Impact case study template (REF3b)

Title of case study: Development of Inclusive Participative Media

1. Summary of the impact (indicative maximum 100 words)
Established in 2002 in London Metropolitan University's Faculty of Computing, Gamelab UK is a research and innovation centre in interactive educational media. By 'pushing the envelope' in production and development Gamelab has become the pre-eminent centre for the development of TV, and interactive media and games, for audiences and end-users with special education needs. Gamelab's impact includes over seven hours of television output for the BBC, eight BAFTA nominations since 2008 and a range of published, and highly innovative, games and interactive software for children, teenagers and young adults with sensory impairments, learning difficulties and other disabilities.

2. Underpinning research (indicative maximum 500 words)
Since 2005 Gamelab has been producing interactive software and TV content for users and audiences across the widest spectrum of disabilities, including: deaf and hearing impaired children and young people; blind children and young people; children, young people and adults with learning difficulties; young people on the autistic spectrum; young people with physical disabilities. Amongst others, this has included: *Performing Hands* - an interactive resource supporting English Literacy, at Key Stages 1/2, for deaf children; *Sos and the Big Maths Adventure* – an interactive audio resource supporting maths, at Key Stages 1/2, for blind children; *Plannet* – an online transition planning toolkit for young adults with learning difficulties; *Us5* – an online series of short films - with interactive, branched narrative outcomes - supporting independence and self-determination for young adults with learning difficulties; 6 individual TV programmes for BBC Learning, including PSHE for young people with severe learning difficulties and music for children and young people with general and severe learning difficulties; *uKinect*– an interactive Makaton sign-recognition system for young people with communication difficulties due to a severe learning difficulty or autism spectrum condition exploiting Microsoft's Kinect sensor technology.

Gamelab's work has been driven by a model of action research - involving extensive field studies with practitioners, clients and service users of external partner organisations – and practice based research while developing and implementing innovative technology solutions.
Its first disability-related project, *The Aesthetics of Access*, was produced in conjunction with Graeae Theatre Company – the UK's leading company of disabled directors and actors. Graeae's work is based on an approach that seeks to address issues of inclusion and access in the aesthetic structure of their theatrical productions. Gamelab has sought to apply this approach to its own interactive media and televisual output. In particular this informed and underpinned the development of our online accessible mediaplayer which includes innovations in access services, such as the provision of visual captions for people with learning difficulties, as well as enabling access for users across the spectrum of disabilities and sensory impairments. This player has been used by BBC Ouch! - the BBC's online service for disabled people - and for *uScreen*; an online resource for young disabled film makers developed by Gamelab for the UK Film Council's Screen South.
Research partnerships have been fundamental to Gamelab's ability jointly generating innovative technological solutions. While developing resources for BBC Jam it worked with computer scientists at the University of East Anglia to develop a BSL signing avatar, and with the Danish company AM3D to develop a digital audio engine using synthetic binaural stereo to generate a virtual 3D audio space and organisations in France to interface Flash with braille displays without needing to go through the unnecessary complexity of an intermediate screenreader.

Typically, Gamelab's projects involve significant accompanying research with specialist organisations, specialist practitioners and groups of people who represent target end users. As

well as those mentioned above, these have also included national charities (e.g. The Autistic Society, Mencap, The Royal London Society for the Blind, The Sign-Bilingual Schools' Consortium, Guide Dogs for the Blind Assocaition), schools and education establishments with a particular specialism in their individual field. Each project's development phase is underpinned by this research; ensuring Gamelab's work is informed by theory and practice, is technologically innovative, addresses specific gaps in the market and is tailored to the particular needs of end-users.

3. References to the research (indicative maximum of six references)
2006: BBC Jam – development and production of interactive learning resources for children and young people, including; *Performing Hands*; *Sos and the Big Maths Adventure*; *MyFuture* (funding £1.25 million)www.performinghands.com Username: Gamelab password:gamelab1

2007: *Plannet*; for Mencap (funding £105k)www.plannet.org.uk

2007: *Us5*; for BBC Ouch! (funding £80k)http://www.bbc.co.uk/ouch/play/us_5.shtml

2008: *SEN Skills for Life*; for BBC Learning (funding £200k) http://www.bbc.co.uk/learningzone/clips/sneezing/6731.html

2009: *PSHE for SEN*: for BBC Learning (funding £90k) http://www.bbc.co.uk/learningzone/clips/dealing-with-feelings/6706.html

2010: BISCT – Blind Cricket Simulation http://www.jisc.ac.uk/media/documents/programmes/elearning/ltig/BISCT_Final_Report.pdf

2011: uKinect project - http://www.gamelabuk.com/?page_id=592 Total funding to date: £150k Gamelab continues to develop a gesture-recognition communication system for people with verbal impairments The development work has been as much about user engagement as it is about technology application.

2012: *Make a Musical*; for BBC Learning (funding £120k) http://www.bbc.co.uk/schools/teachers/make_musical/

4. Details of the impact (indicative maximum 750 words)
Gamelab's SEN output falls into two main areas: Interactive media / games and linear video TV production.

Innovation in interactive technologies, for children with sensory impairments (i.e. deaf and blind), underpinned Gamelab's earliest outputs and has set the standard since. Gamelab's work is characterised by coupling robust education/learning objectives coupled with novel and innovative technological solutions to enable specific groups of users to achieve those objectives. Together with Jonathan Hassell** at the BBC, Gamelab coined the terms 'beyond inclusion' and 'reverse inclusion' for their products aimed specifically at particular disabled audiences, but with sufficient production value to appeal to audiences without disabilities due to their fresh approach to learning (see: http://www.hassellinclusion.com/2011/10/beyond-inclusion-and-reverse-inclusion/). These ideas have impacted such works as: the British Accessibility Standards BS 8878 (http://www.hassellinclusion.com/bs8878/); and initiatives like RLSB's 'Everybody Technologies' (see: http://www.hassellinclusion.com/2012/12/everybody-technology-innovation/).

While producing *Performing Hands* for BBC Jam, Gamelab developed interactive signing avatars (with signs being driven by XML data); a video mirror, supporting users to learn sign language through webcam relay; an action book concept; a British Sign Language dictionary with signing avatars.
This was the first time digital solutions had been utilised in a learning resource for deaf

children.

Utilising 3D audio, *Sos and the Big Maths Adventure* presented a series of interactive audio games to support blind children with maths learning. This was another first, and is being taken forwards in our current work with Guide Dogs for the Blind Association to help blind children learn mobility skills.

The fully accessible user interface design that was employed for *MyFuture* incorporated a fully accessible video player. Much of this accessibility work was developed in partnership with the BBC and helped inform accessibility design for the BBC's iPlayer.

The impact of Gamelab's work pioneering the use of Kinect to help support the communication and rehabilitation needs of different disabled groups is more recent and growing. From winning one initial speculative bid for money from TechDis, the competences that Gamelab has grown have already resulted in the development of products for three diverse disabled groups, with many other spin-offs under consideration.

In the area of television, Gamelab has provided age-appropriate televisual content dealing with sensitive issues and subject matter not previously tackled in this way for the target audience of young people with learning difficulties. Dissemination of these outputs has been via transmission through BBC channels and networks of school SENCOs (Special Educational Needs Coordinators). These outputs continue to be available as online teaching/learning resources through BBC Learning Zone Broadband for seven years from their first transmission. Prior to producing its television outputs, Gamelab's discussions with partners, including colleagues from the charity Mencap, highlighted three main issues in relation to media resources for people with learning difficulties:
- a lack of media resources targeted at this particular audience;
- resources that existed were of low production value;
- very little age appropriate material was available.

Gamelab has sought to address these issues in its broadcast and online televisual resources. In relation to their content, these materials are seen as highly original and of high production value – as evidenced by the many BAFTA nominations associated with much of the output. They are seen as highly relevant to the needs of their specific target audiences and informal feedback indicates high levels of usefulness. There is also evidence of the materials being of use beyond the school context (e.g. by health professionals). Dealing with basic skills for life through to more difficult issues such as body changes which young people find difficult at the best of times but young people with autism find particularly difficult to deal with. Gamelab has added to this music content – again written and developed at a cognitively appropriate level whilst still being age appropriate.. Music has proven to be a suitable topic for this particular audience again because of the lack of age appropriate material as well as providing a vehicle for emotional exploration. So far Gamelab has produced three such programs for BBC amounting to 3 hours of transmitted output (this is an addition to a similar project also produced by Gamelab for the Welsh Government).

More recently Gamelab has been awarded grants from the Techdis and Technology Strategy Board for work in appliance of interactive technologies in assistive context. Microsoft's Kinect technology is being applied in various context such as recognition of Makaton signing and motion learning for blind children. One such development, uKinect – a signing game- was recently launched at the TRS SEN Exhibition as a commercial product in association with the Makaton Charity. This has too just been awarded a TIGA award for Best Educational Initiative. Additionally Gamelab is developing a web browser tool for disability access with support from TSB

Key grants and consultancies:
2006-present BBC total value in excess of £2m

2008 JISC   development of a proof of concept for training game for Blind Cricket £75k
2009 SCREEN SOUTH Interactive web space for disabled film makers uScreen.com £43k
2011 TECHDIS SBRI uKinect – application of gesture recognition to learning disability £150k
2013 Guide Dogs Association: A Motion training utility for blind children. £29k
2013 Technology Strategy Board : £35k towards the development of a disability web tool.

Gamelab has in fact been BAFTA nominated EIGHT times since 2008. This represents major national industrial peer group acclaim. Additionally Gamelab was nominated in the Japan Prize in 2012 - this is the prestigious international competition for educational media.

Gamelab has been awarded an award for Best Educational Initiative from TIGA the independent games association in November 2013.

Gamelab is also a finalist in the Guidedogs Association Partner of the Year Awards

** Jonathan Hassell is now also a visiting professor at Gamelab

5. Sources to corroborate the impact (indicative maximum of 10 references)

BBC Based activity:
Skills for Life - 2010 BAFTA Nomination
http://www.bafta.org/awards/childrens/2011-childrens-awards-nominations-winners,2169,BA.html
Also nominated in the BUFVC wards 2010
Sample Clip:
http://www.bbc.co.uk/learningzone/clips/its-your-period/6732.html

Wanna Be a Rockstar – Music for SEN - 2011 BAFTA Nomination
http://awards.bafta.org/award/2011/childrens/learning-secondary
sample clip:
http://www.bbc.co.uk/learningzone/clips/wanna-be-a-rockstar/12273.html

Make a Musical – finalist in the 2012 Japan Awards
http://www.nhk.or.jp/jp-prize/english/2012/entry-youth.html
nominated in BAFTA 2012
http://awards.bafta.org/award/2012/childrens/learning-secondary
sample clip:
http://www.bbc.co.uk/learningzone/clips/13692.html

Boy from Before - Film for BSL Zone (the Deaf Channel)
http://www.bslzone.co.uk/bsl-zone/boy/?subs=subs

Contact details for individual corroborations from the BBC, Riverside School, Techdis, Hassell Inclusion
and Guidedogs Association may be found on the REF System