - self esteem

Developing clear notions of the personalised landscape will enable us to think clearly about what those entitlements might be.

- A key entitlement in a personalised system is the entitlement to mobilise the resources of the educational establishment. Different people are differently positioned in terms of their current competencies to mobilise resources: at present, we don't teach people how to mobilise resources.
- The more skilled learners are the more competent they become to seek their own resources. In this way, it is important to realise that in order to create more autonomous learners, greater opportunities for autonomy must be given from a young age.
- Motivation is key: knowing what questions to ask and having the desire to ask them relies on a great deal of existing knowledge, which is culturally informed. For example, the middle class has a motivation to learn that does not perhaps exist in other socio-economic groups, especially those disaffected with education. Another example is the Chinese community in Liverpool, whose view of education as a way out of poverty generates enormous motivation among students and their families. In this way, personalisation could well reproduce existing inequalities of opportunity.
- Indeed, argued one participant, the discussion is in danger of working too much from an inductivist model of learning in which children are left to explore at their own discretion without teacher direction and they learn when they are ready to learn. Evidence suggests that without support, children from poorer families don't tend to do very well in this model. One possible reason is that they may lack culturally constructed motivation and resources to optimise their own learning experience.
- Generating motivation, then, is a key role for the education system. This must necessarily be personalised, recognising diversity among students. Different people will respond differently to attempts to generate motivation and enthusiasm.
- Educationalists and ICT professionals must work together to make the manipulation of ICT personally and socially relevant to students and therefore useful to them.

- We need to insure that the individual is utilising a wider range of resources in a way that leads to better outcomes - this relates to the assessment debate. Not all resources will be useful: for example, a lot of online support communities can be disastrously depressing. How can we ensure quality, and educational and environmental safety?
- Students in a personalised system should be entitled to have their diverse learning experiences recognised and validated within a flexible and responsive assessment approach.

1.1.4 Entitlement to types of learning processes

- We are working on the understanding that students have entitlements to:
 - Reflect on their own learning
 - Understand how they learn
 - Have multiple possibilities
 - Negotiate and discuss what they want.

How can technology support some of those entitlements?

- Students are entitled to an education that is relevant to life after the education system. They are entitled to the opportunity to acquire useful skills and recognisable, comparable qualifications, and the opportunities that these create. Additionally, students are entitled to the formal acquisition of skills that enable them to operate effectively in the informal world. Much work could be done on this. For example, Chris Yapp questions why he was 40 before he attended a class on listening, when listening is such a key life-skill.

1.1.5 Entitlement to reject education?

- Is there a learner entitlement not to learn core skills? Where does prescription end and personalisation begin? How should the system respond to students who want to reject formal education?

1.2 Equality

- One participant argued that personalisation offers us a valuable way to reach disaffected students and their families, by creating opportunities for greater diversity in teaching, learning and assessment. However, ICT has a widely recognised capacity to augment inequalities in circumstances where the aspiration to actively reduce inequalities is not a central priority.
- There are significant differences between schools' and individuals' physical access to ICT, depending on their level of economic prosperity. This is arguably a short-term problem; government is investing in equality of access to ICT for schools and families. However, the best-resourced will always seek to attain higher performing technologies, augmenting their comparative advantage. For example, the largest sales of ICT have been to private schools, which can only reinforce inequitable outcomes. These patterns are not evident in other countries such as France and Australia where the school binary is not designed to shore up the social status quo.
- Access to skills, confidence and motivation are of equal significance to access to ICT itself. You can't just give a laptop to a poor family and expect an improvement in the capacity of learning potential; many people may need support in acquiring the necessary skills and confidence to use ICT effectively. Effective home access to ICT has a big impact on proficiency, with a direct knock-on effect in the classroom. For example, it was reported that some teachers choose not to use ICT because of the levels of inequality between those good at using computers and those not so good.

- Inequalities will never be totally eradicated: it is how you limit the damage and attempt to reengage the disaffected that is important. If we know who will be disaffected we can manage the risk more effectively.
- A question for policy makers over the next five to 15 years is whether we want to make personalisation a reality for 1% of the population, for 10%, 50% of the way, or for 80%, 20% of the way.

1.3 The purpose of an education system

- There is insufficient debate about the purpose of education. Many participants called for the creation of opportunities to discuss the purpose of education in the classroom, in the staff room and in the media beyond exam results time.
- One of the purposes of an education system is to provide students with: a range of options of routes for knowledge, for action, for identity; information about where these options may lead; support in making informed choices between these options; providing means of following up the decisions.
- In more detail, the purpose of an education system is to:
 - validate and recognise diverse sites of expertise and diverse forms of expertise that learners and communities bring into the educational system
 - widen awareness of different ways of living and knowing - and provide opportunities to explore these different ways
 - offer the tools to learners and families and communities to engage with the resources of an education system and a wider community:
 1. communication
 2. confidence
 3. negotiation
 4. networking
 5. collaboration
 6. planning
 7. prediction
 - offer multiple communities and strategies for engaging with knowledge - towards pluralisation of options
 - offer tools to collate, reflect upon and link different learning experiences.
 - Donald Rumsfeld model of lifelong learning - preparing children to deal with the unknown unknowns.

1.4 Learning processes

The education community has an impoverished language of learning: this prevents explicit and reflective learning about learning. We need to develop a lexicon for talking about learning - urgently - for learners, teachers, and the wider community.

1.4.1 Towards a typology of learners

- Can we identify different types of learner, such as negotiative learners, collaborative learners, reflective learners, and so on? Could we identify learner characteristics from a young age? Could this approach be useful in supporting learners within a personalised system? Could learners benefit from understanding which types of resources, particularly teaching style, suit them best? In order to achieve this, we would need greater scope for supported reflection within the learning experience.
- Are there any students for whom a highly segregated, subject based curriculum is appropriate?

- There is a risk of labelling students in such a way as to cage them in a style and limit freedom, spontaneity, and growth.

1.4.2 Learning to learn

- The current research and evidence base on learning to learn does not give us a model of progression that we can expect children to move through; a uniform, linear model would not be useful.
- Part of learning to learn is about articulating your learning objectives, and then planning your journey towards them. Simply getting children to have personalised, internalised learning objectives would be a major achievement.
- We need to enable students to develop understanding of the processes they are going through when they are learning.

1.4.3 Process-oriented and goal-oriented models of learning

- Strategically, an objective-based approach is necessary, while pragmatically a process-based approach is more helpful - the two are not oppositional. Irrespective of where you're heading you need to engage with the current level of skill. A scaffold creates a plan for the route between where you are and where you want to go. How can technology be used to support this?

1.4.4 The education community's attitude towards the learner

- Do we think of learners as 'in waiting' for real life - as people who will have to demonstrate at the end of a finite educational experience that they know x y and z? Or do we think of learners as active, as involved in real activities, and that the outcomes of this are people able to act independently and demonstrate not only that they 'know that' but 'know how'? We need a model of agency and doing rather than learning and becoming.

1.4.5 Pedagogy

- We need new approaches to pedagogy that look at multiple intelligence and learning intelligence, emphasising creativity and energy.
- Children do not naturally collaborate; the role of a new, innovative pedagogy should find ways to support collaboration.
- Teachers and students alike need to understand different pedagogic models, and so we need to validate reflective dialogue about learning in classrooms.
- Is knowledge in nuggets still of any value? Why learn any facts in school if they're all accessible at the click of a button? Should we focus on learning how to learn, teaching methods and types of thinking that can be applied to any subject, rather than teaching facts? In this way we can develop the Donald Rumsfeld approach to education, equipping students to deal with both the known and the unknown unknowns, alongside their existing 'knowns'...
- A personalised system generates needs for new types of support; mentoring, guidance, route mapping for individuals. What should that support look like? Who should provide it - teachers, peers, parents, community, videostreamed experts? When should they provide it, and how do you organise these possible systems? (For more on this see Section 3).

- We don't want to regress to an individualist model of isolated exploration and passive learning when what we need is highly active teaching and learning through collaboration and conversation aided by ICT.
- We need to acknowledge the multiple scales of learning activities and communities - at individual, family, peer group, community, regional, national, international and global levels.

1.5 Learning processes and assessment

1.5.1 Achievement at stage rather than failure at age

- We need to unhook progress through the education system from age.
- Many seminar participants called for a more robust notion of readiness as a driver for assessment, holding up the ABRSM musical instrument examination model as an example, and the NVRS model for languages which is based on the music grades system. This allows learners to follow their own pace of learning.
- Could we build on the grade model to increase greater breadth? Currently, Grade 6 is the only option for formally assessed progress beyond Grade 5. Can we introduce a more flexible and varied model of assessment?
- We currently have a deficit model of education and assessment, in which you should be able to do this by age 7 and if you can't there is something wrong with you. We need instead to develop an aspirational model.

1.5.2 Summative and formative assessment

- Summative assessment occurs at the end of a piece of learning; eg GCSEs record the output of the learning process and therefore come at the end of the compulsory phase of schooling. Currently, the entire system is based on measuring outcome.
- Formative assessment is less output-based and more process-based, and can be defined as the *use of assessment throughout the learning process, in order to inform the next phase of learning*². An example of formative assessment is teachers marking students' work or asking questions in order to gauge what children have understood, and use their responses to inform the next phase of teaching.
- Formative assessment must begin by asking what knowledge the children are bringing into the classroom and what their learning needs are, then develop a judgement of what they need to do in the light of where they are now. We need, therefore, ways to assess where they are now.
- Technology aides summative assessment but could be used formatively - we have more data and assessment information for tracking and monitoring progress and means of control.

1.5.3 Assessment

- The Assessment for Learning project at London and Cambridge Universities found that students read grades but don't read the comments on marked written work. The researchers have shown empirically that if teachers just give comments rather than

² Matthew Horne, DfES Strategy Unit.

grades the children's learning improves more. Students in the study who only received comments achieved GCSE grades 1-2 grades higher than everybody else.

- Assessment in a personalised system must be able to reflect and compare different learning journeys. How can assessment reflect what a student's learning experience has now equipped them to do, in a way that can be formally recognised by universities and employers?
- Are there different needs and opportunities for different degrees of flexibility of assessment at different stages of education?
- How could we measure a child's strengths and weaknesses on a regular basis? How would we be able to say, you can go further in that field, you can push it a bit? What are the frameworks we could use to identify advanced metacognitive skills rather than basic?³
- To what extent can ICT be used for qualitative forms of assessment? In a simple quantitative exercise like doing maths questions online, ICT is/could be able to identify repeated themes that you're going wrong with and direct you towards resources, human or otherwise, to help you do more learning on the areas you're patchy on. What about more qualitative needs?
- We should consider the potential for creating assessment involving learners, eg AFL - Assessment For Learning, and for using ICT in this. Children can start to participate in activities previously reserved exclusively for teachers. For example, Personalisation through Participation discusses children setting themselves difficult and testing targets.
- Jackie Marsh introduced 360 degree appraisal assessment in which students assessed teachers. The first time around they took advantage, but the second time around they used it in an insightful, productive and highly engaged manner. One obstacle to developing this approach is institutional settings which mitigate against the teacher being able to take that level of risk.
- One purpose of education is preparation for employment. People working in creative industries get employment by demonstrating their skills rather than by qualifications. Perhaps learners need agents rather than careers advisors: agents would encourage and stimulate learners into gaining a wide repertoire of skills.
- Learning as a process of certification: what is the purpose of certification? Most school qualifications don't qualify you to do anything.
- Does personalised learning mean personalised assessment?
- Can we link personalised, portfolio education into existing examination systems? For example, home-educated students taking mainstream exams like A-levels, often earlier than school educated children.

1.5.4 Modes of demonstration and assessment

- Current modes of output and assessment often favour white, English-speaking middle-class students and fail to recognise and validate alternative value systems and forms of expression. PL must reflect the reality of multicultural Britain.
- How can we diversify modes of output and assessment whilst retaining comparability?

³ Jim Ridgeway and colleagues are doing some interesting introductory work in that.

- How could technology facilitate a richer assessment model? For example, paper-free NVQ's are used in the care sector with assessment using digital cameras and laptops.
- Kids love computer games and they're good at them, but they - and their teachers - get no credit for using them in the classroom.
- Other suggestions included richer assessment models and formats like coursework, extended projects, scripts and community models of validation.
- The portfolio can be a more powerful model of representing knowledge and learning than qualifications.

2. Tools and strategies

What would a learner's toolkit look like? For starters, it would encompass knowledge tools, social tools, and technological tools. We must bear in mind that tools aren't just technologies but can be mental models or representations, or even 'just' language.

What are the roles that we would like technology to play?

2.1 Supporting learner voice and formative assessment

- Many calls were made for technologies which support formative assessment and much greater symbiosis between learning and assessment. Technology could provide opportunities to diversify modes of output, that is, the way that learners capture, record, reflect upon and share their learning experiences.
- What assessment formats are made possible by technology?
- We need tools that allow learners and communities to demonstrate their expertise outside its original context, and to capture and communicate what it is that they already know in different settings.
- How can technology be leveraged to give the learner choice about how they want to express the knowledge they have, producing, for example, an essay, song, video, or presentation? To what extent can you give children choice in how they represent their knowledge? Society requires that people are able to express their knowledge and ideas in a variety of ways: if students choose a consistent mode of output over the years to the exclusion of others, they may be disadvantaged.
- How could technology be used to provide maps to others, thus giving them the opportunity to learn from the route that previous students have taken? Could we use technology for forecast modelling, using biographies, histories and narratives so that students can access those experiences?
- The stuff of a child's learning will progress over time. Can we develop tools which adapt to the flexible overlap between cultural change, technological change, and knowledge change? In trying to capture the interactivity and the fluidity of learning, lexicon is crucial. Technology must be able to work with that fluidity.
- Could we have intelligent agents that develop with you throughout your school career, organising the records of your learning and helping to filter away things that aren't relevant?
- What prevents the student from remaining constantly within the bounds of the safe and familiar: how do they encounter novelty?

- Knowledge and uses of technology will differ between students and will be constantly in flux, as will the technologies themselves, over the next 15 years. How can we create the spaces and opportunities for a system to tap into this?
- The use of technology is culturally situated. The system needs to make better use of popular cultural uses of technology - often poor homes have a wealth of cultural capital in the use of digital technology.
- In a game called 'never wins the night', a student can play through the virtual environment and solve 'quests' eg, spell something. The game gives legitimacy and recognition to existing ICT skills developed outside of the classroom, and generates student enthusiasm for a familiar mode of interaction.
- Chris Yapp's wife is an RE teacher. She got a much better return of homework when she gave the pupils a choice about how they present their work, in the form of a rap, for example, instead of a more conventional essay form.
- Another good example of diverse outputs is Gavin O'Carroll's work with students at the City Learning Centre, producing a radio soap opera each week in their PHSE classes.

2.2 Connecting humans

People are the biggest resource, and ICT can help to connect them. In order for this to work in practice, the students, teachers and institutions need to learn how to learn, about ICT in particular. This requires resources for support. Text-based communication is very limited, but in future normalised video streaming can potentially get much closer to the quality of face to face communication, creating new opportunities for connectivity regardless of distance.

2.2.1 Learner communities

- We need tools that allow individuals to participate in diverse knowledge building communities: to find communities where some may not exist locally, to build communities of learning in local communities, to share knowledge between members of communities, and then across different communities.
- ICT can help with creating online learning communities of stage, not age, and connecting groups of students who may be, for one reason or another, minorities within their own school.
- We need to encourage peer learning in terms of the technical use of ICT. We tend to create a dependency model, but we can empower students by making them teachers also.

2.2.2 Teacher and school communities

- We want to connect teachers to resources and to each other. ICT can help to share good practice, like Teachers' TV.
- ICT can play a powerful role in connecting institutions, in order to collaborate to provide students a greater range of subject options, for example.

2.2.3 Connecting learners to teachers/experts/mentors

- We need to develop strategies and tools for communication between teachers and students within the school.

- Communication chasms currently exist between some teachers and pupils. Can well-designed websites provide information 'on the level' and communicate options to students in the way that teachers are sometimes unable to?
- It would be useful to have tools that support the articulation of needs on a daily basis. How do teachers and pupils say, "I'm strong today, throw anything at me" or "today I'm fragile, leave me alone"? How can technology support the entitlement not to be consistent, and a system which is responsive to that?
- How can technology be used to connect students with human learning support outside of the school? For example, a personal tutor is important part of creative development. Does that personal tutor need to be within the school, or could the student videoconference regularly with a distant personal tutor throughout their school career? Could students take online lessons with distant experts?

2.2.4 Connecting to information

- ICT can be used to connect learners to information. We need to further develop tools for information search, archive, and retrieval, tools that can scour the world for resources to assemble those that are relevant for particular individuals, families, groups, communities. We need the semantic web.
- We need interactive directories. With a current directory, there is a huge amount of choice but the director is not interactive and there are few feedback loops.
- Where there are multiple possibilities, people need to be in an informed position to decide what to learn, when and how. Technology can provide content in flexible form that can be adapted to local content. Technology should not be fixed.
- We need to exploit the potential of digital technologies to offer access to new experiences through film, television, computer games, immersive realities, and simulations. All these can begin to allow someone to explore new ways of living and knowing, although this exploration should clearly not be linked only to technologically-mediated activities.
- While technology can provide opportunities to enter new networks, confidence enables you to take risks and look foolish in a new domain. People who are secure in one domain are more likely to take risks in another domain. We need tools and strategies to generate confidence.

2.3 Other points and issues

- A dialogue needs to be encouraged to enable designers and educationalists to learn from how children currently use technology, though the latter is always in development. Futurethink are doing a national audit of what young people know about using technology.
- Toshiba research on gaming found that if users do not get feedback on how they have done in a game within four seconds they no longer play it. This sort of research by telecommunications and computer companies, especially in the area of gaming with its cutting edge understanding of youth culture and how children interact with ICT, should be an important component of developing personalised learning through ICT.
- A co-productionist approach. Consumers as producers: not only accessing, but also producing content.
- It's important to use technology for things that technology is good for and identify types of learning that are better left 'un-technologised'. Social innovation can often be

as least as effective as technical innovation. Beware of techno-determinism, eg the proliferation of multiple choice questions, because that's what's easy for the technology.

- Technology for education should be aligned to the 'stage not age' maxim: beware of technological pre-packaging, designing fixed packages that students do when they're 8, 10, 15 etc.
- The paradox of innovation is that you put up barriers rather than take them down - battles can be very productive.
- ICT has a role to play around the interactivity of services; ICT allows you to aggregate, monitor, and calculate.
- How do we use the technology itself to motivate students to use the technology?
- How do we create a situation where ICT is the medium of forms of dynamic, personally relevant teaching, and not the just the object?
- Should students and teachers be learning the thinking behind the use of ICT and its enabling capacity, not just the practicalities of using software?
- In the near future, can we make more use of ICT for fact-based learning to free up teacher time to teach more subject processes and concepts? Should teaching become less about subject and facts and more about framework and ways of learning that can be applied to any subject?
- Industry has over-complicated the computer. Can user interface be redesigned to be tailored towards the education system such that everyone can access ICT?

3. Visions and pre-scenarios

A 10 year-old girl wakes up on a Thursday morning. Currently, she faces a school day governed by what society says that she ought to learn, when, where and how. Technology has a marginal role. In a personalised system in 2020, what kind of a day might she be looking forward to?

What might a personalised learning system look like? How might it be organised, and what would it hope to achieve? How might we get there?

Which questions should we ask first? Should we ask, how do children learn, and then base our ideas about a personalised system on our ideas about learning processes and important interactions? Should we progress from there to explore technology's optimal role in enhancing learning opportunities, thus avoiding techno-determinism?

3.1 Technology in 2020

Moore's law states that the speed of innovation doubles every 18 months, and in some areas of innovation this rate is being exceeded. Chris Yapp estimates that in 15 years - 10 technological generations - processes will run at about 1,000 times current capacity, and the speed of the communications network will increase by 5,000 times. We will have 2,000 times current storage, which by 2020 will be measured in yotabytes (1,024 bytes) We are also likely to see ubiquitous computing and smart dust, among many, many other things...

3.2 What should be the balance between personalised learning and externally designed curricula?

- Will we have a 50% core and then personalisation around the edges? One participant advocates a dual parallel system, in which you retain the system, but create opportunities for freedom within that, like sixth-formers having free periods which they can spend as they like, with diligent students normally rewarded by achievement.
- Another approach is to embed choice in multiple systems, so that students at stage one, for example, can have a bit of stage 10, not unlike students at Grade 8 violin working on Grade 4 piano. Such an integrated approach to the curriculum could be just as highly coordinated around progression, standards and progress. Tomlinson is starting this agenda by saying by 20X ? There will be 20 learning journeys, with flexibility across them.
- If we don't have a curriculum how do we regulate it? Issues at stake include: consistency, equality of opportunity, entitlement, comparable standards for assessment, and quality of the educational experience for students and teachers.
- To what extent should students be involved in the decision of what it is necessary to learn? Should the degree of participation correspond with age or stage? If learners are at the heart of the decision making process, will they learn all that is 'necessary'?
- Perhaps we could define subject areas and then ask students what they want to find out, and then use their responses as a framework for what teachers will deliver. A Swedish example was given in which whole classes voted for their areas of study each term from a range of topics offered by their history teachers.
- This raises interesting questions about the balance between singular and plural learner voice(s): we can have personalisation at the individual, group, class, year, or school level. There are many examples of people using an integrated approach to curriculum well, for example having three or four groups in a classroom doing three or four different things at the same time, while specialist schools do different things with an integrated curriculum. The accountability systems, QCA and Ofsted approaches, don't incentivise the specialist approach, but that is precisely the direction that curricula were going in the 1980s before the national curriculum was introduced.
- In private schools the curriculum is not obligatory - maybe something could be learned from an understanding of practices employed in the private school sector.
- How do we engineer the transition? Do we keep slimming the prescribed curriculum or do we radically overhaul the whole idea and describe an entitlement to content and skills for learner-led learning? Does entitlement vary by age and need and evolve over time? Perhaps the deterministic model gradually becomes replaced by a self-deterministic model as the learner gains the skills for independent learning.
- We need a cultural change amongst educational practitioners - how do you generate a wide sense of ownership of change? One way to bring teachers on board is to acknowledge good work that has gone on so far.
- Are schools getting in the way of students who are already personalising their learning? The spread of ICT has augmented students' access to resources that support their interests. Can teachers be aware of these alternative practices and work with them where students are pursuing those opportunities independently?

3.3 The inside is outside: education and the wider community

- Participation in knowledge-building communities is likely to be characterised by participation in multiple and overlapping communities. Schools are opening their membranes to two-way flows: schools are extending outwards into the community, while the community and wider cultural life is extending into the school.
- Bringing the outside in: teaching can be an activity with wide participation. If doing that, we need a better system of child protection, and we must acknowledge this in the final report. For example, learning assistants (normally teachers) need a licence to practice because they can inflict damage - in a society where we don't know everybody we need some recognisable standards.
- What might a wider learning community look like? In a more open model of education there is greater potential to use cultural resources to build learner confidence to drive their own learning. 80% of a child's life is spent somewhere else; a personalised system should try to tap into what's going on there.
- Wider community participation brings opportunities to move towards a more cultural form of assessment in which the student is assessed by members of the community within which they're learning.
- Supportive learning communities enable you to engage with particular groups of knowledge; what is the potential for some of those communities to be virtual?

3.4 Ideas

By enabling connectivity of voice, video and data irrespective of physical distance, ICT brings new connection opportunities. These opportunities have the potential to disrupt the way that we organise activities by time and space. Similarly, personalisation's capacity to fragment the existing lego-block system of classes, subjects and group timetables brings enormous challenges for systemic organisation. So how do we organise a personalised system?

In thinking about the practicalities of personalised education, we must consider the degree of flexibility that systems can provide before collapsing into malfunction.

3.4.1 Human resources online

- Digital technologies can be used to group expert knowledge in subject domains, available if people want to pursue those subject options. This knowledge can be stored as written, visual or audio resources, or as people/experts that the learner can video-conference with. Such experts could guide the learner to appropriate resources, or act as consistent mentors throughout the learner's schooling. If learners are connecting to a wide variety of online tutors, consistent learning relationships can become fragmented; what are the implications of that?
- Online learning consultants could be working from anywhere; for example, retired teachers could work as consultants this way, part-time and from home. Non-education professionals could give some time each week to be online learning consultants for advanced students in their area of expertise. We could even offshore online teaching support to India, for example, like online ICT support and banking.
- Involving members of a wider community in education through video streaming provides opportunities to open up education whilst guaranteeing students' physical safety.

3.4.2 Learning journeys and teaching resources

- In order to imagine a personalised system and related technologies, it may be useful to distinguish between different elements of learner activity and the specific needs related to each element. For example, we could distinguish between what might be termed 'learning roads' and 'learning junctions': junctions are the turning points in which new leaps and connections are made, decisions are taken and information and support is required; roads are the periods of work that build upon trajectories decided upon at the junction.
- Learners require support at the junctions, where they can be connected to new learning resource networks, be they human or informatic, where they may need support in accessing optimum resources from the range of opportunities available to them.
- Once on the road, learners need a quiet space where they can get on with some work as an individual or as a group, and the knowledge that help is on hand should they need it. By leaving students mostly alone on the roads, teaching resources are liberated to offer more personalised support to other students stuck at the junctions.
- Some personalised teaching systems already work this way, for example personalised teaching in prisons⁴.

3.4.3 Grouping by space

- To what extent could system flexibility allow learners to exercise greater control over the spatial organisation of their learning?
- Using online resources on personalised journeys could mean that children learning in the same space will increasingly be learning very different things, in different ways.
- Would we like a scenario in which students group in classrooms staffed by classroom assistants while they connect with teachers and learning communities online? Would students need to always be in a school to do this? Could students choose the space they work in, in or out of school, and the people they are working alongside?

3.4.4 Grouping by time

- To what extent could system flexibility allow learners to exercise greater control over the temporal organisation of their learning?
- Everything that involves other people must be planned to ensure effective coordination. There is greater scope for flexibility around solitary learning. What opportunities should a personalised system offer to students to organise their own timetable?
- If whole classes were available online, could the student just link into, for example, a 'Maths Curriculum 4 level 6.8' class whenever they felt like it? This is a provocative idea, suggesting fragmentation at best and chaos at worst, but it is interesting to think of possibilities.

⁴ In the classroom of San Quentin Prison in California, each student in the class works on a different subject at a different level. While one assistant holds order at the front of the class, two or three assistants work across the room, working with each student at a junction to help them onto the next learning stretch. Once safely established, the student is left to work alone while the teacher progresses to assist the next.

3.4.5 Other ideas

- Funding the learner - could we conceive of a system where you put the buying power in the hands of the learner? Students then become individuals with commissioning power who can buy packages of services. We could develop the baby bond into a learning bond. But do we really want a market place approach? Participants expressed concern about the commercialisation of education and information.
- Can you choose your teacher? Currently you're allocated a teacher.
- What can we learn from universities? The university model is an incredibly personalised system. The student chooses courses, attends lectures and seminars, organises their own timetable around them, and has access to personally consistent decision-making support.

4. Miscellaneous

4.1 Current obstacles

- Age 10 and above, it's not clear that there is any pay back on teachers. We have more British Nobel prizewinners with 3rds than 1sts, more millionaires that have dropped out of school than have finished it. We're lacking evidence of added value in the education system.
- The aims of education as we understand them don't equate with the language of personalisation: government needs to be open to that debate.
- Careers guidance is currently disastrous: we need to challenge preconceptions about who you are and what you want.
- Too much technology and no idea what to do with it?

4.2 Other

Useful binaries:

breadth	depth
humans	machines
FORMATIVE	SUMMATIVE
formal	informal
curriculum	assessment
individual	collaborative

What balance are we seeking to strike?

- Thinking about a personalised learning approach needs to be done within a framework of change and of readiness for change along at least three dimensions: social/cultural; knowledge; technology. The ways we interact, the ways we know, the tools we use. Flexibility and fluidity need to be key aspects of this rather than the development of fixed systems for future application.
- We can link the personalisation and ICT debate into the knowledge economy debate.

- The nature of knowledge is likely to change. It is useful to differentiate between subject knowledge - set in stone facts to learn, and Pedagogic knowledge which tends to be constructed by Ofsted and national strategies.
- Could we think of the Expert Learner the way we think of the expert patient, who uses personal research to develop greater knowledge of their condition than their GP and communicates with them asynchronously across distance using ICT?
- Personalisation signifies an enormous shift in responsibility: how can we ensure a healthy balance for the student between responsibility and safety?
- Route through knowledge networks - where do you come across inspiration?
- Michael Barber argues that the social science is clear: birth weight, height at age 7 and self esteem at 10 are far greater determinants of future achievement than any school qualification.
- How can your decision-making inform what is on the menu? For example, some service providers ask mothers how their first child will react to the arrival of the second, and offer them services on the basis of their answers. This puts a great deal of power with the intermediaries rather than the user.
- What would be failure in this agenda?