

Impact case study (REF3b)

Institution: Newcastle University
Unit of Assessment: 25 Education
Title of case study: The future of learning: Self Organised Learning Environments (SOLES)
1. Summary of the impact

Self Organised Learning Environments (SOLES), characterised by our innovative pedagogies and models of enquiry-based learning, are changing the culture of classrooms and inspiring many thousands of educationalists in schools and other organisations. This impact culminated in the 2013 award to Mitra of the annual TED prize (\$1million). Teachers have been inspired to find new enquiry-based ways to encourage students to work together, solve problems and become more engaged in learning with minimal intervention from the teachers themselves. SOLEs have been implemented in schools and other educational institutions resulting in change in the attitudes and practices of teachers, head teachers, education policy makers, education experts and private companies. Impact has extended to 27 countries across 5 continents including India, UK, Argentina, USA, Australia, China, Finland and Qatar. This research has become a global phenomenon, influencing all phases of education (primary, secondary and tertiary) and also the training and development of teachers. The research also inspired the film ‘Slumdog Millionaire’.

2. Underpinning research

Self Organised Learning Environments (SOLEs) are models of learning in which students self-organise in groups and learn around a computer with minimal teacher support. Sugata Mitra’s (Professor of Educational Technology, 2006 to date) research (April 2007-Dec 2009, Orient Global Foundation) with Suneeta Kulkarni on the ‘Design, development and deployment of SOLEs for children’ aimed to build upon his earlier ‘Hole in the Wall’ experiments (carried out between 1999 and 2006). The earlier research demonstrated children’s ability to learn independently using computers. Mitra’s research on SOLEs typically assesses students before and after different kinds of SOLE situations that often involve various forms of mediation to support student learning **(4)**. Assessments are usually curriculum related but pitched at a standard higher than the level students are used to.

Mitra’s 2007-9 funded research project focused on designing, constructing and investigating 12 of his unique SOLEs in disadvantaged areas of Hyderabad and Sindhudurg, Maharashtra, India. The low quality of education in rural areas in India provided a strong case for the use of technology to enhance student access to learning **(1)**. This research showed Tamil speaking children in a remote Indian village were able to learn basic molecular biology in English, initially on their own and later with a mediator without subject knowledge, and found evidence that these children could reach similar levels of learning as children in formal ‘advantaged’ schools **(2, 4)**.

SOLE experiments were conducted in Uruguay, where almost every child has an internet connected laptop, to look at children’s attempts to answer questions in groups, to read beyond their expected levels in Spanish and English, and to see if children would read better in groups than individually. The questions answered were on curricular subjects the children had not yet been taught and were regarded by the teacher as ‘hard’ questions. Results found that the children involved performed ‘hard’ problems better in groups than they did individually and they were also shown to be capable of researching effectively using the Internet **(3)**.

By 2010 schools all over the world were starting to show an interest in SOLEs. It was also at this time that Mitra joined forces with CfLaT (Centre for Learning and Teaching) researchers in two projects that combined Mitra’s previous research with a decade of CfLaT research on enquiry-based learning **(5)**. To facilitate this development, the university funded a teaching fellow post (Dolan, teaching fellow, 2010-13). The two projects were funded by the University and by Beacon Fund, UK, and were: “Conception and Deployment of a Self Organised Mediation Environment (SOME) for Children” (June 09-Mar 13); and “Developing the Potential of Retired Skype Mediators - Skype Grannies” (Jan-June 2011). Both projects shared two goals: to develop the concept of SOLEs within schools in the UK; and to integrate findings of SOLE research with those of CfLaT research on enquiry-based learning. The first project involved Mitra, Leat (Professor of Curriculum Innovation, 1989-present), Dolan and Wall (lecturer 2006-2011), working in collaboration with a North East England primary school teacher from 2009-11. This first project explored the processes and impact of SOLEs for use within primary school classrooms. The project found an impact on

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practice in primary classrooms (for example, the opportunity to reflect on pupil learning led to changes in teaching such as raised teacher expectations) and on pupil engagement in learning. There was evidence of transformative innovative practice that seemed to be positioned alongside, rather than in conflict with, the dominant educational framework (6). This first project led to the development of a handbook for teachers that has since become the 'SOLE Toolkit' published by TED (Technology, Entertainment, Design). The second project investigated the mediation of children's learning via skype, with the mediator being an interested adult in another country. It looked at skype mediation within SOLEs involving children in the UK and India and retired skype mediators in the UK. This second project involved Mitra, Leat, Dolan, Clark (senior research associate 2001 to date) and Thomas (research associate 2006 to date). 40 mediators conducted more than 200 hours of contact with children. Findings illuminated the motivation and characteristics of the mediators and the infrastructure needed to support, reward and extend their engagement work (4).

3. References to the research

1. Mitra S, Dangwal R, Thadani L. Effects of remoteness on the quality of education: A case study from North Indian schools. *Australasian Journal of Educational Technology* 2008, 24(2), 168-180. REF2 output: 76711. <http://www.ascilite.org.au/ajet/ajet24/mitra.pdf>
2. Mitra S, Dangwal R. Limits to Self Organised Systems of Learning - the Kalikuppam Experiment. *British Journal of Educational Technology* 2010, 41(5), 671-688. REF2 output: 161718. DOI:10.1111/j.1467-8535.2010.01077.x
3. Mitra S, Quiroga M. Children and the Internet - A preliminary study in Uruguay. *International Journal of Humanities and Social Science* 2012, 2(15), 123-129. http://www.ijhssnet.com/journals/Vol_2_No_15_August_2012/15.pdf
4. Mitra, S (2012). *Beyond the Hole in the Wall. Discover the power of self-organised learning* [ebook], with a Foreword by Nicolas Negroponte, TED Books, 2012. Available from HEI on request.
5. Leat D, Lin M. (2003) Developing a pedagogy of metacognition and transfer: Some signposts for the generation and use of knowledge and the creation of research partnerships. *British Educational Research Journal*, 29(3), 383-415. DOI:10.1080/01411920301853
6. Dolan, P., Leat, D., Mazzoli Smith, L., Mitra, S., Todd, L., and Wall, K. (2013) Self-Organised Learning Environments (SOLEs) in an English School: an example of transformative pedagogy? *Online Educational Research*. REF2 output: 196125.

References 1, 2, 3, 5 and 6 have been through a rigorous peer review process. 4 is a comprehensive summary in a narrative form of all research projects outlined in Section 2. Its innovative online form and narrative genre is deliberately aimed at an audience that includes academics and the general public.

Investigators(s)	Grant Title	Sponsor	Dates	Value
Tooley (PI), Mitra & Dixon	Competition, Innovation and Change in Education Markets for the Poor	Orient Global Foundation	Jan 2007 to Sept 2009	£1,019,019
Mitra (PI)	Self Organised Literacy	One Laptop Per Child	Aug 2011 to Jul 2012	£48,947

4. Details of the impact

SOLE's impact has been transformative in terms of the range of organisations and individuals who have been inspired or whose behaviour has been changed. Since 2008, Mitra has been invited to deliver on average 25 keynote speeches a year to different educational practitioner and policy audiences in 27 different countries across all 5 continents. Educators in schools and in a range of other global non-educational organisations have been inspired, including: British Council, Google, The Commonwealth of Learning, Cisco, John Templeton Foundation, Learning and Teaching Conference, International Congress on Distance Learning, National eLearning conference, Italian Foundation San Paolo, ICC International Language Network, Distance Educators conference, Learning Futures, British Computer Society, ICT (Information Communication Technology) in Education Networks, Learning and Skills Improvement Service and Open Internet Summit. In 2010 Mitra also became one of the few people who have been invited to give a second TED

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(Technology, Entertainment, Design) talk (the first in 2007), titled 'The child-driven education', which has been viewed more than 1.6 million times. The innovative pedagogies arising from this research on SOLEs have been trending on Twitter. Mitra's TED Prize Talk (2013) on SOLEs has been viewed over 1.7 million times on TED.com and TED's YouTube channel and over 60 major press articles written about the work (e.g. NYTimes, TIME, BBC, Times of India). The 'SOLE Toolkit' on the TED website, based on research carried out by Mitra, Dolan and Leat, has been downloaded over 16,000 times and a number of blogs have been posted on the TED website that evidence international impact, for example from schools in Ontario, New York, Melbourne and Columbia (**IMP1**). Mitra's research also inspired the multi-Oscar winning film *Slumdog Millionaire*. Vicar Swarup, the author of the book on which the film is based, speaks of coming across a news report of how slum children had begun using an internet facility entirely on their own (**IMP2**).

The 2013 TED prize is evidence of substantial international impact. According to TED Director Lara Stein: "*The TED Prize is a forward-looking prize, and we award it to individuals who have demonstrated significant achievement that the prize wish can build on. Sugata has not only created a remarkable body of research around self-directed learning, but he has support from teachers around the world who are tapping into his methodology with great success.*"

Mitra has other awards for the impact of his research on schools. In 2011 Learning Without Frontiers awarded Mitra its Special Achievement Award "*to an individual who has, in the opinion of the judges, had the most impact during 2010 on radically improving learning or positively disrupting traditional methodologies through the use of affordable, disruptive technologies*". In 2011 Mitra was awarded the Klingenstein Leadership Award for his current research which "*is leading toward an alternative primary education, using self-organized learning, mediation, and assessment environments*". In 2012 Mitra was awarded the Advanced Global Educator Award (2012) which "*is presented to individuals who have demonstrated unparalleled leadership in promoting and advancing excellence in global and international education*". Many media articles have referred to SOLE research, such as one in *The Guardian* 3 March 2009 entitled 'Slumdog Professor', by Lucy Tobin. Similarly, an article was written by Matt Ridley, *Wall Street Journal*, December 2010 (**IMP3**). See also items in *The Telegraph* 14 April 2010 and BBC 30th April 2012 (**IMP3**).

SOLE research has had impact on schools, private companies and on leading opinion formers. There is evidence of impact on classroom practice and student learning in Australia. As a result of the work of the principal of a primary school, New South Wales, Australia, this research has, reports the principal, '*influenced our pedagogy and resulted in positive changes to the teaching and learning culture in our schools and is being adopted and utilised in a growing number of schools in our region*'. The principal talks of 'a change in mindset in terms of how they (teachers) teach'. Examples are given of impact on students: '*student enjoyment and engagement in their learning has increased*' and as a result '*classroom misbehaviours are virtually non-existent during SOLE learning*'. A SOLE Australia Network Wiki for online learning and sharing has now been established (<https://soleaustralianetwork.wikispaces.com/>). The principal has promoted this model of learning at numerous conferences in both Australia and New Zealand. As a result, he reports, '*a variety of schools from different settings are now enthusiastically trialling SOLE*'. The primary school is now recognised as a pioneer of self-organised learning and as a result attracts a continuous flow of visitors from other schools across Australia. The principal has been approached by the largest school region in New South Wales to lead a SOLE strategy across the region and provide training (**IMP4**). Coronation Public School (Canada) have started 'Kids Got SOLE' (<http://www.kidsgotsole.com>). The Director of '21st Century Schools', a US based education company specialising in professional staff development and curriculum design has shared research on SOLE to 25,000 subscribers globally. She has been inspired to study SOLEs in greater depth, altering her materials and processes in line with the ideas of SOLEs, telling many others about SOLEs. She notes: '*At 21st Century Schools we believe that Dr. Mitra's work is invaluable, and we see it as fulfilling of our vision and mission to promote his research to as many people as possible, especially educators*' (**IMP5**).

School impact of SOLE has also been national. An Ofsted report on Middlestone Moor Primary school, Durham, cites SOLE as evidence of good practice (**IMP6**). The Curriculum Leader for

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Design and Art at a High School (North Tyneside) states: *“the impact has been huge...whole school CPD is being developed on SOLE and interwoven into our school priorities”*. This leader has set up a network group to share practice across schools and promotes SOLE through presentations and Twitter. She says: *“the biggest impact has been...the learning that is achieved is outstanding and the levels of attainment much higher than groups that are taught traditionally”* (IMP7).

A classroom teacher who regularly used SOLEs between 2009-11, with a Year 4 classroom (8/9yrs) in an urban North East England primary school, in partnership with university researchers Dolan, Mitra and Leat described the impact on her teaching. A diary kept for a year (2010) evidences in detail the positive impact over time on her teaching practice, leading her to become more reflective, more able to see all her pupils as ‘learners’. She said: *‘I was able to see how the students would choose to learn without any input from me. It’s more representative of what they’re like. You feel like you know them a little bit better. They’re more themselves, there’s less pressure on them to perform, to do what they think I want them to do... It makes you think about how to operate in other lessons, like if you need to be ‘on the case’ all the time. It makes you think about why you teach in a certain style...It raises your expectations of what they’re able to do without your help. You can relinquish more control...It makes you reflect on your practice. You think about how you present non-SOLE lessons, how much time you give them to talk, how much time you give them to follow their own learning, how much structure is necessary’* (IMP8).

The Director of Arts at a High School, Durham, said Skype in the classroom implemented by Leat and Lofthouse (lecturer, 2003–on-going) had: *‘huge impact on the development of a new facility which can be accessed by the school and the community. The particular teachers involved have been amazed at some of the findings and have been surprised at students handing in high quality work a lot earlier than requested due to their interest and engagement during this research’* (IMP9).

An unexpected impact concerns the use of SOLE techniques in corporate and professional learning across all sectors, highlighted when Mitra won the Leonardo European Corporate Learning Awards ‘Crossing Borders, 2012’: *“Mitra has inspired education experts around the world to re-think learning methods and to develop a new learning design for talent management – in school education as well as corporate learning”* (IMP10). SOLE research has had a significant impact on leading opinion formers in the UK, USA and around the world. For example, references to Mitra’s research can be found in over 30 recent publications on the subject of technology and education including: *Mega-Schools, Technology and Teachers: Achieving Education for All* (2010) by Sir John Daniel; *Free to Learn* (2013) by Peter Gray; *Learning on Demand: How the Evolution of the Web Is Shaping the Future of Learning* (2012) by Reuben Tozman; *Century of the Child: Growing by Design, 1900-2000* (2012) by Aidan O’Connor; *Imagining India: and Ideas for the New Century* (2013) by Nandan Nilekani.

5. Sources to corroborate the impact

- IMP1: Posts on the TED prize blog from schools in which teachers have been inspired and teaching practice has changed. Available at: <http://tedsole.tumblr.com>.
- IMP2: Testimonial email from author Vicas Swarup to Mitra (15 Jan 2009).
- IMP3: Summary of media coverage available on request (i.e. “Turning Kids From India’s Slums Into Autodidacts”, by Matt Ridley, Wall Street Journal, December 2010. Available at: <http://on.wsj.com/1aTHnkY>).
- IMP4: Testimonial Letter from Teacher, Primary School, Australia (20 May 2013).
- IMP5: Testimonial Letter from Director 21st Century Schools, USA (22 May 2013).
- IMP6: OFSTED Best Practice document on Middlestone Moor Primary, Durham on 11 December 2012. Available at: <http://bit.ly/19URyqi>.
- IMP7: Testimonial Letter from Curriculum Leader for Design and Art, High School, North Tyneside, UK (16 May 2013).
- IMP8: Teacher’s diary, Gateshead Primary School in 2010, quoted in conference paper for European Conference of Educational Research. 2011.
- IMP9: Testimonial email from Director of School Arts, Secondary School, Durham (3 Sept 2013).
- IMP10: Leonardo Crossing Borders: Challenging established ways of thinking. Available at: http://www.leonardo-award.eu/content/e494/e1062/e1218/index_eng.html.