

Youth-led innovation

Enhancing the skills and capacity
of the next generation of innovators

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NESTA is the National Endowment for Science, Technology and the Arts.
Our aim is to transform the UK's capacity for innovation. We invest in early-stage companies, inform innovation policy and encourage a culture that helps innovation to flourish.

Executive Summary

In our challenging economic climate, young people will need to develop the skills and understanding to pursue and develop innovative solutions in both their own lives and for the organisations they join and create as the UK seeks new opportunities to meet the future. There has been little systematic analysis however of how and where young people innovate, or of how that innovation can be best supported and developed.

The focus of our research is youth-led innovation, whereby young people instigate potential solutions to a problem, often one that they have identified or defined themselves, and take responsibility for developing and implementing a solution. Our report analyses the research to date on youth-led innovation and identifies evidence of impact. It highlights that opportunities to participate in innovation increase young people's likelihood to innovate in the future and what helps or hinders youth-led innovation. We offer proposals for encouraging more young people to take part in youth-led innovation, which were developed with focus groups of young innovators and organisations that work with them. Alongside this research, the National Youth Agency and Changemakers have produced a NESTA guide for practitioners on youth-led innovation¹ and illustrative case studies.

We identified three domains in which youth-led innovation occurs

In the commercial/service domain, examples of youth-led innovation include the many fashions, music, software and design of services started by young people. The civic/political domain relates to citizenship and the right to participate on an equal basis in order to achieve this citizenship. The innovation may be in the process, its impact on public services or even a specific outcome such as a change in law. The cultural, subcultural or countercultural domain is where the more anarchic characteristics of young people are often played out, for example through music and fashion subcultures.

In each domain, examples of youth-led innovation range from those that are entirely youth-led, to those initiated by adults but taken over or influenced by young people. In any of these, the capacity for further innovation may develop. The domains are not mutually exclusive: what began through punk as a countercultural force was made commercially popular by record producers like Malcolm McLaren and designers such as Vivienne Westwood. More recently, games manufacturers have adopted as commercial features some innovations in computer games developed illegally by young people.

Young people's innovation can have major economic, cultural and social impact

In 2007, the UK's 7-19 year olds spent £13.9 billion; with clothes, computer games and 'going out' being major areas of spend.² In these sectors, in their search for the new, young people stimulate the demand for innovation and diffuse new cultural trends. Young people now play a formative role in computer gaming, where most computer games products offer producer-established online communities that innovate around the products. In the music and film industries, radical and disruptive innovations by young people as 'outlaw users', such as illegal filesharing, have forced major changes in the industries' products

1. The National Youth Agency and Changemakers (2008) 'NESTA: Youth-led Innovation – A guide for Practitioners.' London: NESTA.

2. Data from Mintel International cited in www.oft.gov.uk/news/press/2007/87-07 [Accessed on 9 February 2009].

3. The National Youth Agency and Changemakers (2008) op.cit. p.1.

4. Ibid.

5. UNICEF (2007) 'Child Poverty in Perspective: An Overview of Child Well-Being in Rich Countries.' Florence: UNICEF.

and business models. Young people have developed new technological processes, including languages for text messaging, online etiquette and new online social networks.

Young people have gained new rights through innovative civic activism, including a greater say in the running of many schools. Public bodies are also increasingly recognising the role of young people as users and service designers. Some local authority Children's Services have led the way in involving young people in public service design. In Trafford, for example, Evaluating Services Provided (ESP) has increased young people's awareness of services by awarding an ESP 'Youth Approved' standard to providers of services that successfully take part in a youth-led process of improvement.³

Young people's innovation skills can be developed from an early age

Young people can best develop the skills for innovation by receiving positive feedback and recognition for early successes and having opportunities to experience successful innovation for themselves. These experiences increase young people's confidence in their ability to identify problems and find solutions; life skills that are increasingly demanded by employers. Young people's innovation is usually associated with teenagers, but studies of younger children demonstrate the benefits of teaching design, problem solving or critical skills for developing the capability to innovate.

But young people who want to innovate face many barriers

The practical constraints of legal age restrictions on banking, setting up companies and applying for patents can act as barriers. Young people also face challenges in getting financial backing and support from being perceived as too inexperienced to be taken seriously. Galen Brown of Stromness in Orkney was 15 when he invented a device to save money and power when appliances are on stand-by. His biggest problems were not technical, but not knowing investors or licensees and his age, which limited access to business support.⁴

Social inequalities and living in rural communities can also create barriers, restricting young people from accessing the information and social networks that can help them develop their ideas. To use online networks and to gain access to the knowledge, resources and networks they need for innovation, young people need digital access. The 'disenfranchisement' of those whose families cannot afford broadband and computers can be a profound barrier for young people who have ideas.

Too much adult control can inhibit innovation

There are also more subtle barriers. Adults need to facilitate rather than teach innovation. Young people need the freedom to develop new ideas and concepts themselves. For adults to 'let go' or 'hand over' resources and decision-making requires sensitive handling and a degree of courage: young people themselves sometimes need to be challenged if their perceptions of authority inhibit them from taking the lead. Young innovators suggest that some teachers are too helpful; stifling students' ability to think for themselves. And, as adult innovators experience, new ideas can be ridiculed or ignored.

Negative cultural attitudes towards young people inhibit innovation

To be innovators, young people need to feel confident of the worth of their ideas and that their contribution is valued and can make a difference. Both the literature and our focus groups identified that negative attitudes towards young people are a major barrier to innovation. Recent research by UNICEF⁵ showed that the United Kingdom ranked bottom of the 21 industrialised countries in children's self-perceptions of well-being. Language can make a difference: negative media coverage that generalises about 'youth' and labels young people 'kids' exacerbates the problem.

There are opportunities in the curriculum to give greater support to young people's innovation

Some young people innovate without adult support through their curiosity and wish to engage with the world around them; but many more could be supported to do so through school leadership activities; through challenges to find innovative solutions to social, environmental, design or technical and scientific problems; within the primary curriculum and within the secondary curriculum, where GCSE, Diploma and other project work allows young people freedom to develop their ideas. For example, Emily Cummins' 'innovation career' was spurred by a project for a GCSE Resistant Materials class. She went on to do Product Design 'A' level, winning an award for a water transporter and later developing a fridge that does not use electricity.⁶

6. The National Youth Agency and Changemakers (2008) op.cit. p.1.

7. Ibid.

8. Ibid.

Networks have an important role to play in young people's innovation

Flexibility in the curriculum can foster young people's innovation; but encouragement in the wider culture and from youth organisations is equally important and can be developed through 'enabling spaces', social networks, role models, mentoring and support. There is a role for both online and more traditional networks, where young people can get the right advice and support both from their peers and where appropriate, from adults. Networks are also a good way of building links between inventors and potential sponsors. Sponsorship is crucial if an idea is to be brought to life – or moved from invention to innovation. Matthew Brown was 12 years old when he started the Movement Against Sectarianism In Football (MASIF) after posting a message on a blog about wanting to stop supporter violence. This was seen by Michael Boyd, Head of Community at the Irish Football Association, who put Matthew in touch with the UnLtd grant scheme that enabled him to set up the project.⁷

Young people are more innovative where they are able to gather and bounce ideas off one another and collaborate with others to develop new concepts. Some young people have developed their own networks. Hear My Voice, for example, offers residential weekend courses and a website where young Muslim women can blog, write articles and join in the discussion forum.⁸ Some innovative firms now host websites where young users can interact and support each other, and many other communities of users emerge spontaneously.

We identified six major ways in which policymakers, schools and youth organisations can help

Creating an 'innovation culture' in the UK that supports and celebrates the role of young people in innovation requires a long-term cultural shift. Our focus groups counselled us strongly against producing a single recipe for innovation; but much can be done in the shorter term to enable young people to contribute more to innovation and to develop the skills they need to be the successful innovative employees, employers and citizens of the future.

1. Encourage the use of national and local media to promote positive images of young people and youth-led innovation. This could be addressed in three ways: encouraging programme makers to create opportunities for youth-led production of radio and television programmes; extending the number of schools and youth groups who develop their own radio and television stations as a vehicle for youth innovation; and youth organisations and public bodies working together to target the media to celebrate the ways in which young people make a positive contribution.
2. Develop Innovation Toolkits aimed at young people to provide the process and structure to support them to develop innovations. For example, Toolkits could support innovation in the school curriculum, in the use of space in residential homes and in health services. To avoid duplication and identify gaps, an audit is needed of currently available Toolkits. New Toolkits should be properly targeted with young innovators leading and managing their development.

9. The Integrated Qualifications Framework (IQF) will be a set of approved qualifications that aims to allow progression, continuing professional development and mobility that supports shared values and learning approaches across the whole of the children and young people's workforce. Available at: <http://www.iqf.org.uk/> [Accessed on 13 February 2009].

3. Provide access to networks to support young innovators. Target the development or extension of existing social or business networks to offer support, mentoring and advice for young people who want to develop innovative products, services and initiatives. These need to be inclusive to address the innovation gap. This might be done through partnering with organisations that run business or professional networks.
4. Provide more staff development for adults who work with children and young people on how to support youth innovation through influencing the development of the Integrated Qualifications Framework;⁹ and through providing Toolkits for educators, youth workers and other adults who work with young people. Both initial professional training and continuing staff development need to address these issues.
5. Provide 'spaces' and 'places' to support young people's innovation. 'Spaces' can be opportunities or challenges, both within the school curriculum and outside formal education, that enable young people to exercise their problem-solving, open-thinking and teamwork skills on issues that they identify as important. Spaces can also be virtual ones that enable young people to collaborate, test out their ideas and get support. 'Places' can encompass existing initiatives such as school councils and the Youth Parliament, which could be extended beyond their consultation and participation role to take on a stronger youth-led focus that enables young people to assume leadership roles in management and governance. These should aim to embed innovation opportunities inclusively rather than create separate structures that only some young people can access.
6. Recognise, celebrate and reward organisational support for youth-led innovation through existing 'badging' schemes such as specialist schools, extended schools and eco-schools. Within these and other schemes, greater priority could be given to supporting youth-led innovation. Furthermore, potential support and 'advocacy' for young people to innovate could be made more identifiable and coherent by creating opportunities to bring together the disparate organisations that campaign on behalf of young people. The United Nations Convention on the Rights of the Child provides the context in which young people can expect to exercise their rights to public services and citizenship.

More evidence is needed about 'what works'

Our research identified a number of ideas for programme development and future research. However, in order to build on the evidence base and maximise coherence, the first priority would be to pilot and evaluate work relating to one or more of the six proposals above.

Acknowledgements

We are very grateful to the following who contributed to the focus group discussions in Sussex, London and Sheffield.

Jamal Maxey	University of Sussex
Dawa Dem	University of Sussex
Sanjay Jothe	University of Sussex
Raj Anand	Kwiqq.com
Alev Zahir	Edge Learner Forum
Nick Hagan	Edge Learner Forum
Stephen Frost	Envision
Helen Thomas	Envision
Sabirul Islam	The World at Your Feet
Luke Lancaster	Young Pioneers
Peter Lancaster	Young Pioneers
Debi Roker	Trust for Study of Adolescents
Ciara Davey	CRAE
Suzanne Philips	The Kent Foundation
Rachel Urquhart	Envision
Abi Bulley	Changemakers
Nick Micinski	Commission for Youth Social Enterprise
Peter Ptashko	UnLtd
Abby Kegg	UnLtd
Ruth Amos	Steady Stairs
Mike Garnock-Jones	BiG Make it Your Business (LEGI) Sheffield
Grace Haughian	University of Sheffield
Laura Synnuck	Children and Young People's Empowerment Project
Leroy Williamson	Sheffield Youth Council

Thanks are also due to Theresa Crowley, Gerard Darby and Maria Estevez for their continued interest and support and Brian Parkinson for IT and technical support.

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About the research

10. The National Youth Agency and Changemakers (2008) op.cit.

What the research was designed to achieve

The research looked at what has been written about youth-led innovation and identified evidence of impact. It highlighted whether innovation increases the likelihood of further innovation and what helps or hinders youth-led innovation. A framework was drawn up to show how youth-led innovation might work in order to help others support and encourage it to happen. Proposals for taking it forward were developed. Alongside this research, the National Youth Agency and Changemakers have produced a NESTA guide for practitioners on youth-led innovation¹⁰ and illustrative case studies.

How the research was done

Electronic databases, websites and references listed in available publications were searched for relevant books and papers (see the Appendix for more details and for the databases and search terms used). Over 500 references were then screened using the criteria in the Appendix, which identified 65 publications for the review. Further literature that has informed the report, some of which provided empirical evidence, is also referenced.

Four focus group discussions were held, one in Sussex, two in London and one in Sheffield with young innovators and representatives from organisations and companies supporting youth-led innovation. At each, the research team presented the main findings from the literature review together with the emerging framework and recommendations. Detailed notes were made at each focus group and points raised are incorporated into this report. Two experienced youth consultants working with the project team facilitated the focus groups and provided ongoing 'reality checks' for the researchers during their discussions of the findings.

1. Young people's role in innovation is of increasing interest to policymakers

Innovation policy in the UK is changing in response to concerns about the productivity and competitiveness of the economy and the quality and effectiveness of public services.¹¹ Seen traditionally as a matter of research, development and commercialisation by inspired managers in business, innovation is now understood to be a process that occurs across the wider economy and society. Whilst traditional innovation continues to attract public investment, there is now increasing interest in identifying and supporting 'new sources of innovation'.¹² Such new innovation is as likely to originate from users of products and services as from inventors and managers in the commercial or public sector. New technology and increasingly wide access to it are also helping to create the conditions for more open approaches to innovation, as well as for the systems that generate and sustain change.

The Government's *Innovation Nation* White Paper strap-line is 'unlocking talent'. Policymakers are keen to put this into practice, by developing drivers of innovation at all levels. This commitment can be seen as much in the current policies and plans for children's services¹³ and workforce development¹⁴ as in those for the manufacturing industry.¹⁵ In both cases, interest and investment focus on how users or consumers can help to design and deliver services and products – and the innovative processes used to do so. In Medway, the Council consulted over 700 children and young people from schools, young offenders, members of youth clubs, and children from a faith group in order to inform the production of the Children and Young People's Plan.¹⁶

This commitment was also reflected in the *Youth Matters* Green Paper¹⁷ that emphasised the need to engage more young people in positive activities and empower them to shape their services. The Green Paper suggested that young people should have more influence over what is provided in their area, be more involved in planning and delivering services and have more opportunities to express their views. *Youth Matters* also recognised the need to provide better support to young people at times of transition, whether from primary to secondary school, or from secondary school to further education, training or work. These decisions were acknowledged¹⁸ to have major effects on their future wellbeing and on their capability to contribute to society.

Concerns about children's well-being were heightened by the 2007 UNICEF report *Child Poverty in Perspective: An overview of child well-being in rich countries*.¹⁹ It drew on 40 indicators of children's lives and rights, and concluded that the United Kingdom ranked bottom of the 21 industrialised countries in the study. Children's self-perceptions of well-being were particularly poor in the UK. The report again noted their vulnerabilities at times of transition.

Contemporary policy on developing private and public sector innovation in the commercial and service sectors must be seen as one aspect of government commitment to as to the rights of 'active citizenship' that has led to wider civil or civic renewal.²⁰ In recent years, citizenship in the UK has become defined as much by reference to the duties and responsibilities of

11. DIUS (2008) 'Innovation Nation.' Cmd 7345. London: The Stationery Office.
12. *Ibid.* p.5.
13. DCSF (2008a) 'The Children's Plan.' London: DCSF.
14. DCSF (2008b) 'Children's and Young People's Workforce Strategy.' London: DCSF.
15. DTI (2003) 'Innovation Report. Competing in the Global Economy: the Innovation Challenge.' London: DTI.
16. Medway Council Cabinet (2006) 'Report presented on the Children and Young People's Policy Framework.' Medway: Medway Council. Available at: www2.medway.gov.uk/FTP/Cabinet_Decisions/is985/reports/report_985_1411.doc [Accessed on 5 January 2009].
17. DfES (2005) 'Youth Matters.' London: DfES.
18. *Ibid.*
19. UNICEF (2007) *op.cit.* p.6.
20. Jochum, V., Pratten, B. and Wilding, K. (2005) 'Civil renewal and active citizenship: a guide to the debate.' London: NCVO.

21. Willow, C., Marchant, R., Kirby, P. and Neale, B. (2004) 'Young children's citizenship: Ideas into practice.' York: Joseph Rowntree Foundation.
22. Kirby, P., Lanyon, C., Cronin, K. and Sinclair, R. (2003) 'Building a Culture of Participation. Involving children and young people in policy, service planning, delivery and evaluation.' Nottingham: DfES Publications.
23. DfES (2003) 'Every child matters.' Cmd 5860. London: The Stationery Office.
24. Benton, T., Cleaver, E., Featherstone, G., Kerr, D., Lopes, J. and Whitby, K. (2008) 'Citizenship Education Longitudinal Study (CELS): Sixth Annual Report. Young People's Civic Participation In and Beyond School: Attitudes, Intentions and Influences.' London: DCSF.
25. Bragg, S. (2007) 'Consulting young people: a review of the literature.' London: Creative Partnerships, Arts Council England.
26. Kirby, P. and Bryson, S. (2002) 'Measuring the Magic? Evaluating and Researching Young People's Participation in Public Decision Making.' London: Carnegie Young People Initiative.
27. Whitty, G. and Wisby, E. (2007) 'Real Decision Making? School Councils in Action.' London: DCSF.
28. DCSF (2008c) 'The Independent Review of the Primary Curriculum: Interim Report.' (Sir Jim Rose Review). London: DCSF.
29. Demos (2007) 'Ready for the future: young people's views on work and careers.' London: NESTA/Demos.
30. Whitty, G. and Wisby, E. (2007) op.cit. p.13.
31. UNICEF (2007) op.cit. p.6.
32. DCSF (2008d) 'Working together: Listening to the voices of children and young people.' London: DCSF.

individuals. Chief amongst them is the responsibility to participate as partners, not only in the provision and use of public services, where this idea has become a central motif, but also in the democratic process more widely.

Moreover, the idea of an active and participative citizenship has now been extended to children and young people.²¹ Their responsibilities as young citizens have been validated in policies that require and enable their participation in the design and delivery of services^{22, 23} including actively contributing to the life of their school.²⁴ However, as Bragg²⁵ and Kirby and Bryson²⁶ note, the assumption that involving young people in the planning of services will improve their quality has rarely been investigated. Their rights to participate are also being extended in legislation, both in education and for children in care. The campaign to have their views enforced as well as heard is growing in strength. So, it is as important that we develop the talents of young people to innovate just as much as those of adults. After all, they are not only increasingly influential consumers of goods and users of services, but also becoming active citizens.

Citizenship was introduced into the school curriculum in 2000 and was made statutory for 11-16 year olds from September 2002. The subject is aimed at encouraging pupils to develop sound principles of freedom, democracy, equality, justice and peace. The knowledge and understanding covered by the citizenship curriculum includes democracy, and individual's rights, responsibilities and position within society. In this context, the development of school councils has been encouraged, as a means of representing pupils' views within schools and Whitty and Wisby report²⁷ that 95 per cent of schools now have such structures.

Recent developments in the school curriculum, such as new 14-19 diplomas, the updating of GCSEs and A-Levels and an expansion of Apprenticeships, suggest increasing flexibility in the curriculum and qualifications offered. Greater opportunities for work experience and more emphasis on critical thinking skills and teamwork should allow for greater innovation. The recently published interim report of the Rose review of the primary curriculum,²⁸ recommends greater flexibility in the curriculum to give more emphasis to 'skills for life' including communication, teamworking and problem-solving; skills that Demos said are identified repeatedly as priorities by employers.²⁹

Whitty and Wisby's³⁰ school councils study made recommendations pertinent to the UNICEF findings,³¹ noting that pupils need training to participate meaningfully in their schooling. These findings informed the DCSF guidance, *Working together: Listening to the voices of children and young people*.³²

2. What is youth-led innovation?

In scoping and shaping definitions of ‘youth-led’ innovation, we need to clarify the different claims made by young people and others on their behalf about the nature and purpose of their innovative practices. In particular, contrasting perspectives about ‘youth’ challenge the commercial understanding that innovation is a managed process, and must always be so.³³ ‘Youth’ as an idea, as well as a life stage, is increasingly understood to be something in which to invest. This is exemplified in the inclusion of youth in the innovation discourse and the search for the right environment for them to participate and show enterprise.

The definition of ‘innovation’ given in the commissioning brief was:

The development and dissemination of a new product, service or process that produces economic, social or cultural change.

This can be distinguished from ‘invention’ defined as:

The first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out into practice. There is often a considerable time lag between the two.³⁴

‘Entrepreneurship’ is about the skills and resources needed to progress invention into innovation and, citing Schumpeter, can be defined as:

The ability to turn an invention into an innovation through the combination of several different types of knowledge, capabilities, skills and resources.³⁵

We have taken ‘innovative’ to apply either to the initial idea or to any part of the implementation process – or to both. It is important to recognise that young people may instigate new ideas, but they also play an important role in some sectors as early adopters who stimulate the demand for innovative products and services. The research on ‘diffusion’^{36,37} argues that there is only a small number of ‘real innovators’ who identify new ideas and behaviours; but an important role is also played by ‘early adopters’, a slightly larger group who decide whether to follow the innovators’ lead. If they do, the trend grows and is taken up much more widely.

Youth-led innovation can encompass both incremental and radical innovation.³⁸ Many radical innovations emerge from outsiders, whereas incremental innovations often emerge from those closely involved in the day-to-day use of a particular good or service. Most innovation tends to be incremental, with the less frequent radical innovations potentially shaking things up. If adopted, such radical innovations can become disruptive to the traditional market, just as filesharing forced changes in the music and film industries.

33. Bessant, J. and Tidd, J. (2007) ‘Innovation and Entrepreneurship.’ London: Wiley.

34. See www.nesta.org.uk/invention

35. See www.nesta.org.uk/entrepreneurship

36. Heath, J. and Potter, A. (2004) ‘The Rebel Sell: How the Counterculture became Consumer Culture.’ Mankato: Capstone.

37. Rogers, E. (2003) ‘Diffusion of Innovations.’ 5th ed. New York: Free Press.

38. Freeman, C. (1982) ‘The economics of industrial innovation.’ 2nd ed. London: Frances Pinter.

39. Bessant, J. and Tidd, J. (2007) op.cit. p.14.
40. Barker, K. (2004) Diffusion of Innovations: A World Tour. *Journal of Health Communication.* 9 (6 supp 1), pp.131–137.
41. Fullan, M. (2007) *The New Meaning of Educational Change.* New York: Teachers College Press.
42. Hart, R. (1997) *Children's participation.* New York/London: UNICEF/Earthscan Publications.
43. Stoneman, P. (2007) *An Introduction to the definition and measurement of soft innovation.* NESTA Working Paper. Available at: http://www.nesta.org.uk/assets/Uploads/pdf/Working-paper/soft_innovation_working_paper_NESTA.pdf [Accessed on 13 February 2009].
44. Ibid. p.11.
45. Ibid.
46. Flowers, S. (2008a) *The New Inventors: How users are changing the rules of innovation.* London: NESTA.
47. DIUS (2008) op.cit. p.12.
48. Castells, M. (1996) *The Information Age: Economy, Society and Culture.* Cambridge, MA: Blackwell.
49. von Hippel, E. (2005) *Democratizing Innovation.* Cambridge, MA: The MIT Press.
50. Flowers, S. (2008b) *Harnessing the Hackers: The emergence and exploitation of Outlaw Innovation.* *Research Policy.* 37, pp.177–193.
51. Lessig, L. (2004) *Free Culture: How big media uses technology and the law to lock down culture and control creativity.* London: Penguin.

The literature on innovation in general suggests that ideas, which initially may be regarded as unusual or marginal by people other than those proposing them, are often subsequently brought into the mainstream.³⁹ Many technological developments and types of music, for example, may be poorly received when initially proposed, but later become widespread and embedded in the culture. A successful commercial or service innovation requires the initial idea to have become widely available, though originally, it need not be inherently or overtly commercial.

Young people can also contribute to diffusion of innovation in the sense proposed by Barker to argue that when innovation is embedded in the culture of an organisation, it may happen continuously and become the norm.⁴⁰ This is similar to the concept of 'continually improving schools' described by Michael Fullan: such schools are characterised by professional learning within a culture of continuous reflection, deliberation and change.⁴¹

While the work on 'ladders of participation'⁴² developed to describe different levels of young people's involvement in decision-making in schools and other bodies should be acknowledged, it has not been included in this review. Our definition of innovation requires the development of a product, service or process beyond merely being involved. Furthermore, the literature supports the contention that the development of participation is not a linear process as implied by 'ladder' models.

Our definition includes soft innovation as discussed by Stoneman – aesthetic rather than functional changes in products.⁴³ A soft innovation might look, feel, smell or taste differently and might be a new perfume, car design, musical recording, or changes in fashion. The launching of new products represents soft innovation "if those products are aesthetic or offer different aesthetic characteristics from products already on the market".⁴⁴ Soft innovation differs from some of the more functional approaches and definitions of innovation and previously was often excluded from studies of innovation.⁴⁵

The definition of youth-led innovation describes the role that a young person or group of young people take in this process:

... instigating potential solutions to a problem, often one that they themselves have been at least partly responsible for identifying or defining. The young people take responsibility for coming up with the solution and also implementing it.

This view of the young person proposing and implementing the solution is similar to that proposed in user-centric models of innovation.⁴⁶ As such, it differs markedly from the traditional view of the 'supplier' as the source of innovation and the user as the potential market for output. *Innovation Nation* argued that more effective products, services and delivery require new ideas from the public and private sectors, users and professionals.⁴⁷ It acknowledged that innovation is driven by demand as well as supply and that this is reflected in the need to involve users in innovating collaboratively in business and public services. The distinction between user and producer becomes increasingly blurred in democratised innovation:

... some users are able to develop and extend technologies and the distinction between user and producer, or 'users' and 'doers' as Castells would have it,⁴⁸ essentially disappears. The emergence of this behaviour has led to what has been termed a democratising of innovation.^{49,50}

Youth-led innovation may also reconnect to an earlier folk or craft-based approach to culture and society that stands in contrast to the more contemporary view of users whose involvement in popular culture is simply as consumers.⁵¹

The focus of this study has mainly been on young people of school age, but it is important to recognise that 'youth' is a contested social category and not simply a statement of age range. The distinctive nature of 'youth' emerges from some of the evidence reviewed here. How this distinction is defined continues to be debated.⁵² Matthews, for example, suggests that the notion of 'youth' is unhelpful – a “monolithic social category ... obscuring different levels of interest, knowledge and involvement”.⁵³ In this report, we try to draw out where the distinctiveness of youth is helpful in understanding youth-led innovation, without assuming 'youth' to describe a homogeneous group the members of which share all common characteristics.

A developmental perspective assumes that the young person's capability to innovate increases with age and is acquired or developed in the transition to adulthood. This view implies that attention should be given to the role of adults and existing organisational structures in creating the capacity within which this capability can be realised.⁵⁴ From a human rights perspective, 'youth' is seen as a social rather than a biological life stage. From this position, the starting point is the recognition of the rights of young people, including a right to participate actively as citizens and an expectation that they can do so. Finally, and irrespective of the balance struck between developmental needs and citizenship rights, it is important to recognise 'youth' as being a cultural process too.

Whilst the age boundaries may change in accordance with time and place, there is now a universal recognition that 'childhood' and 'youth' are constituted within social 'spaces'.⁵⁵ These spaces are constructed partly by adults as they seek to develop the next generation, for example within schools, colleges and universities. This objective is central to the developmental perspective and much innovation literature addresses changing perspectives on this socialisation in an increasingly competitive world. But young people themselves also create spaces, leading to the recognition that 'youth' can be understood as a cultural, or subcultural, process. For Moss and Petrie, the 'spaces' of childhood and youth are best seen as “predominantly sites for civic participation, with technologies at the service of those who frequent them, rather than a conduit through which such technologies are applied to local populations on behalf of the state”.⁵⁶ More generally though, childhood and youth culture are actively constructed across a range of contexts and through a variety of media. Innovative approaches may occur in any of these places.

52. Prout, A. (2005) 'The Future of Childhood. Towards the interdisciplinary study of children.' London: RoutledgeFalmer.
53. Matthews, H. (2001) 'Citizenship, Youth Councils and Young People's Participation.' *Journal of Youth Studies*: 4 (3), pp.299-318.
54. In this report we refer to capability as the characteristics of individuals or groups that enable them to innovate. This includes their motivation, interests, skills and the developmental changes that may occur to these over time. By contrast, capacity is used to describe that which enables the capability to be exercised. So, capacity to innovate might be increased by any of the facilitators identified in this report, such as support of various kinds, attitudes of others, social networking and access to resources. Capability can be developed and capacity increased in each of the areas or 'domains' of innovation that we identify.
55. Moss, P. and Petrie, P. (2002) 'From Children's Services to Children's Spaces: Public Policy, Children and Childhood.' London: RoutledgeFalmer.
56. *Ibid.* p.113-114.

3. We identified youth-led innovation in different sectors and contexts

57. Shah, S. (2000) Sources and Patterns of Innovation in a Consumer Products Field: Innovations in Sporting Equipment Massachusetts Institute of Technology 'Sloan Working Paper #4105.' Boston: MIT. Available at: <http://opensource.mit.edu/papers/shahsportspaper.pdf> [Accessed on 9 December 2008]. p.12.

58. Ibid. p.2.

There are three distinct domains in which youth-led innovation occurs

In order to develop a framework of innovative behaviour – and to consider how best to support it – we need also to understand 'youth' as a context for development, citizenship and culture. Context refers here to the areas of political, social, economic and cultural activity as well as the specific market and service sectors in which innovation might take place. The literature falls broadly into the three domains identified as commercial/service, civic/political and cultural/subcultural in Figure 1.

In the commercial/service sphere, young people are consumers and producers of goods and services, which can be provided through private, public, voluntary and not-for-profit sector organisations and agencies. In this sphere, we are interested particularly in the innovative nature of the processes of consumption and production within an organisational setting. In the civic/political domain, young people are understood first as citizens and we are interested in the innovative nature of their civic engagement and political activism. The third domain identified is cultural, subcultural or countercultural activity in which the more anarchic characteristics of youth are often played out, such as the 'flower-power' culture of the 1960s. Commercial or civic spin-offs from such cultural activity can take place in fashion (flared trousers), music (American West Coast) and diet (macrobiotic) or anti-war activism.

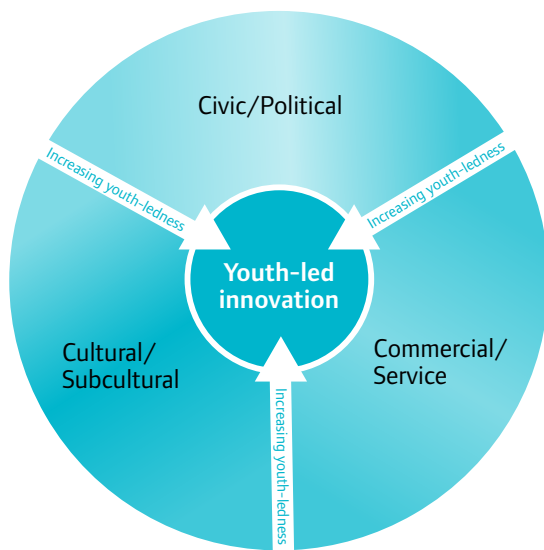
In each domain, examples of youth-led innovation range from those that are entirely youth-led, to those initiated by adults but influenced or appropriated by young people. In each domain, the process of innovation occurs and the capacity for further innovation may develop. The types of innovation in each domain are discussed in turn.

Domain 1: The commercial and public service sectors

Some individuals' talents or successes lead them to become involved in innovation in sports, music, creative and performing arts or as commercial entrepreneurs. Often they are 'lead-users' who have a "high need for an innovation and they experience that need ahead of the bulk of the target market".⁵⁷ Their motivation might involve trying to outshine their peers, seeking admiration or pushing the limits of existing boundaries or technologies in the field. Some might simply be interested in making money. Generally, youth-led innovation in this domain involves less challenge to the status quo than that in either of the other two domains. Often, lead-users innovate where the market demand has not been established.

Skateboarding, snowboarding and windsurfing are good examples. Shah's study of innovation in sporting equipment for these activities shows that most innovations were not introduced by large companies, but "developed by a few early and active participants in the new sports – lead users who built innovative equipment for themselves, their friends".⁵⁸

Figure 1: The three domains of youth-led innovation.



Typically these lead-users were ‘very young’ in their teens or early twenties and technically unsophisticated. Often they worked together to develop innovations:

*... it [innovation] was happening daily and we were all helping each other and giving each other ideas, and we’d brainstorm and go out and do this and the next day the guy would do it a little better...*⁵⁹

The process of innovation involved these lead-users testing out the products:

*They evolved their innovations via learning-by-doing in their novel and rapidly evolving fields. They would begin by building a prototype using simple tools and materials, immediately try it out under real field conditions, discover problems, make revisions within hours, and then try again.*⁶⁰

Many went on to build businesses from their products, often to support their sporting activities. Some of these became leading companies in their field; others closed as the innovator followed other lifestyle choices. Shah gives the example of ‘the Hawaiians’, a group of up to seven people in their early twenties who lived together in a house in Kailua, Hawaii in the 1970s. They windsurfed daily in high wind and wave conditions, creating various windsurfing techniques and tricks for the wave conditions. “New needs emerged – needs that the existing equipment could not fulfil. They created innovations in windsurfing equipment in order to tailor the equipment to the techniques and conditions they were experiencing.”⁶¹

Other examples relate to online computer gaming communities. Jeppesen and Molin’s study showed how lead-users work together to stretch the boundaries of existing games.⁶²

But not all commercial youth-led innovation is about new products. Innovation in product or service design is just as important. Two types of design can be distinguished: those where organisations tap into innovative young people and use their ideas to enhance product design and promotion; and those in which adults work with young people to develop products or services and enhance their innovation skills. Whilst generally the latter has the aim of developing products for the benefit of youth, the first example attempts to generate (and sell) products for the organisation. Examples of the latter are third sector organisations assisting young people to set up ethical businesses, as described in Rolfe and Crowley.⁶³

59. Larry Stanley, windsurfer, quoted in Shah, S. op.cit. p.14.

60. Ibid. p.3.

61. Ibid. p.11.

62. Jeppesen, L. B. and Molin, M. (2003) Consumers as co-developers: learning and innovation outside the firm. ‘Technology Analysis and Strategic Management.’ 15, (3), pp.363-383.

63. Rolfe, H. and Crowley, T. (2008) ‘Work-related Learning for an Innovation Nation.’ London: NESTA.

64. Heath, J. and Potter, A. (2004) op.cit. p.14, p.220.
65. Mason, M. (2008) 'The Pirate's Dilemma: How youth culture is reinventing capitalism.' London: Free Press.
66. Moses, L. (2007) Spring Look. 'Media Week.' 19 February 2007.
67. Shah, S. (2000) op.cit. p.17.
68. See www.young-enterprise.org.uk
69. Rolfe, H. and Crowley, T. (2008) op.cit. p.18.
70. Sebba, J., Brown, N., Steward, S., Galton, M. and James, M. (2007) 'An investigation of personalised learning approaches used by schools.' Nottingham, DfES Publications. p.26.
71. Druin, A. (2002) The role of children in the design of new technology. 'Behaviour and Information Technology.' 21 (1), pp.1-25.
72. Druin, A. and Fast, C. (2002) The Child as Learner, Critic, Inventor, and Technology Design Partner: An Analysis of Three Years of Swedish Student Journals. 'International Journal of Technology and Design Education.' 12(3) pp.189-213.
73. Cairncross, S. and Waugh, S. (2005) Involving Preschoolers in Design of Interactive Multimedia for Learning: An Activity-Driven Approach. In Kommers, P. and Richards, G. (eds.) 'EdMedia: Proceedings of the 17th annual World Conference on Educational Multimedia.' pp.1117-1124. Vienna: Association for the Advancement of Computers in Education.
74. Nettet, V. and Large, A. (2004) Children in the information technology design process: A review of theories and their applications. 'Library and Information Science Research.' 26 (2) pp.140-161.
75. Ibid. p.141.

Companies seek out new products or adaptations of products they hope will be the next 'big thing'. Some organisations put together 'cool reports' which keep "tabs on youth culture, monitoring what the innovators are doing and noting how the early adopters are reacting".⁶⁴ Others enlist the services of young innovators to help identify new trends before they become part of the mainstream. Mason reports on innovation that arises from individuals who start fashions that are taken up and developed by others, creating movements or trends.⁶⁵ Moses describes how the magazine *Your Look*, aimed at teenagers interested in a similar mix of beauty and fashion news to that already available in the original *In Style* magazine, allows readers to upload their own fashion photos through its presence on the MySpace social networking website. By doing so, *Your Look* both creates future buyers of *In Style* and ensures that readers' voices are heard.⁶⁶

Shah suggested it was difficult for sports equipment organisations to link to the innovation process: innovators in their study were young and did not have a college education. Instead, some manufacturers hired lead-users as consultants or teams of gifted sports practitioners to tour the country to demonstrate the equipment. They then tested any new equipment models developed by the manufacturer.⁶⁷

Where adults work with young people to develop products or services and enhance their innovation skills, adults create the space within which young people innovate. In this sense, these examples build both young people's capability and capacity in the system. The Young Enterprise Scheme, which brings volunteers from business into the classroom to work with teachers and students to improve young people's entrepreneurial skills, is an example.⁶⁸ Rolfe and Crowley, drawing on research on how employers engage in work-related learning, noted that some schools and colleges used innovative approaches including business enterprise challenges, involving employers in teaching, regeneration projects and design. Very often these activities were student-led.⁶⁹ There are also many cases where pupils have been involved in redesigning school playgrounds or equipment. In Sebba *et al.*, we describe a primary school where the pupils were asked to evaluate the learning potential of the local museum and make recommendations for its redesign:

I asked the children to go on a trip ... to evaluate the museum. They went for a typical morning and then in the afternoon we put them into groups and they evaluated positives and negatives of their experience and what they'd like to see improved. Each group prepared a speech for the museum staff, curator and management of the museum to listen to... All the things that the museum staff had never thought of, because they're evaluated by adults for adult provision. (Primary case study interview, senior manager)⁷⁰

Further evidence about innovation in design activities comes from Druin and Fast who describe how in Sweden, young children help to design new storytelling technologies.^{71,72} One child suggested a storytelling machine which led adults and children to design low-tech prototypes. Similarly, Cairncross and Waugh drawing on Druin and Fast's research, looked at use of multimedia in maths activities with preschoolers.⁷³ They noted that while children's ideas were welcomed as informing design, selection of which ideas to develop was usually led by adults on the justification that not all ideas put forward by children are workable and that they might conflict with pedagogical goals.

Information technology has produced further examples of adults undertaking the initial design, with children involved later in the process. Nettet and Large suggest that software companies often employ adults to test the usability of their products as children are seen as too unruly or difficult.⁷⁴ If children are involved, they are observed, recorded and analysed by adults who thus make the decisions and maintain control. This raises issues about the power relationship between adult and young person in the innovation process:

... because the users, whether adult or child, are only involved after the technology has been designed, they have little or no control in the process.⁷⁵

In some cases companies provide spaces for youth innovation. Such spaces often rely on new technologies and are (often discreetly) branded around key products of potential interest to young people. In this way, companies provide some sort of social function, whilst appealing to the youth market. The innovation might be a side-product or an integral part of the operation.

Jeppesen and Molin describe online computer gaming communities where consumers “communicate and exchange ideas and software that extend the game from its original shape”.⁷⁶ They explain how companies can encourage and tap into these communities in order to enhance product-life and generate new product ideas, at minimum cost. One approach involves a ‘product space’, where consumers can interact online and organisations can talk to consumers; 83 per cent of all computer games products offer producer-established online communities.⁷⁷ In these spaces, groups of consumers innovate around products; they might develop new features which become available online, which other consumers can download. Companies in turn might contact and deal directly with individuals who have ideas they wish to pursue further.

This is explored further in Flowers:

The involvement of (firm-level) users in firms’ product development processes by developing and distributing supplier-designed ‘toolkits’, enabling users to engage in innovation by developing their own custom products (von Hippel and Katz, 2002;⁷⁸ Thomke and von Hippel, 2002⁷⁹) has been explored, although their role in influencing the direction of user innovation is less clear.⁸⁰

A previous report to NESTA showed how the Microsoft XNA toolkit enabled young people to create their own games without having to be able to program, and this then enables them to ‘publish’ their games.⁸¹ This is now common in the gaming world and an important contribution to youth-led innovation as it increases capacity to innovate by lowering barriers.

Another commercial company, Red Bull, has developed a social-networking site aimed at fostering innovation and providing young consumers with support for their ideas.⁸² The Flugelbinder site, which discreetly carries Red Bull branding, allows users to create a Thought Locker — a profile page, where they can securely store ideas, photos and business proposals. Ideas can also be ‘banked’ there via email or SMS. Those signing up to the site can browse others’ ideas, chat to like-minded users and access articles on how to bring their plans to life. It also features brain-teasers aimed at fostering innovation. The project was developed in partnership with youth marketing agency *Livity*.

Domain 2: Civic engagement and political activism

Civic engagement and political activism can create opportunities for young people to develop innovative ideas that benefit their communities and society. There is an extensive contemporary literature on civic engagement and political activism amongst young people, especially in the US.⁸³ The ‘civic’ nature of engagement and activism derives from the idea of the citizen being a member of a political community. However, what counts as ‘political’ varies in the literature as does the definition of the ‘community’ in question. Civic participation by young people is defined as that which is facilitated and shaped as part of the socialisation process for young people (including school councils and community volunteering schemes). It can also include action that is taken independently (such as voting and campaigning). In the first case, citizenship is something that is transmitted indirectly through mechanisms designed for the purpose. In the second case, it is something that is claimed directly by young people acting as members of a wider community. The intention is

76. Jeppesen, L.B. and Molin, M. (2003) op.cit. p.363. This article is not specifically about youth but young people figure highly in these communities.

77. Ibid.

78. von Hippel, E. and Katz, R. (2002) Shifting innovation to users via toolkits. ‘Management Science.’ 48, pp.821–833.

79. Thomke, S. and von Hippel, E. (2002) Customers as innovators: a new way to create value. ‘Harvard Business Review.’ 80 (4), pp.74–81.

80. Flowers, S. (2008b) op.cit. p.15.

81. Flowers, S. (2008a) op.cit. p.15.

82. See www.redbullflugelbinder.com

83. Kirshner, B. (2007) Introduction: Youth Activism as a Context for Learning and Development. ‘American Behavioral Scientist.’ 51(3) pp.367-379.

84. Prout, A. (n.d.) *Childhood – 2025 and Beyond, Beyond Current Horizons*, Challenge Paper. Available at: www.beyondcurrenthorizons.org.uk/wp-content/uploads/bch_challenge_paper_childhood_alan_prout.pdf [Accessed on 4 December 2008].
85. Wilkinson H. and Mulgan, G. (1995) 'Freedom's children: work, relationships and politics for 18-34 yr olds in Britain today.' London: Demos.
86. Cohn, J. (1992) 'A Lost Political Generation?' *The American Prospect*, 9, pp.30-38.
87. OECD (2001) 'What Schools for the Future?' Paris: OECD.
88. Flanagan, C. (2008) *Young People's Civic Engagement and Political development*. London: Routledge.
89. Kirshner, B. (2007) *op.cit.* p.20.
90. Leadbeater, C. and Goss, S. (1998) *Civic Entrepreneurship*. London: Demos/Public Management Foundation. p.16.
91. UNICEF (2007) *op.cit.* p.6.
92. Madoerin, K. (2008) 'Mobilising Children and Youth into their own – and Youth-led Organisations.' Johannesburg: REPSSI. p.3.
93. Cornwall, A. and Coelho, V. (2004) 'New Democratic Spaces?' *IDS Bulletin*, 35 (2).
94. Cornwall, A. and Coelho, V. (2006) 'Spaces for change? The Politics of Participation in New Democratic Arenas.' London: Zed. p.1.
95. Bell, B.L. (2005) 'Children, Youth and Civic (dis)Engagement: Digital Technology and Citizenship.' Toronto: CRACIN.
96. Weller, S. (2003) "Teach us something useful": contested spaces of teenagers' citizenship. *Space and Polity*, 7, (2), pp.153-171. Cited in Bell *op.cit.* p.15.

that the former will lead to the latter, but it is important first to distinguish between the two types of engagement and activism.

Understandably, given the pervasive recent concern among adults in the West about the disengagement of young people from democratic participation^{84,85,86} and from formal education,⁸⁷ the developmental paradigm dominates the academic literature.⁸⁸ Typologies of participation are usually enclosed within a socialisation discourse of transition to adulthood through 'youth development' or 'empowerment'. Kirshner, in reviewing the literature on youth activism, takes this developmental view of it being about transitions in adolescence and suggests that "activism groups connect youth to mainstream civic institutions".⁸⁹ He proposes four distinctive qualities of learning environments that characterise youth activism groups: collective problem solving, youth-adult interaction, exploration of alternative frames for identity, and bridges to academic and civic institutions. The emphasis in Kirshner's paper is on activism as an innovative form of learning to support the transition to adulthood, but it could be regarded as an innovative form of social action that may lead to social changes.

The capacity for youth innovation that is derived from the cultivation of a greater civic sensibility and responsibility in young people varies. In some accounts, the 'civic' is defined broadly to include public sector services and their reform, as in the 'civic entrepreneurship' celebrated by Leadbeater and Goss. This approach extends the more familiar idea of 'social entrepreneurship' and sees experimentation and innovation in public organisations in the UK as being "as much about political renewal as it is about managerial change".⁹⁰ In this case, renewal and change can be stimulated by enabling young people to participate actively in risk-taking and innovation.

The connection between social entrepreneurship and what is also sometimes called 'civil engagement' has been particularly influential in the field of international development.⁹¹ Here the need to re-position children as active citizens who initiate and lead change is increasingly pressing in the face of the social catastrophe caused in some countries by poverty, war and HIV/AIDS. In this case, the recognition of the need for innovative ways of providing psycho-social support when family and school cannot be relied upon is linked to the right of children under the United Nations Convention on the Rights of the Child (UNCRC) to form and join associations. Madoerin champions the idea of 'child-led associations' that are said to foster the development of well-being and life skills through self-organisation, advocacy and collective action. These are protective mechanisms in severely challenging social and economic circumstances but they are also explicitly civic in their focus, being intended to "foster democratic principles and democratic skills" as well.⁹²

Others working within this field draw less on the idea of entrepreneurship and more on a commitment to the development of 'new democratic spaces'.⁹³ These are situated at the 'interface between the state and society' and either provided by the state or 'conquered by civil society demands for inclusion'.⁹⁴ New democratic spaces are unequivocally 'spaces' for political participation. At this end of the 'civic' spectrum, political activism and mobilisation are of explicit interest. They can take place within programmes of 'youth development', in independent organisations and social movements, or in the intermediary spaces discussed by Cornwall and Coelho.

However, Bell noted that some young people use 'spaces' available to them to engage as citizens, for example skate parks or volunteering rather than voting.⁹⁵ In this example, young people are seen as active citizens as they participate as political actors in the reconstruction of spaces such as skate parks. Weller looks at citizenship through children's voices and experiences.⁹⁶ She states that "spaces such as skate parks illustrate the often hidden geographies of citizenship, not just in terms of practical participation but on a much deeper level of identity and belonging". This suggests different citizenship practices by young people than those of adults, which tend to be in more traditional spaces and opportunities. This implies the need for a widening conceptualisation of civic engagement.

The question for us here is the extent to which these civic and political activities might be said to be both youth-led and innovative. A number of examples can be found of youth-led mobilisation and activism. Direct youth influence on decisions is enabled through the government-based initiatives in Canada⁹⁷ which provide opportunities for young people to “act in direct relationship with the government and provide input on policy and programme development”.⁹⁸ Bell cited the Canadian Aboriginal Youth Network,⁹⁹ a government funded website, run by youth for youth and where young people make the decisions. This resonates with Matthews’ suggestion that structures should be created in response to demand from young people themselves.¹⁰⁰

Prominent in the UK have been the recent campaigns respectively by the British Youth Council (BYC), campaigning with others for the right to vote at 16¹⁰¹ and by the Children’s Rights Alliance for England (CRAE), for the full acceptance by the UK government of the UNCRC.¹⁰² While the intended outcomes of these campaigns may be regarded as innovative, the campaigning methods used in each case are not especially innovative, involving lobbying, petitioning and marching. Similarly in the US, where there has been a far greater level of independent political activism around school reform and community mobilisation, the methods have certainly been youth-led but they have also been fairly traditional.

More interesting here is the political work of the National Union of Students, one of the best examples of an established youth-led activist group in the UK. The NUS is explicit in this respect, having the vision of itself as “a pioneering, innovative and powerful campaigning organisation”.¹⁰³ It was reported by participants at the focus groups to be regularly consulted by politicians. It ran an award-winning campaign in September 2007 that forced the HSBC bank to reverse its decision to impose charges on graduate overdrafts. What made this campaign innovative was the use of digital media, specifically *Facebook*, the social networking site, to generate the student interest and press coverage that forced the hand of HSBC.

Others have noted the potential powerful role of technology in youth activism. Bell, in his review of youth civic engagement, notes that young people may be developing ‘new forms of social activism’¹⁰⁴ and ‘new types of politics’.¹⁰⁵ Montgomery *et al.*¹⁰⁶ illustrate this when they describe:

... a low-profile civic upsurge created for, and sometimes by, young people which has been taking root on the internet. Hundreds of websites have been created to encourage and facilitate youth civic engagement.

There is an emergent academic literature on the use of social networking sites to facilitate youth participation, civic engagement and political activism. This is mostly addressed from a ‘youth development’ perspective.^{107,108,109,110} This approach has been adopted in the UK by the Local Government Information Unit (LGIU) Children’s Services Network, which has started to organise seminars to promulgate the opportunities of new media to local councils and other agencies. However, it is also possible to find accounts that consider social networking as a grass-roots method of mobilisation as well as a facilitated mode of civic socialisation.¹¹¹

The most striking contemporary example of innovative, youth-led politically activist social networking is the My.BarackObama campaign. Chris Hughes, the designer of *Facebook* and still only 24 years of age at the time, took a decisive leadership role in this interactive, online campaign from 2007. Text messaging, web pages and online action groups were employed to mobilise grass-roots support, to “fight the underground, email whisper campaigns and robo-calls that surfaced in battleground states”¹¹² and to get the vote out on the day.

The result was the huge increase in the youth vote that in large part produced the Obama victory. It has contributed powerfully to the sense that earlier concerns about the political

97. These include SchoolsNet Youth Advisory Board at www.schoolnet.ca/syabccjr/e/home.asp and the National Rural Youth Network – www.ruralyouth.ca.
98. Bell, B.L. (2005) op.cit. p.15.
99. www.ayn.ca
100. Matthews, H. (2001) op.cit. p.16
101. www.votesat16.org.uk
102. www.getreadyforchange.org.uk
103. NUS (2008) ‘Strategic Plan 2009-10’ London: NUS.
104. Bell, B.L. (2005) op.cit. p.18
105. Megyery, K. (1991) Preface in Megyery, K. (ed.) ‘Youth in Canadian Politics: Participation and Involvement.’ Toronto: Dundurn Press and Minister of Supply and Services.
106. Montgomery, K., Gottlieb-Rhodes, B. and Larson, G.O. (2004) ‘Youth as e-citizens: Engaging the digital generation.’ Washington, DC: Centre for Social Media, School of Communication. p.2.
107. Davies, T. and Cranston, P. (2008) ‘Youth Work and Social Networking.’ Leicester: The National Youth Agency.
108. Loader, B. (ed.) (2007) ‘Young Citizens in the Digital Age.’ Abingdon: Routledge.
109. Raynes, G.K. and Walker, L. (2008) Our Space: Online Civic Engagement Tools for Youth. In Bennet, L. ‘Civic Life Online: Learning how digital media can engage Youth.’ Cambridge MA: The MIT Press.
110. Valenzuela, S., Park N. and Kee, K. (2008) ‘Lessons from Facebook: the effects of Social Network Sites on College Students’ Social Capital.’ In 9th International Symposium on Online journalism. Austin: Texas.
111. Hara, N. (2008) Internet use for political mobilization: Voices of participants. ‘First Monday’ 13, 7. Available at: <http://firstmonday.org>
112. Wired Blog Network (2008) ‘Propelled by Internet, Barack Obama Wins Presidency.’ Available at: <http://www.blog.wired.com/27bstroke6/2008/11/propelled-by-in.html> [Accessed on 13 February 2009].

113. Winograd, M. and Hais, M. (2008) 'Millennial Makeover, MySpace, YouTube, and the future of American Politics.' New Brunswick: Rutgers University Press.
114. Camino, L. A. (2000) Youth-Adult Partnerships: Entering New Territory in Community Work and Research. 'Applied Developmental Science.' 4(supp 1) pp.11-20.
115. e.g. Zeldin, S., Petrokubi, J. and MacNeil, C. (2008) Youth-adult partnerships in decision-making: Disseminating and implementing an innovative idea into established organisations and communities. 'American Journal of Community Psychology.' 41, pp.262-277.
116. Whitty, G. and Wisby, E. (2007) op.cit. p.13.
117. Matthews, H. (2001) op.cit. p.15.
118. Barber, T. (2007) Young people and civic participation: A conceptual review. 'Youth and Policy.' 96, pp.19-39.
119. Brake, M. (1980) 'The Sociology of Youth Culture and Youth Subcultures.' London: Routledge and Kegan Paul. p.8; p.23.
120. Lévi-Strauss (1962) The Savage Mind used the word 'bricolage' to describe any spontaneous action which makes creative and resourceful use of whatever materials are available regardless of their original purpose.
121. Hebdige, D. (1979) 'Sub-Cultures – the Meaning of Style.' London: Methuen.
122. Brake, M. (1980) op.cit. p.12.

disengagement of what in the US is known as the Millennial Generation (born 1982-2003) can now be set aside.¹¹³ It seems likely that social networking will continue to be employed innovatively by young people, both independently for purposes of direct political action (as happened in the case of the spontaneous campaigns that broke out in the aftermath of youth shootings in London in 2008), and as part of existing organisational strategies for participation and civic engagement in schools and youth groups.

Some of these examples, such as school councils, remain predominantly about adults creating opportunities for engagement, rather than youth innovation to encourage youth civic engagement. For example, in Camino's study of youth-adult partnerships, young people were sometimes active participants, but they were participating in opportunities created by adults.¹¹⁴ The extensive research by Zeldin and colleagues, on youth-adult partnerships in decision-making notes the benefits of youth and adult collaboration in implementation of innovation, but much remains adult-led.¹¹⁵ Innovation is possible, but not probable in these examples. Whitty and Wisby reported that 95 per cent of schools have school councils but most tackle issues relating to their school's environment and facilities rather than teaching and learning.¹¹⁶ While only a few school councils currently do so, 45 per cent of teachers surveyed in the study reported that they would like pupils involved in staff appointments and 30 per cent suggested that it was appropriate for them to have representation on schools' governing bodies. The authors concluded that training and support for pupils is crucial if school councils are to genuinely build and develop pupil capability to lead and innovate.

Adult-created structures such as school councils are often regarded as only reaching the most articulate young people. Matthews, in a review of the literature on participatory structures, concluded that youth fora are a good way of encouraging participation but that they are an inappropriate way of engaging many young people, especially those who are traditionally hardest to reach.¹¹⁷ In aiming to include young people, some agencies establish structures and bureaucracies that only involve a 'select' few, sidelining others, whose voices in decision-making are lessened as a result. Hence, in drawing conclusions about the impact of youth-led innovation, inclusivity needs to be considered.

Some, usually adult-initiated innovations, are intended to improve conformity for example, by encouraging more youth into the labour market, attempting to improve school attendance or initiate schemes to reduce crime. Barber notes that attempts to engage young people politically are sometimes aimed at achieving greater conformity.¹¹⁸

Domain 3: Cultural, subcultural or countercultural innovation

Like youth activism, innovation that can be characterised as subcultural or countercultural is, at least initially, a form of rebellion or exploration of difference and an apparent rejection of the mainstream. In a useful review, Brake defines subcultures as "meaning systems, modes of expression or life styles developed by groups in subordinate structural positions in response to dominant meaning systems".¹¹⁹ Based on studies from the 1970s and early 1980s, Brake identifies three main subcultural groups who develop innovative practices: 'delinquent youth', mainly adolescent working class males, who range from disaffected or rebellious young people to young offenders; 'cultural rebels', who tend to be middle class bohemians, engaged in art and music; and 'politically militant youth' who are involved in radical politics. Brake argues that the common factor between these categories is young people striving to find new identities and forms of expression, creating distinctive and innovative life styles, values and ideologies, summarised in the terms 'bricolage'¹²⁰ and 'style'.¹²¹ As the symbolic representation of a subcultural group, innovative style encompasses 'image', including dress and hairstyle, 'demeanour' or posture and expression, and 'argot', the special language of the group.¹²²

Many ethnographic studies of subcultural groups carried out in the UK in the 1970s document such groups and their particular innovative practices: for example, Cohen's study of mods and rockers,¹²³ Willis on hippies,¹²⁴ and Hebdige on Rastafarianism and punk¹²⁵ (see also Hall and Jefferson).¹²⁶ Punk is a particularly good example of how a subcultural group developed and adopted an anti-commercialist life style¹²⁷ with a unique style of dress (bondage, safety pins), hair (shaved heads with multi-coloured spikes) and music (exemplified by the Sex Pistols), designed to shock and criticise establishment culture. Ironically, this highly innovative subcultural style was adopted by designers such as Vivienne Westwood and music producers such as Malcolm McLaren who helped make it part of mainstream culture and commercially lucrative. Hebdige argues that this is a predictable and unavoidable process: "Youth cultural styles may begin by issuing symbolic challenges, but they must inevitably end by establishing new sets of conventions".¹²⁸

However, the earlier 1960s countercultural hippie movement in the USA, with its anti-consumerist lifestyle and use of hallucinogenic drugs charted in the classic text by Roszak, has arguably had a profound, long lasting impact, in some surprising ways.¹²⁹ Brake makes the case that alternative life styles, such as New Age travellers, and radical political movements such as feminism and gay rights, can all be seen to have roots in the hippie counterculture.¹³⁰ Markoff argues that personal computing developments from California grew out of one arm of the 1960s countercultural movements. Use of psychedelic drugs, mainly LSD, by pioneering engineers in Silicon Valley, was the inspiration for many computing discoveries. Computing was also a way of avoiding the Vietnam draft. Markoff gives a useful analysis of the sources of innovation and argues that the impact on subsequent technological development was significant.¹³¹

A gendered dimension of subcultural innovation is largely absent in most 1970s subcultural studies. McRobbie and Garber challenge the invisibility of young women in subcultures and stress the different ways in which girls define their identity in creative ways.¹³² Frith argues that music is one arena in which women have sometimes been able to challenge traditional culture and develop innovative, at times disturbing styles, particularly in punk music – Siouxsie and the Banshees are a good example.¹³³ Women playing a fuller part in innovative subcultural practices can be seen in Cunningham's insider study of the innovative use of technology in underground clubs and dance culture.¹³⁴

More recently, Hodkinson's insider study of goth identity and subculture in the 1990s includes a comprehensive critique of both traditional and postmodernist subcultural theory.¹³⁵ Criticising postmodernists such as Muggleton¹³⁶ who claim that mass media and commercialisation have led to fragmentation and loss of youth innovation, Hodkinson argues that creativity and individuality can still be found in subcultural groups such as goths. He puts forward four criteria for more recent subcultural groups: identity, distinctiveness, autonomy and commitment.¹³⁷ Unlike the resistance and opposition to commercialisation found in earlier subcultures,¹³⁸ both Hodkinson and Thornton argue that the media and commercial enterprise are often integrally involved in modern subcultural innovation,¹³⁹ although Hodkinson makes a clear distinction between commercially motivated, mass media and the 'internal DIY network'¹⁴⁰ of small, alternative record labels, underground DJs and home-made fanzines. McRobbie¹⁴¹ and Cunningham¹⁴² also stress the role of small scale entrepreneurialism in developing and sustaining innovative underground dance and club cultures, sometimes verging on illegal practices.

Taking this further, Flowers¹⁴³ describes 'outlaw users', defined as individuals or groups who actively oppose or ignore technical standards, existing products, systems or legal frameworks to share digital content such as music, develop software or exploit security loopholes in IT systems. He suggests that 'outlaw innovation' has impacted on the nature and direction of mainstream efforts to innovate. It operates informally, and is often motivated by curiosity and challenge, rather than by commercial interest. As with many forms of rebellious activity, attempting to stimulate it, thus giving it a level of acceptance, may de-motivate those involved.

123. Cohen, S. (1972) 'Moral Panics and Folk Devils.' London: MacGibbon and Kee.
124. Willis, P. (1978) 'Profane Culture.' London: Routledge and Kegan Paul.
125. Hebdige, D. (1979) op.cit. p.23.
126. Hall, S. and Jefferson, T. (1976) 'Resistance Through Rituals: Youth subcultures in post-war Britain.' London: Hutchinson.
127. Brake, M. (1980) op.cit. p.23.
128. Hebdige, D. (1979) op.cit. p.96.
129. Roszak, T. (1968) 'The Making of a Counterculture: Reflections on the technocratic society and its youthful opposition.' New York: Doubleday and Co. Inc.
130. Brake, M. (1980) op.cit. p.23.
131. Markoff, J. (2005) 'What the doormouse said: How the 60's counterculture shaped the personal computer industry.' London: Penguin.
132. McRobbie, A. and Garber, J. (1976) Girls and Subcultures. In, Hall, S. and Jefferson, T. (eds.) (1976) op.cit. See also McRobbie on girls and punk: McRobbie, A. (1980) Settling accounts with subcultures: a feminist critique. In McRobbie, A. (2000) 'Feminism and Youth Culture.' 2nd edition. London: Macmillan. pp.26-43.
133. Frith, S. (1978) 'The Sociology of Rock.' London: Constable.
134. Cunningham, H. (1998) 'Digital cultures: the view from the dance floor.' London: UCL Press.
135. Hodkinson, P. (2002) 'Goth, identity, style and subculture.' Oxford: Berg.
136. Muggleton, D. (2000) 'Inside Subculture: The Post Modern Meaning of Life.' Oxford: Berg.
137. Hodkinson, P. (2002) op.cit p.29.
138. Hebdige, D. (1979) op.cit. p.23.
139. Thornton, S. (1995) 'Club Cultures: Music, Media and Subcultural Capital.' Cambridge: Polity.
140. Hodkinson, P. (2002) op.cit. p.7.
141. McRobbie, A. (1994) 'Postmodernism and Popular Culture.' London: Routledge.
142. Cunningham, H. (1998) op.cit. p.24.
143. Flowers, S. (2008b) op.cit. p.15.

144. McRobbie, A. (1980) *op.cit.* p.24.
145. Willis, P. (1990) 'Common Culture: symbolic work at play in the everyday cultures of the young.' Milton Keynes: Open University Press.
146. McRobbie, A. (1994) *op.cit.* p.24.
147. Abbott, C. (1998) Making connections: young people and the internet. In Sefton-Green, J. (1998) 'Digital Diversions: Youth Culture in the Age of Multimedia.' London: UCL Press. pp.84-105.
148. An emoticon is a symbol(s) used for emotional communication in writing or messages.
149. Greenfield, P. M. and Subrahmanyam, K. (2003) Online discourse in a teen chatroom: New codes and new modes of coherence in a visual medium. *Journal of Applied Developmental Psychology*. 24 (6), pp.713-738.
150. McKay, S., Thurlow, C. and Zimmerman, H. (2005) Wired whizzes or techno-slaves? Young people and their emergent communication technologies. In Williams, A. and Thurlow, C. (eds.) 'Talking adolescence: Perspectives on communication in the teenage years.' New York: Peter Lang. p.192.
151. Merchant, G. (2001) Teenagers in cyberspace: an investigation of language use and language change in internet chatrooms. *Journal of Research in Reading*. 24 (3), pp.293-306.
152. Merchant, G. (2005a) Digikids: cool dudes and the new writing. 'E-Learning.' 2 (1), pp.50-60.
153. Merchant, G. (2005b) Electric Involvement: Identity performance in children's informal digital writing. 'Discourse.' 26 (3), pp.301-314.
154. Merchant, G., Dickinson, P., Burnett, C. and Myers, J. (2006) Do you like dogs or writing? Identity performance in children's digital message exchange. 'English in Education.' 40 (3), pp.21-38.
155. Thurlow, C. (2003). Generation Txt? The sociolinguistics of young people's text-messaging. 'Discourse Analysis Online' (online) Available at: <http://www.shu.ac.uk/daol/> [Accessed on 13 February 2009]. p.196.
156. Jeppesen, L. B. and Molin, M. (2003) *op.cit.* pp.18.
157. Marsh, K. (1995) Children's singing games: composition in the playground? 'Research Studies in Music Education.' (4) pp.2-11.
158. Sefton-Green, J. and Buckingham, D. (1998) Digital visions: children's 'creative' uses of multimedia technologies. In Sefton-Green, J. (1998) *op.cit.* pp.62-83.

There are a number of examples through which innovation has been used to explore identity in youth (see, in particular, McRobbie¹⁴⁴ and Willis¹⁴⁵). As literature on diffusion theory suggests, the small numbers of innovators rely on early adopters to encourage trends and movements. Yet, examples given here describe how, when safe spaces for innovation are created, changes or innovations can occur on a regular basis by young people exploring parts of their identities. McRobbie¹⁴⁶ stresses young women's creative and innovative use of mass media and commercial products, which can take place in the home as well as in public.

One area from which innovation emerges from exploration of youth identity is eCommunication. The innovative processes in e-technology communication have changed some of the ways in which innovation develops, focusing on interaction rather than products or services. They may combine language and visuals, mixing decoration, aliases and abbreviations. Abbott¹⁴⁷ studied the development of young people's personal homepages, early chat rooms and online communities and noted innovative combinations of text, graphics, sound and video. Early chatrooms included innovative use of language, emoticons¹⁴⁸ and acronyms. Similarly, Greenfield and Subrahmanyam¹⁴⁹ found that young people had altered the written text register in an online chatroom to adapt the visual aspects of computer-mediated communication by using numbers, colour and different text style. By adapting the language, the young people were able to "keep conversational coherence ... and maintain an ongoing text stream".¹⁵⁰

Merchant¹⁵¹ similarly found that teenage girls expanded forms of communication through chat rooms using 'netiquette', images, emoticons, abbreviations, phonetic spellings and aliases. In a later study, Merchant¹⁵² noted similarly that 9-10 year olds paired with writing partners experimented with new linguistic and visual forms leading to new ways of communicating. In a further study focusing on email exchanges, Merchant found that beyond linguistic innovation, 8-10 year olds developed greater autonomy, drawing on their social and cultural identities in gender, class and ethnic-specific ways through use of email and visual icons, for example by 'authoring' themselves.^{153,154} He suggested that these young people are innovating by extending new forms of communication that challenge existing language, develop peer relationships and give them a better sense of identity, as well as acquiring new marketable skills.

Thus, young people are co-producers of the web through online magazines or blogs, often with diary-like entries, for their peers and others. Thurlow notes that some adults fear that these uses of communication technology mean young people are "completely reinventing, and thereby destroying, standard (English) language use".¹⁵⁵ There is an extensive literature on how texting and internet use have impacted both positively and negatively on language, which is outside the scope of this review. However, these developments are involving young people in an interactive innovative process that develops their group and personal identities. A similar process occurs in computer gaming.¹⁵⁶ Younger children, mainly girls, were found to be innovative in the development of singing games in school playgrounds in Australia.¹⁵⁷ Like many of the examples above, these innovations tended to be part of a collaborative process between young people, not bound by formal instruction or adult intervention. The innovations become widely adopted and embedded in everyday youth culture. In this sense, models of 'subcultural theory' cannot explain them.

Sefton-Green and Buckingham explored the creative use of technology for innovation.¹⁵⁸ A fifth of the secondary school pupils they interviewed were high users of IT and were involved in graphics, animation, video and music innovations. However, they viewed their own engagement as addressing boredom rather than as intentional innovation. Youth-led innovation in the cultural, subcultural and countercultural domain illustrates the role that can be played by exploring youth identity and difference as drivers for developments, many of which were not originally intended to be innovative.

4. We identified some powerful facilitators of youth-led innovation

If we are to develop strategies to promote and support youth-led innovation, we must first identify what are most likely to help and hinder such activities. The literature is helpful in this regard. Indeed, some of the facilitators and barriers it identified were strongly confirmed in the focus group discussions. However, a factor which is helpful for a young person at one stage, such as support provided by a parent, teacher or youth worker, can turn into a barrier in the development of the young person's ideas if, for example, an adult interferes too much or maintains too much control. Hence, the focus group participants recommended a flexible approach. Each of the structures or media developed to facilitate youth-led innovation will have different reaches, adoption, implementation and adaptation.

Social capital gained through social networking is an important facilitator

Social networks work in different ways to assist youth innovation.^{159,160,161,162} Firstly, social interaction may facilitate the development of the innovation; secondly, social networks might provide information about how to take innovations forward; and thirdly, social networks can help get the innovation out to a wider audience. Groups of young people, often 'lead-users', use social interactions to gather ideas, experiment and to test ideas out on each other. Often it is the young people feeding off each other who facilitate the innovation.

Establishing social networks and the ability to use these networks to gain advice and support and to try out and disseminate ideas seem to be crucial facilitators. Social networks also provide access to information and knowledge which young innovators identified as helpful in supporting their developments.¹⁶³ Opportunities for networking with others who have innovated or overcome barriers are seen as particularly helpful. For example, *Triangle*¹⁶⁴ provides advocacy and support for young people with disabilities, engaging people with disabilities, as consultants in this process and linking individuals and groups who can then support one another. Karlin,¹⁶⁵ herself a youth innovator, established an online space where young innovators can come together to support each other, get advice and swap ideas.¹⁶⁶ Part of this social function involves linking inventors to potential sponsors, thus aiding the move from invention to innovation.

Turner¹⁶⁷ describes the development of *The Whole Earth Catalog*, which offered an alternative vision of technology as a tool for individual and collective transformation. It facilitated individuals educating themselves, finding inspiration and shaping their environment. It re-imagined computers as tools for personal liberation, building virtual and alternative communities, and crossing social frontiers. Above all else, it created social networks through journalists and publicists promoting the necessary excitement. Barley¹⁶⁸ commented that:

159. Camino, L.A. (2000) op.cit. p.23.
160. Karlin, S. (2004) Young inventors of the world unite (Innovators International Network). 'Spectrum IEEE' 41 (3), pp.53-55.
161. Turner, F. (2006) 'From Counterculture to Cyberculture.' Chicago: University of Chicago Press.
162. YACSI (Youth Action Council on Sustainable Innovation) (2002) 'Making Innovation Sustainable Among Youth in Canada.' Ottawa: Canada's Innovation Strategy and Practice of Innovation. <http://innovation.gc.ca/gol/innovation/site.nsf/en/in02407.html>
163. Ibid.
164. Triangle <http://www.triangle-services.co.uk/>
165. Karlin, S. (2004) op.cit. p.26.
166. See www.younginventorsinternational.com
167. Turner, F. (2006) op.cit. p.26.
168. Barley, S. (2007) From Counterculture to Cyberculture In Brand, S. and Turner, F. (2007) *The Whole Earth Network and the Rise of Digital Utopianism*. 'Administrative Science Quarterly' (3), p.486.

169. Jeppesen, L.B. and Molin, M. (2003) op.cit. p.18.
170. YACSI (2002) op.cit. p.26.
171. Rolfe, H. and Crowley, T. (2008) op.cit. p.18.
172. See www.yse.org.uk
173. See www.whatifinnovation.com
174. See www.unltd.org.uk
175. Camino, L.A. (2000) op.cit p.23.
176. Op. cit. p.17.

Turner shows how the ideology of an important segment of the counterculture drew heavily on the ideas of information theory, cybernetics, and general systems theory to justify rejecting bureaucracy and hierarchical authority while retaining faith in technology and horizontally organised networks of experts.

Social links are increasingly facilitated in online spaces. For example, in gaming communities, social spaces are set up by companies exploiting the innovative tendencies of users. The joy of innovating and recognition from peers are also motivating factors for user-innovators.¹⁶⁹ Policymakers might think of ways to facilitate these social networks and identify how these spaces can be made available where access to the internet and new technologies might be weaker, for example in poorer households.

Role models provide major sources of support

Role models emerge from the literature¹⁷⁰ and the focus groups as key factors in facilitating youth-led innovation. Rolfe and Crowley¹⁷¹ note that parents were a major source of information and can act as role models for work placements, but that this could be much further developed. The Commission for Youth Social Enterprise (CYSE)¹⁷² was created by 21 of Britain's top young social entrepreneurs and launched with support from the Cabinet Office, the 'WHAT IF!' innovation company¹⁷³ and UnLtd – The Foundation for Social Entrepreneurs.¹⁷⁴ The Commission provides support to help 18-28 year olds to get their business plans off the ground. The Commission aims to work with third sector bodies to remove obstacles impeding aspiring social entrepreneurs; its young entrepreneurs have already launched successful businesses in areas including IT and the arts and they act as role models for other young people.

Support and trust of others is crucial

Adult support for the innovator or innovating group, particularly from parents and teachers, is often critical for an innovation to develop and be adopted. This support needs to demonstrate trust in the innovator, with a willingness to take risks, and is more effective if it includes constructive feedback. Camino¹⁷⁵ noted how a young person described his idea for building community bus shelters as a means to improve conditions for residents. Initially, at several meetings, adults ignored him. It took the public backing of a youth development specialist group for his idea to gain ground. Our focus groups saw the positive experience of successful innovation as a major facilitator, while conversely negative effects occurred from bad experiences. Many of the organisations that attended the focus groups provide support through mentoring services, including one-to-one discussions about aims, planning, contacts and outcomes, to young people engaged in innovative activities.

Support within organisations sometimes comes from a 'champion'. This may be a manufacturer of computer games providing chat rooms and toolkits. More likely, it will come from online or face-to-face peer groups.¹⁷⁶ Some firms now facilitate environments for young users to interact and support each other, though many other communities emerge spontaneously. Canada's Youth Action Council on Sustainable Innovation (YACSI) report¹⁷⁷ noted the importance of this in sustaining longer-term innovation. YACSI also noted the importance of financial and other support.

Flexible space, time and opportunities enable youth-led innovation to develop

Spaces for innovation mean not only physical spaces, but also the time and opportunity to innovate. Physical space might be adult-initiated or instigated or encouraged by young people themselves. Such space may be tangible, as in a youth centre, or virtual, as with gaming communities.¹⁷⁸ What seems important to innovation in these spaces is that they are enabling environments and that any adults present do not seek to control or inhibit the ideas and actions of young people. Some spaces, like school councils, often by their very nature, do not encourage innovation¹⁷⁹ because of the required conformity to adult social norms.

Innovation is often encouraged through flexible approaches by facilitators guiding the space. For example, the YACSI report noted that unconventional teachers, greater use of imagination in early grades, programmes targeting pupils identified as gifted, workshops allowing different means of learning, interactive classes, learning without teachers, children as teachers, open-ended assignments and problem-based learning, were all examples of flexibility in schools which seemed to support youth-led innovation.¹⁸⁰ In our previous research, we observed that some of these practices, and their impact upon personalised learning and student leadership, were more frequent in primary than in secondary schools, owing to the constraints imposed by the secondary school curriculum, assessment and timetabling.¹⁸¹

The literature points to innovation often being a lengthy process, so giving young people the time to process the innovation is important.¹⁸² Shah's study of skateboarding, snowboarding and windsurfing innovators found that those users who were there in the initial stages of the sport's development were the most innovative.¹⁸³ As the sport became more popular, many of the necessary innovations had been made.

177. YACSI (2002) op.cit. p.26.

178. Jeppesen, L.B. and Molin, M. (2003) op.cit. p.18.

179. Although it could possibly be a by-product.

180. YACSI (2002) op.cit. p.26.

181. Sebba, J. et al. (2007) op.cit. p.19.

182. YACSI (2002) op.cit. p.26.

183. Shah, S. (2000) op.cit. p.17.

5. There are some strong barriers to youth-led innovation

184. YASCI (2002) op.cit. p.26.

185. Barber, T. (2007) op.cit. p.23.

186. Camino, L.A. (2000) op.cit. p.23.

187. Druin, A. and Fast, C. (2002) op.cit. p.19

188. von Hippel, E. (1988) 'The Sources of Innovation.' Oxford: Oxford University Press.

Negative attitudes towards young people can limit their confidence

A number of barriers emerge from the literature. The concept of 'youth' is often referred to negatively in the media, the community and sometimes in schools.¹⁸⁴ In addition, the use of language can exacerbate this negativity – the term 'kids', for example, is not seen by young people themselves as conveying respect. Barber commented:

*The so-called youth problem is in many cases an adult problem; a failure of adults to understand the world in which young people function. A nation's youth are usually at the vanguard of social change and the shifting trends in society; this makes them particularly susceptible to criticism.*¹⁸⁵

Camino noted how adults can overcome negative attitudes to young people if they work with them on community concerns.¹⁸⁶ This suggests that attitudes need to form a critical element in a framework of youth-led innovation. Moreover, future strategies and programmes to promote youth-led innovation will need a strong communication plan that celebrates its social, economic and cultural benefits to the whole community.

Power relationships with adults can inhibit young people from taking the lead

Many of the studies we identified focus on initiatives that are initially adult-led and that sometimes maintain adult control even when espousing youth leadership. Genuinely youth-led initiatives are less likely to be formally evaluated or identified in literature reviews. However, the literature suggests that the 'letting go' or 'handing over' of resources and decision-making requires sensitive handling of the power relationships. Moreover, young people's perceptions of authority may also need to be challenged. Druin and Fast noted that children's perceptions of the teacher or parent as an authority figure can be a barrier to 'co-creation' and 'co-design' as they wait for the adult to set the parameters rather than initiating ideas themselves.¹⁸⁷

Familiarity can impede innovation

The theoretical perspective of von Hippel on sources of innovation, argues that familiarity with existing product attributes and uses interferes with an individual's ability to conceive of novel possibilities.¹⁸⁸ Thus, their real world experiences constrain their capacity to innovate. Rappa and Debackere's review of the literature on the links between age and innovation in scientific research suggests that, once an important innovation is made and a new field is opened up to investigation, younger scientists are more likely to be drawn into it than older

ones.¹⁸⁹ In support of von Hippel, they argue that the resistance reported in older, more established scientists relates to their familiarity with the arguments in their field of focus.¹⁹⁰

For young people, initiatives that expose them to the new and unfamiliar may stimulate innovation. This is supported by the finding in the YACSI report, that new experiences, such as new endeavours, meeting new people or travelling to new places could all facilitate youth-led innovation as they provide the stimulus of the unknown.¹⁹¹ For younger children, for whom many experiences of everyday life are encounters with the unknown, Druin and Fast¹⁹² suggest that stimulating them to innovate works best by starting with something close to their 'zone of proximal development'.¹⁹³ In their research^{194,195} they got children to 'invent new sandwiches' before moving on to less familiar territory. This might suggest the need for a developmental aspect to the framework for youth-led innovation, but individual differences in development and the fact that young children can develop innovative ideas, would preclude rigidly linking age to innovative capability.

Structures aimed at increasing innovation may act as barriers

Some writers have noted that the structures set up to promote participation and innovation, such as school councils and the Youth Parliament, are sometimes ineffective and 'perpetuate the disenfranchisement of youth'.¹⁹⁶ Councils designed for young people often replicate adult councils, suggesting adult behaviour that does not accept young people as they are, but wants them to mimic adults which Barber refers to as 'adultising'.¹⁹⁷ Concerns include their exclusivity, accountability, tokenism, partiality and sustainability. Matthews notes that the young people involved often do not represent the diversity of people in the community and can thus disempower others.¹⁹⁸ Matthews and Limb note that young people are not politically apathetic, but sceptical of 'tokenism and rhetoric' that come with these new forms of 'participation'.¹⁹⁹ They comment:

*New evidence suggests ...that many youth forums are flawed and inappropriate participatory devices, often obfuscating the voices of those whom they are meant to empower.*²⁰⁰

The YACSI report identified a broad range of factors that influence youth-led innovation, including those falling outside the formal education curriculum.²⁰¹ The majority of respondents in the YACSI survey characterised the educational system as a suppressor of innovation.²⁰² They suggested that teachers are sometimes too helpful, stifling students' ability to think for themselves. New ideas are often ridiculed or ignored and many creative thinkers are persuaded by the educational system to maintain the status quo. Most of the respondents, who themselves were successful innovators, displayed a weak attachment to the educational system.

There can be legal and financial constraints and lack of support

Structural barriers such as legal age restrictions on banking, setting up companies and applying for patents, act as barriers for youth-led innovation. Peel gives an account of the debate about a provision in the Companies Act 2006 that prevents people under 16 from becoming company directors.²⁰³ The legislation was justified at the time by the need to stop fraud where parents made their children directors of companies in order to protect themselves from legal action. In January 2006, according to official figures reported by Peel, there were 432 directors under 16, less than half of whom were under 10. Peel suggests that this legislation could be seen as a barrier to the government's much-publicised commitment to school-age entrepreneurship.

189. Rappa, M. and Debackere, K. (1993) Youth and scientific innovation: the role of young scientists in the development of a new field. 'Minerva.' 31 (1), pp.1-20.
190. von Hippel, E. (1988) op.cit. p.29.
191. YACSI (2002) op.cit. p.26.
192. Druin, A. and Fast, C. (2002) op.cit. p.19.
193. Vygotsky, L.S. (1962) 'Thought & Language.' Cambridge MA: MIT Press.
194. Druin, A. (2002) op.cit. p.19.
195. Druin, A. and Fast, C. (2002) op.cit. p.19.
196. Matthews, H. (2001) op.cit. p.155.
197. Barber, T. (2007) op.cit. p.23.
198. Matthews, H. (2001) op.cit. p.16.
199. Matthews, H. and Limb, M. (2003) Another white elephant? Youth councils as democratic structures. 'Space and Polity.' 7, pp.173-192.
200. Ibid.
201. YACSI (2002) op.cit. p.26.
202. Ibid.
203. Peel, M. (2006) Jam-maker hits at government recipe for young entrepreneurs. 'Financial Times.' 13 May 2006. Available at: <http://www.ft.com/cms/s/0/4b932642-e21d-11da-bf4c-0000779e2340.html?ncklickcheck=1> [Accessed on 9 December 2008].

204. Karlin, S. (2004) *op.cit.* p.26.
205. YASCI (2002) *op.cit.* p.26.
206. Peel, M. (2006) *op.cit.* p.30.
207. McKay, S. et al. (2005) *op.cit.* p.187.
208. Hunt, F. (2007) 'Communications in Education.' Centre for International Education, University of Sussex. Available at: http://www.dcern.org/portal/documents/EducationSummaryPaper_001.pdf [Accessed on 13 February 2009].
209. National Statistics online. Available at: <http://www.statistics.gov.uk/CCI/nugget.asp?ID=8> [Accessed on 20 December 2008].
210. BECTA Home Access Website. <http://becta.org.uk/homeaccess> [Accessed on 20 December 2008].

Karlin reported structural barriers to innovation in an account of a student who invented a flexible computer keyboard. Frustrated by lack of patent guidance, she organised a network of like-minded collegians to help her work out how to proceed. The network developed into Young Inventors International.²⁰⁴

We have noted the importance of social, practical, emotional or financial support in facilitating youth-led innovation. Lack of such support emerges from the literature as a barrier to the development of innovation, and focus group participants frequently mentioned both positive support and lack of it in their accounts of experiences.²⁰⁵ Peel noted that 17 year old Fraser Doherty sells jam from his grandmother's recipe, earning up to £7,500 a month. In 2004, he was presented with an Enterprising Young Brit award by Gordon Brown. However, Doherty thinks the government is more interested in the 'PR game' than in offering help to people like him:

*Whenever I have gone to government agencies for help, they haven't given any. If I was over 18, there would be all kinds of grants and a lot more in terms of training courses, facilities and cheap office space.*²⁰⁶

Doherty says that the government should concentrate less on giving high-profile awards to young business people and more on offering them practical assistance.

Technology is insufficiently accessible to all

Limited access to digital technologies can make innovation and diffusion harder. Such technologies provide access to databases, online spaces where potential innovators come together and information needed to develop new ideas. McKay *et al.* note that access to digital technologies is "still the privilege of only a very small number of young people worldwide".²⁰⁷ Hunt describes inequalities in access to new technologies in developing countries, where radio is still the most widely used means of communication and therefore the most inclusive.²⁰⁸ The rural poor are least likely to have access to technology. Frequent low literacy levels, where technologies rely on participants being literate to use many of their functions, further compound the problem.

Geography was noted by focus group participants to be a factor in access to innovation and use of technology to innovate. In the UK, 16 million households (65 per cent) had access to the internet in 2008. Households in the South East (74 per cent) were most likely to have internet access with those in the North East least likely (54 per cent).²⁰⁹ 1.4 million school-going young people have no access to the internet at home and over one million learners have no access to a computer at home.²¹⁰

6. Youth-led innovation can have benefits – but better identification of these is needed

There is plenty of youth innovation going on, but formal evaluation of its impact is lacking. Most literature on innovation, including the theoretical literature, does not relate specifically to young people (e.g. Barnes *et al.*'s research on deliberative forums designed to increase active citizenship,²¹¹ Flowers' paper on 'outlaw users'²¹²). Equally, most of the extensive literature on youth participation and engagement does not address innovation. Terminology in this area, for example 'inventors', 'innovators' and 'entrepreneurs' is diverse, confused and used inconsistently.

More robust evidence of impact is needed

While there is evidence of impact, much of the literature is descriptive and aspirational, rather than providing clear evidence of outcomes. Much of it is discursive rather than empirical and that which offers an evidence base tends to be small scale and focused on local or short-term initiatives without robust measures of impact. Rather, some of it describes *ad hoc* or informal activities; and even then, many such activities may not be picked up in the literature at all.

Examples were found of a range of benefits

Examples of evidence included children's self-reported journals^{213,214} in which they recorded their developments as 'innovators', documentary analysis, focus groups, interviews and observation.²¹⁵ Mitra provides one of the few longitudinal perspectives through data collected over two years in one high school in which student voice was being developed, and found a marked consistency in the growth of agency, belonging and competence.²¹⁶

It is possible that the more young people initiate an innovation, the more social, economic or emotional benefits might be gained. For example, in Camino's study where young people were active initiators, there were benefits in terms of youth development and adults overcoming negative attitudes to youth with whom they had worked on community concerns.²¹⁷

In her study of innovation in the context of club culture, Cunningham concludes that even where young people are using new technology and producing cultural goods underground for their own use, this provides economic as well as cultural value.²¹⁸ Markoff noted the impact of 1960s hippie culture on inventions and further adaptations in the development of personal computers and the internet.²¹⁹

- 211. Barnes, M., Knops, A., Newman, J. and Sullivan, H. (2004) Public participation and collaborative governance. 'Journal of Social Policy.' 33, pp.203-223.
- 212. Flowers, S. (2008b) op.cit. p.15.
- 213. Druin, A. (2002) op.cit. p.19.
- 214. Druin, A. and Fast, C. (2002) op.cit. p.19.
- 215. Camino, L.A. (2000) op.cit. p.23.
- 216. Mitra, D. (2004) The Significance of Students: Can Increasing "Student Voice" in Schools Lead to Gains in Youth Development? 'Teachers College Record.' 106 (4), pp.651-688.
- 217. Camino, L.A. (2000) op.cit. p.23.
- 218. Cunningham, H. (1998) op.cit. p.24.
- 219. Markoff J. (2005) op.cit. p.24.

220. Jeppesen, L.B. and Molin, M. (2003) op.cit. p.18.
221. Ibid.
222. Heath, A. and Potter, J. (2004) op.cit. p.14.
223. Druin, A. and Fast, C. (2002) op.cit. p.19.
224. Ibid. p.208.
225. Jeppesen, L.B. and Molin, M. (2003) op.cit. p.18.
226. Mitra, D. (2004) op.cit. p.32.
227. Fielding, M. and Bragg, S. (2003) 'Students as Researchers: Making a Difference.' London: Pearson Publishing.
228. Fielding, M. (2004) "New Wave" Student Voice and the Renewal of Civic Society. 'London Review of Education.' 2, pp.197-217.
229. Bragg, S. (2007b) "Student Voice" and Governmentality: The production of enterprising subjects? 'Discourse.' 28, pp.343-358.

Jeppesen and Molin's study of innovation in the online gaming communities noted economic benefit going to companies who can manipulate consumer innovation into product design.²²⁰ They give the example of Minh Lee, who as a student developed *Half-Life: Counter-Strike* that had an existing game (*Half-life*) as its engine. Lee's innovation was a huge success, providing economic benefit to the makers of *Half-Life* whose product was needed to play *Half-Life: Counter-Strike*.²²¹ Further examples are given in Heath and Potter.²²²

Early innovation experiences can develop the capacity of young people for innovation

Druin and Fast identified a process through which children developed from 'learners' (absorbing, understanding and making sense of the process of invention; learning what inventors do to solve problems) to 'critics' (recognising what is good and bad in inventions around them) or 'inventors' (suggesting new ideas to be invented), though less often becoming co-designers (working with others in the invention process).²²³ In the first year of self-recording their development in journals, only evidence of 'learners' was identified, but over a three year period, 20 of the 27 children recorded changed 'identities' from learners to critics or inventors. The authors commented:

*... it was encouraging to see that children can move from learning about the process of invention to actually contributing to the invention experience.*²²⁴

However, our review focuses on innovation rather than invention, requiring not just the suggestion of new ideas but the adoption and implementation of them.

Jeppesen and Molin describe how online computer gaming communities adapt and innovate around products.²²⁵ Here they see learning between users in what they call 'interactive consumer learning processes', where innovation is driven by the social interaction around the existing product and the adaptations that are being made between community members. Learning communities of this kind develop practices that help consumers communicate about their problems (including language, behavioural codes, etiquette and norms). Learning can be lower-level, that is structured by the design limits set by the company; or higher-level where the limits set by the design firm are contested and innovation can become more radical, leading to new products. Consumers might come to the community for advice on how to deal with problems in the game; test out and ask for advice on innovations; and test the limits of the product. Learning (and thus innovation) takes place independently of the firm, but feeds back into the organisation.

Much of the literature reviewed focused on adult-initiated activity designed to increase young people's engagement, influence and possible subsequent innovation. In this sense, some of these initiatives may be building capacity in young people, and the institutions and environments in which they live, to innovate in the future. The lack of longitudinal data limits this to supposition, though in one of the only longitudinal studies reviewed, Mitra concluded that student voice can create meaningful experiences for young people that help meet fundamental development needs and create capacity for future action.²²⁶ The research on students-as-researchers²²⁷ could be seen as contributing to this capacity building, since it is designed to move schools and students on from what might be described as 'students as data sources' to 'students as knowledge creators'.²²⁸

However, Bragg argues that while students do grow in self confidence, independence and communication skills as a result of being trained in research skills and given responsibility and leadership in schools, there is a dominance of middle class and corporate discourses in some schools which marginalise non-participants.²²⁹ Similarly, Schafer and Yarwood noted that 14-16 year olds trained to interview other young people led to them creating hierarchies

among themselves,²³⁰ although Mitra targeted low socio-economic groups and those for whom English was a second language, in her work on student voice.²³¹ These reservations almost certainly apply equally to many of the other youth-led activities reviewed, which suggests the need to address inclusivity in the proposed framework, forward strategy and programme.

The YACSI research, in studying how innovation can be made more sustainable among young people in Canada, using focus groups with 241 ‘of the most innovative youth’, concluded that young children can be taught the skills to innovate.²³² This is supported by the Druin and Fast research reported above.²³³

Policymakers, educators and youth organisations can support and encourage young people’s innovation, but much will remain outside institutions and adult influence

Often, innovation is not a managed process: it may be about young people experimenting in eCommunication or establishing their authority through activism. Many of these examples challenge the core structures and processes that are set up supposedly to promote greater participation and thereby encourage innovation, such as school councils or the UK Youth Parliament, which can contain and control young people, inhibiting further innovation.

Innovation is also unpredictable. The main or most important outcomes of innovation may not relate to the original intention. Many innovations have ‘spillovers’ that become more innovative or more widely adopted than the original idea. Furthermore, the literature suggests that processes such as eCommunication can lead to important innovations that are not always recognised as such.

There is evidence that adverse conditions such as poverty, exclusion or failure may motivate innovation in some individuals and groups. Acknowledging the role of rebellion and anti-authority culture in innovation implies encouraging its further development, but any recognition of it, or attempts to stimulate it, runs the risk of destroying it.²³⁴ This dilemma must be recognised by those seeking to promote innovation.

230. Schafer, N. and Yarwood, R. (2008) Involving young people as researchers: Uncovering multiple power relations among youths. ‘Children’s Geographies.’ 6 (2), pp.121-135.
 231. Mitra, D. (2004) op.cit. p.32.
 232. YACSI (2002) op.cit p.26.
 233. Druin, A. and Fast, C. (2002) op.cit p.19.
 234. Flowers, S. (2008b) op.cit. p.15.

7. The research identified directions for future programmes

235. Cabinet Office (2009) 'New Opportunities: Fair Chances for the Future.' Cm 7533. London: The Stationery Office. Available at: www.hmg.gov.uk/newopportunities.aspx [Accessed on 13 February 2009].
236. von Hippel, E. (2001) Perspective: user toolkits for innovation. *Journal of Product Innovation Management.* 18, pp.247-257.
237. Jeppesen, L.B. and Molin, M. (2003) *op.cit.* p.18.
238. Hendry, E. (2008) 'Developing innovative people through the education system.' London: NESTA.

There is strong interest in promoting youth-led innovation. The United Nations Convention on the Rights of the Child provides the context in which young people can expect to exercise their rights to public services and citizenship. The recent White Paper *New Opportunities: Fair Chances for the Future*²³⁵ proposes a strategic approach to encouraging innovation and enterprise, including targeted funding in 15 areas for young social entrepreneurs and for intergenerational volunteering and local innovation.

While evidence of the impact of youth-led innovation was limited, clear messages emerged about what supported and inhibited its development. In this context, we make a number of suggestions for future development. These draw on the insights of our focus groups of young innovators and those organisations that support them, who counselled us strongly against producing a single 'recipe' for innovation.

Develop Toolkits aimed at young people

A Toolkit is an innovation process in which the user controls the development within a given environment designed to support them. It provides the process or structure to support people to innovate within a domain (e.g. a product, service or political, civic or cultural activity). Toolkits contain tacit or implicit knowledge that support users in achieving their aims or to participate in a process. Von Hippel suggests that Toolkits should meet the criteria of enabling the user to learn by trial and error, provide flexible scope for solutions, be user friendly, provide access to a 'library' of standard modules and enable results to be easily created.²³⁶ They could be developed specifically for young people using well-structured websites or involve the development of a website as a Toolkit.

The proposal by Jeppesen and Molin that organisations might put out 'half-finished' products, which consumers work to finalise is similar to the ideas inherent in Toolkits.²³⁷ The Toolkits enable consumers to customise the product to their needs so they become environments within which users create their own stories or versions. A good example is the interactive *Second Life*, where the firm creates the virtual environment and the users create the action. Social networking sites are similar: firms provide the structure and users provide virtually all the content. Equally, the Toolkits described above enable users to develop their own games. This principle could be extended in the context of technological developments but also applied more widely to the design of public services including for example, the school curriculum, use of space in residential homes and in health services.

This would build on NESTA's previous work. Hendry's proposal for user-led information, advice and guidance for younger age groups²³⁸ provides a possible basis for this, though unlike Toolkits, does not explicitly imply ongoing opportunities for further development and customisation. Rolfe and Crowley recommended that for work-related learning and career

guidance websites, website designers should involve young people to better reflect their needs and internet use,²³⁹ something which this Toolkit proposal could progress.

Many of the organisations that were in contact with the research team during the project have developed components of toolkits, but there is scope for further development. We need an audit of currently available Toolkits to identify unmet needs. New toolkits could then be properly targeted with young innovators extensively involved in their development. The Toolkits can be revised, extended or rebuilt by the community within which they were developed.

239. Rolfe, H. and Crowley, T. (2008) op.cit. p.18.

240. See www.linkedin.com

241. Sebba, J. et al., (2007) op.cit. p.19.

Target the development or extension for young people of existing social and business networks

Such targeting could aim to close the innovation gap by encouraging social mobility. It is clear from the literature reviewed in this report that young people from a very wide range of backgrounds access social networking sites. The access of young people to business sites is likely to be much more limited and could be developed to provide support for youth-led innovation. This might be done through partnering between existing organisations that run business or professional networks, such as LinkedIn, a social networking site for professionals.²⁴⁰ These networks could support innovation in any of the three domains identified in this report.

Develop youth-led innovation through the media

A strongly emerging finding from both the literature and the focus groups was that negative attitudes towards young people are a major barrier to innovation and that this is exacerbated in the media. Both the language used to refer to young people and the tone of the coverage given them in the media needs to be addressed. There are three ways in which the media could contribute to promoting youth-led innovation:

- Involving young people in the development and production of television and radio programmes, ensuring that these are genuinely youth-led and not subjected to continuous adult direction and editing.
- Schools and youth groups developing their own radio and television stations (see examples in the research on personalised learning in schools²⁴¹) as a vehicle for youth innovation, both through communicating their ideas more widely and through running the process themselves.
- Using the media to celebrate the ways in which young people make a positive contribution, with examples of youth-led innovation in the development of products and services for helping others, creation of new technologies, improvements to civic society, and initiatives in art or music.

Develop a culture that supports youth-led innovation

The proposed programme developments need to go alongside a wider agenda aimed at influencing policy and practice as part of the longer term process of creating a culture that is more conducive to youth-led innovation. Embedding a culture of youth-led innovation seems to require both support and flexibility. Support can be emotional, through mentors

242. YACSI (2002) op.cit. p.26.
243. The Integrated Qualifications Framework (IQF) can be found at: www.iqf.org.uk
244. Percy-Smith, B. (1998) Children's Participation in Local Decision-Making: The Challenge of Local Governance. In Johnson, V., Ivan-Smith, G., Gordon, P., Pridmore, P. and Scott, P. (eds.) 'Stepping forward: children and young people's participation in the development process.' London: Intermediate Technology Publications, Ltd.
245. See www.dcsf.gov.uk/childrensplan
246. Rappa, M. and Debackere, K. (1993) op.cit. p.30.
247. Druin, A. and Fast, C. (2002) op. cit. p.19.
248. YACSI (2002) op.cit. p.26.
249. Adey, P. and Shayer, M. (1994) 'Really Raising Standards.' London: Routledge.
250. Hendry, E. (2008) op.cit. p.35.
251. Rolfe, H. and Crowley, T. (2008) op.cit. p.18.

or families. It can be social, perhaps through the networks or internet groups identified in the eCommunication research. Or it could be financial, such as increasing the number and quality of youth start-up businesses.²⁴² We make some specific recommendations for policy-makers and organisations promoting youth innovation.

- **Provide more staff development for adults working with children and young people on ways of promoting youth innovation**

This will mean influencing the development of the Integrated Qualifications Framework²⁴³ in ways that support youth innovation. Approaches to promoting youth innovation need to be incorporated into both the initial training and the ongoing staff development of the teaching and child care professions working with young people. For example, Percy-Smith highlights the training and capacity building of development workers in order to involve children and create greater 'space' for innovation.²⁴⁴ Furthermore, in the light of the Children's Plan requirements to consult young people about the services they receive, this training should include a focus on 'student voice'.²⁴⁵

- **Develop capability for youth-led innovation**

Rappa and Debackere's review of the role of young scientists in innovation suggested that opportunities to innovate independently from adults should be developed early.²⁴⁶ Furthermore, this and other evidence acknowledged that very young children can lead innovation, provided their capability is nurtured.^{247,248} This includes skills training as well as the problem solving, open-thinking and teamwork that underlies so much effective innovation. There is evidence from the literature that this receives insufficient attention and some evidence of specific barriers in schools to this, such as attitudes to new ideas. The research on thinking skills²⁴⁹ provides exemplars of how this can be addressed effectively. As Hendry suggests, this should be promoted through existing curricular developments, such as the Primary Review and the National Strategies, rather than by a separate 'innovation curriculum'.²⁵⁰

- **Review the structures intended to support the development of youth-led innovation**

Rather than promoting youth-led innovation through participation as intended, some school councils, regional youth parliaments and other similar structures, can inhibit genuine innovation by diverting energy into procedural activities and marginalising the majority of young people who are not directly involved. There should at least be a major review of the purposes and development of these structures, and consideration should be given to favouring approaches that embed a culture of innovation more inclusively. Where structures are created, they should be a response to demand from young people themselves.

The organisations that campaign on behalf of young people are wide-ranging, fragmented and not clearly identifiable. They should be encouraged to work together; for example on issues such as legal barriers that hinder young people from commercialising their innovations.

- **Create opportunities in and out of school**

Our literature review has shown a need for cultures in which innovation can flourish. Young people need the space to innovate. This includes online and physical spaces. It also means emotional support, the chance to discuss ideas with their peers, time to innovate and access to adults. Role models and mentors are also important. And young people need the flexibility to allow innovation to occur without excessive controls or restrictions. All those who want it should have access to technology and information that will support their innovation. Rolfe and Crowley's suggestion for spreading good practice through the Schools' Enterprise Education Network provides one approach to this.²⁵¹ Some of the organisations supporting youth-innovation who participated in the workshops described effective approaches. Bringing young innovators together,

in particular with those who have overcome the barriers, seems to be helpful. It is particularly important to create space for innovation within current structures such as the school curriculum, youth groups and work experience.

- **Recognise, celebrate and reward organisational support for youth-led innovation through existing schemes**

Practices identified as particularly effective are recognised through programmes such as specialist schools, extended schools and eco-schools, where good practice is 'badged'. The Specialist Schools and Academies Trust is already actively promoting student voice. But within these and other schemes, greater priority could be given to supporting youth-led innovation. This requires discussion with policymakers and schools that might be interested in developing these routes to recognising their work in supporting young innovators.

Future programmes need to build an evidence base of 'what works'

A number of ideas for future programmes and research directions emerged from the project. However, in order to build on the evidence base, maximise coherence and deploy resources effectively, the first priority would be to pilot and evaluate work on one or more of the proposals above.

Towards a framework of youth-led innovation

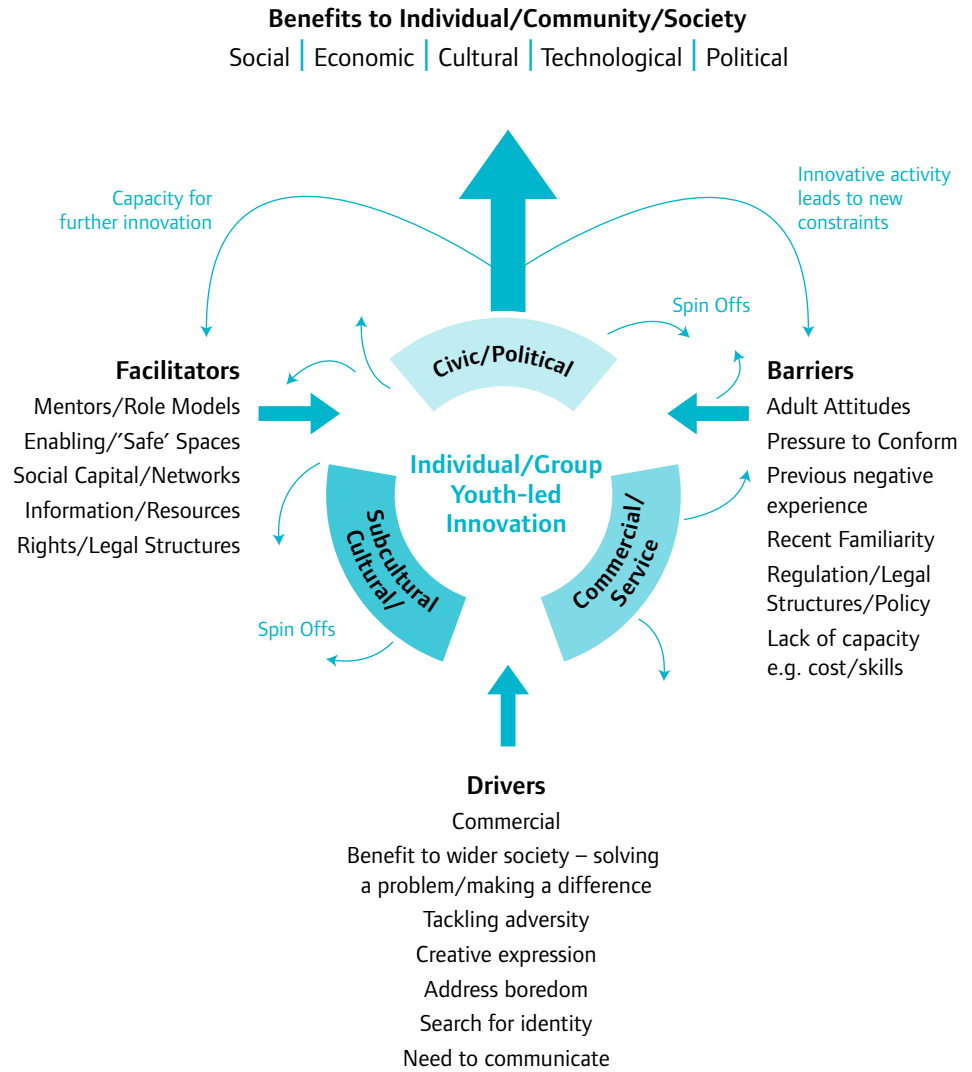
Drawing on the findings from the literature, Figure 2 shows the many ways in which youth-led innovation appears to develop and some of the facilitators and barriers. At the base of the diagram are a number of drivers of innovation which may lead to ideas that are generated through student activism (in the civic/political domain), social networking or eCommunication by individuals or groups (in the cultural/subcultural domain) or product development (in the commercial and public services domain). If an individual or group takes this innovation forward (into the centre), it may then be developed and have influence or impact socially, economically, culturally, technologically or politically (top of diagram) with potential wider social benefits.

Innovation can have unintended spin offs, both positive and negative, and can both create capacity for further innovation, perhaps through increasing the confidence or contacts that a young person has established, or lead to new constraints such as restrictions to internet access.

The facilitators and barriers that might operate in this process are outlined on either side of the framework, acknowledging that some barriers are simply the converse of a matched facilitator (e.g. financial support/lack of financial support) and other barriers (e.g. pressure to conform) may sometimes become a facilitator (e.g. through being a driver for political activism).

Figure 2: Towards a framework for youth-led innovation

Towards a framework for youth-led innovation



Appendix: About our review of the literature

The objectives of the research given in our proposal to NESTA were as follows:

- reviewing the literature on youth-led innovation and identifying evidence of its impact in terms of social, cultural, economic, technological and political benefits;
- providing evidence if available, that involvement in innovation increases the propensity and capacity of young people to innovate;
- providing evidence of the barriers and facilitators to youth-led innovation;
- developing a 'typology' or 'framework' for youth innovation which provides explanatory value in terms of the contexts, motivations of organisations and young people, and types of innovation;
- making recommendations to NESTA and public policy/programme makers on possible future strategies/programmes to promote youth-led innovation.

Electronic searches were undertaken on 23 databases using a wide range of search terms (see below for a list of databases and search terms used). This process provided 513 references which were recorded in an EndNote database. The titles and abstracts of these were then screened for relevance and other criteria for inclusion as follows:

- process, product and service-related innovations;
- examples of innovations in different areas, e.g. music, art, IT, language;
- subcultural and countercultural movements;
- examples of different spaces used for innovation, e.g. school councils, youth parliament;
- factors which encouraged/discouraged innovation;
- overarching texts/theoretical works;
- changes being made as a result of youth involvement/decision-making;
- empowering youth – this generally was in the form of small scale projects;
- youth being involved, rather than just participating, in processes, e.g. key player in a research project;

- youth working as partners with adults, rather than just participating, in developing thinking/implementing innovation. This included youth in design processes;
- youth participating in policymaking/as change agents;
- innovation as exploration of identity;
- research relating to organisations renowned for supporting youth enterprise;
- research about factors necessary for/influencing youth innovation/enterprises;
- research relating to social theory around youth innovation;
- literature reviews on youth leadership;
- research on involving hard-to-reach youth.

This gave us a list of around 65 references which were then obtained or ordered for reviewing. The publications were read and notes made on a proforma that addressed the elements of the study and the methodology, main findings and references to other relevant work.

Databases searched for the literature review

ABI/INFORM Global

BHI (British Humanities Index)

Business Source Premier

British Education Index (also covers Australian Education Index and Educational Resources Information Center – ERIC)

Eldis

Google

Google Scholar

ILO

Informaworld

IngentaConnect

International Bibliography of the Social Sciences (IBSS)

JSTOR

OCLC FirstSearch

PsycARTICLES

PsycINFO

Sage Journals online

Scopus

SourceOECD

Springer Publisher database

Wiley Interscience

Zetoc

Search terms

Age	Verb/noun	Sector/area
Youth	innovation	Mobile phones
Young	development	Music (rap, hip hop, grunge, drum and bass etc.)
Children	entrepreneurship	Graffiti/street art
Students	youth-adult partnerships	Language/slang
Pupils	activism	Fashion
Learners	leadership	Playground games
	governance	Crime
	influence	Texting/new literacies
	participation	Youth parliament
	engagement	Youth forum
	alliance	Youth/school council
	civic actors	Sports
	change agents	Business
	design	Gifted and talented
	create	Church
	user-centred innovation	Youth groups
	learners as creators	Social movements
	enterprise	
	voice	
	invention	
	improvement	
	progress	
	directed	
	decision makers	
	service-learning	
social innovation		
	* user-centred with all above	
	* user- ... and all above	

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Published: July 2009
YL1/20

