

Institution: The Open University

Unit of Assessment: C25 Education

Title of case study: The impact of mobile learning research on practice in a global context

1. Summary of the impact

Our research on learning using mobile technologies has impacted on:

- the process of developing new mobile learning platforms within Nokia and Guinti Labs
- the work by UNESCO, Nokia and Pearson on the Education for All challenge and policy briefing for UNESCO on mobile learning for social inclusion
- the use of mobile learning to improve English teaching in Bangladesh. The English in Action project is now impacting on over 4500 teachers. Within the pilot, teachers' and pupils' use of English exceeded 70% and 80% respectively, and pupils' English scores increased significantly. Funding is secure to 2014 to reach 12,500 teachers and 2.8 million pupils. This mobile learning model is now being established in Nigeria.

2. Underpinning research

Research on mobile learning within the Centre for Research in Education and Educational Technology (CREET) characterises learning as a collaborative, social process of knowledge construction, which is powerfully influenced by the technologies available in any specific context. MOBlearn (2002-05) was the first major research project on learning with mobile technologies, involving 24 international partners. Taylor at The Open University (OU) led its key 'User Requirements and Evaluation' package to develop educational and usability requirements for diverse learning contexts, and to evaluate the MOBlearn platform. This research theorised 'context' as a central concept in mobile learning, and identified aspects of physical, technological, conceptual, social and temporal mobility. Subsequently, Taylor and collaborators proposed a theory of learning for the mobile world (Sharples et al., 2007) which explores relationships between the learner and mobile technologies, and the ways in which these interact to advance understanding.

The Personal Inquiry (nQuire) project (2007–10) built on this, as part of the UK Technology Enhanced Learning research programme, and developed a model of mobile science inquiry, linking schools and informal settings. This work has been revised and extended to adult learning within the OpenScience Laboratory (2012–13) and to informal learning by young people through a grant from the Nominet Trust (2013–14). The Mobile Assistance for Social Inclusion and Empowerment of Immigrants with Persuasive Learning Technologies and Social Network Services project (MASELTOV) (2012–14) extends this research. It has constructed an 'incidental learning framework' which integrates learning services on smartphones with peer and volunteer support. It uses mobile services which are location-based, context aware, and enable opportunistic informal learning. These are combined with measures of learner progression and achievement.

Our research has addressed mobile learning which crosses contexts, where curriculum, timetable, and assessment are flexible. In 2004, the educational charity JISC commissioned a study of mobile learning practices across the post-16 sector in the UK led by Kukulska-Hulme, which addressed both on and off campus learning. Our contribution to the EU-funded MOTILL project (2009–10) focused on mobile lifelong learning, and developed a practice Evaluation Grid which included analysis of support for learning across settings. Sharples has further investigated learning across formal and informal settings and the ethics of research into mobile, ubiquitous and immersive learning. Surveys and interviews with adult mobile learners (2005–13), including an international survey of five institutions in 2010 (Kukulska-Hulme et al., 2011), have produced new knowledge about emerging learning practices with phones and tablets, and a framework for next generation designs for mobile-assisted language learning.

Another strand of research has focused on international contexts where there is limited access to

technology and connectivity. The Digital Education Enhancement Project (DEEP) (2001–05) led by Leach and Power investigated the use of new mobile technologies to support teachers' professional development within rural classrooms in Egypt and South Africa. It explored the effect of context on mobile learning, including local educational and language practices, and pointed to the importance of integrating professional development into daily classroom practices (Leach et al., 2006). The research and development project, English in Action (EIA), led by Banks and Power and funded through UKAID (2008–14) builds on this work, and on conceptualisations of practice focused teacher knowledge. It aims to improve English language teaching in Bangladesh. The research arm of the project has involved baseline studies; quantitative and qualitative studies of the extensive pilot phase; field trials of three low-cost models of mobile phone equipment in two rural locations; and conceptualisation of a school-based implementation model for learning using mobile phones which can be delivered at scale (the 'trainer in your pocket') (Walsh et al., 2013).

Key researchers

M. Sharples (since 2011), Professor of Educational Technology; A. Kukulska-Hulme, Professor of Learning Technology & Communication; J. Taylor, Professor of Learning Technologies; E. Scanlon, Regius Professor of Open Education; P. Lefrere (until 2008), Senior Lecturer; J. Leach (died 2007), Professor of Teacher Learning and Development; F. Banks, Professor of Teacher Education; Dr T. Power, Senior Lecturer; Dr M.M.C Shohel, Research Fellow (since 2009); and Dr C. Walsh (since 2010), Senior Lecturer.

3. References to the research

1. Kukulska-Hulme, A., Sharples, M., Milrad, M., Arnedillo-Sánchez, I. and Vavoula, G. (2009) 'Innovation in Mobile Learning: A European Perspective', *International Journal of Mobile and Blended Learning*, vol. 1, no. 1, pp. 13–35. ISSN: 1941-8647.
2. Kukulska-Hulme, A., Pettit, J., Bradley, L., Carvalho, A.A., Herrington, A., Kennedy, D., and Walker, A. (2011) 'Mature students using mobile devices in life and learning', *International Journal of Mobile and Blended Learning*, vol. 3, no. 1, pp. 18–52. ISSN: 1941-8655.
3. Leach, J., Ahmed, A., Makalima, S. and Power, T. (2006) *DEEP IMPACT: an investigation of the use of information and communication technologies for teacher education in the global south: Researching the issues*. Department for International Development (DFID), London, UK. ISBN: 1861927126.
4. Sharples, M., Taylor, J. and Vavoula, G. (2007) 'A theory of learning for the mobile age' in Andrews, R. and Haythornthwaite, C. (eds) *The Sage Handbook of E-learning Research*. London, UK: Sage, pp. 221–47. ISBN: 1-4129-1938-X.
5. Shohel, M.M.C. and Power, T. (2010) 'Introducing mobile technology for enhancing teaching and learning in Bangladesh: teacher perspectives', *Open Learning: The Journal of Open and Distance Learning*, vol. 25, no. 3, pp. 201–15. ISSN: 0268-0513.
6. Walsh, C., Shrestha, P. and Hedges, C. (2013) 'Mobile phones for professional development and English teaching in Bangladesh', *International Journal of Innovation and Learning*, vol. 13, no. 2, pp. 183–200. ISSN: 1741-8089.

All journals named above employ an anonymised peer review process.

Research funding

2001–05: £100,000 awarded by DFID to Prof J. Leach and Dr T. Power for a project entitled 'DEEP (Digital Education Enhancement Project)'.

2002–05: £185,000 awarded by the European Union (FP5) to Prof P. Lefrere for a project entitled 'MOBlearn'.

2005–14: £2,000,000 awarded by DFID to Prof F. Banks and Dr T. Power for a project entitled 'English in Action'.

2009–10: £28,695 awarded by the European Union (FP7) to Prof A. Kukulska-Hulme for a project entitled 'MOTILL (Mobile Technologies in Lifelong Learning)'.

2012–14: €368,072 awarded by the European Union (FP7) to Prof A. Kukulska-Hulme for a project

entitled 'MASELTOV (Mobile Assistance for Social Inclusion and Empowerment of Immigrants with Persuasive Learning Technologies and Social Network Services)'.

4. Details of the impact

Partnerships with external companies have translated research insights into the development of new mobile learning tools. A partnership with Giunti Labs (now called eXact Learning) used research on context-based services: as Fabrizio Giorgini explains 'part of the MOBIlearn technology had a concrete impact on the first version of our Mobile product. In fact we re-used part of the player for Win Mobile devices and part of the location-based services that used the RFID technology.' It laid the foundations for further versions of the platform and the company's subsequent mobile products. Another partner, Riitta Vanska, acknowledges the role of MOBIlearn in convincing Nokia to develop mobile learning: 'MOBIlearn gave me trust to push mobile learning in Nokia and after that the piloting and concepting work for mobile learning got more attention. I would almost say that all the projects (even MoMaths) have some elements coming from the learning from that project' (Riitta Vanska, originally Nokia, subsequently Pearson). The Nokia Education Delivery platform on mobile phones, influenced by MOBIlearn, was used in its MoMaths project, and a partnership with the Pearson Foundation and UNESCO to benefit developing countries. Sharples has provided continuing consultancy to Nokia on mobile learning.

In 2012 Nokia, UNESCO and the Pearson Foundation initiated an international Education for All challenge to find innovative applications of mobile phones for learning, with Sharples on the Jury. Kukulska-Hulme and Sharples are widely referenced in the UNESCO/ Nokia paper 'Mobile Learning and Policies' (Vosloo, 2012), identifying lessons learned. Kukulska-Hulme produced a UNESCO-commissioned Policy Brief on 'Mobile Learning for Quality Education and Social Inclusion', and chaired an industry-sponsored global Policy Makers Forum (2013). As a result of the MOTILL project, 24 formal declarations were signed by institutional and national policymakers, committing to the development of mobile learning across Europe. Sharples and Kukulska-Hulme are past presidents of the International Association for Mobile Learning which brings together researchers and industry professionals to take forward practice.

The significant international reach of this research impact is demonstrated through English in Action (EIA) funded through the UK's Department for International Development DFID (2009–14). The goal is to contribute to the economic development of Bangladesh through enhancing the English language competence of teachers, pupils and adult learners. EIA has already impacted on 4690 teachers through mobile learning, changing their educational practice, and aims to impact on 10.5 million children by 2017. It is a partnership with the Government of Bangladesh, Mott McDonald, BBC Media Action, two local NGOs (Underprivileged Children's Educational Programme and Friends in Village Development Bangladesh), and the University of Dhaka. The success in Bangladesh has led to a national programme, directly modelled on EIA, being established in Nigeria.

EIA has delivered school-based teacher development enabled by mobile technologies. The project initially used an iPod and then, drawing on insights from our research, shifted to a low-cost mobile phone kit, without internet connectivity. Mobiles are preloaded with learning resources, including over 400 audio and video clips, which are aligned with local educational practices, and a video narrator provides guidance and prompts for application to classroom practice. The contribution of the research arm to achieving this impact has been noted in the DFID 2013 annual review: 'sound evidence from research and from activities on the ground are produced and continually fed back to inform practice and adjust directions' (p. 25).

The project pilot reached 690 English teachers and 132,700 students. EIA is currently working with 4000 teachers, with a new cohort of 8500 already recruited. Following a positive annual review in May 2013, DFID is constructing the case for £19 million additional funding to mainstream the programme within national teacher development, estimated to reach at least 76,500 teachers and 10.5 million primary and secondary school children by 2017. Already the Diploma in Primary Education in Bangladesh has been redesigned to incorporate the EIA materials with changes being rolled out to training colleges from 2013.

Independent evaluations (quantitative and qualitative) undertaken by Trinity College (London), University of Dhaka and the Education Inspectors of the Government of Bangladesh, provide strong evidence of project impact in terms of change in teacher and student attitudes, practice, and English Language competence. The external assessment of teachers and students using Trinity College English Language scales has shown significant improvement on baseline studies. Almost all primary teachers achieved the English language competence to teach Class 3, while secondary teachers achieved competency to teach Class 6. Performance of pupils achieving initial Trinity grades increased to 50% (primary) and 67% (secondary). Talk in English increased significantly. Within primary classes it reached 72% for teachers and 81% for pupils and within secondary it reached 79% for teachers and 85% for pupils. The use of mobile devices has been 'shown to facilitate access to learning, as well as improving the quality of teacher education and training' (Shohel and Power, 2010, p. 213) which in turn is resulting in changes to classroom practices.

5. Sources to corroborate the impact

1. EIA evaluation reports on pilot phase available from <http://www.eiabd.com/eia/index.php/pilot-phase-reports> (accessed 16 October 2013).
 - Study 3a (2012) - includes quantitative data from Trinity College London on attainment of Teachers and Students.
 - Study 2a2 (2012) – includes quantitative data on sustained change in practices collected by Institute for Education and Research, Dhaka University, Bangladesh.
2. Annual review of EIA by DFID (May 2013) available from <http://projects.dfid.gov.uk/project.aspx?Project=107480> (accessed 17 October 2013).
3. EIA was awarded the 'local innovation' award at the 2013 ELTons (British Council Innovation Awards).
4. Kukulska-Hulme, A. (2010) 'Mobile learning for quality education and social inclusion', Policy Brief published by UNESCO IITE. PDF available at http://iite.unesco.org/policy_briefs/ (accessed 16 October 2013).
5. Vosloo, S. (2012) 'Mobile Learning and Policies: Key Issues to Consider', UNESCO Working Paper Series on Mobile Learning. Available from <http://unesdoc.unesco.org/images/0021/002176/217638E.pdf> (accessed 4th November 2013).
6. Senior Manager, Mobile and Learning Solutions, Nokia (subsequently Pearson).
7. Head of Research & Development at Lattanzio Learning S.p.A, (was at Giunti Labs during MOBIlearn).