**Institution:** University of Lancaster

**Unit of Assessment:** Education (panel 25, main panel C)

**Title of case study:** Enhancing Learning by Targeting Learner Needs

## 1. Summary of the impact

Our research into learning through digital technologies has increased the focus on the importance of learning processes and context. The research developed new models of *strategic evaluation* and *learning framework analyses* as well as a new concept of *MEGAcognition*. These have shaped the development, customisation and implementation of more appropriate digital educational resources, nationally and internationally. Our research has involved and influenced key national and international companies and groups. Its users have been policy makers and developers, as well as teachers and pupils in primary and secondary schools. The research has: 1) influenced policy and practice developments nationally and internationally (in UK government departments and the e-strategy agency, and in five major resource development companies and corporations with international reach); 2) increased awareness of and engagement in learning opportunities (in four local authorities); 3) built capacity (in three resource development companies and projects); 4) offered insights into ways to develop, refine and customise educational products for specific audiences (in six resource development companies and local authorities); 5) raised awareness and understanding of educational concepts to non-academic audiences nationally and internationally (through 35 public and private seminars and keynote sessions to national and international audiences); 6) raised awareness of learning and pedagogical practices (in six major resource development companies and corporations).

## 2. Underpinning research

Pioneering insights through the research have been generated by working with multiple collaborators and funders, and resultant models of *strategic evaluation* and *learning frameworks* have enabled analyses of learning interactions with digital technologies, detailing how these are embedded in learning landscapes in particular locales. Specifically, focused elements of formal and informal learning by particular groups of learners and teachers have been investigated, identifying the potential of the digital technologies used, and how they positively support motivational and other effects on learners. Key project areas in this research programme have focused on: 1) digital online materials for primary schools; 2) learning platforms for primary and secondary schools; and 3) mathematics software for a curriculum for 11-14 year olds. Three key elements characterise the research thread underpinning these study areas:

1) Creation of a distinctive *strategic evaluation* approach to digital technologies, identifying enhanced user benefit, impacts and perceived value. This formative and iterative approach was designed to maximise long-term impact for developers and implementers (Passey, 1999). Arising from research for the four UK government Departments for Education (1996-1998), it was followed by a research study into deployment of laptop computers into schools and homes for Microsoft (1998-2000) in extending their international *Anytime Anywhere Learning* programme. This pioneering approach to evaluation has underpinned all subsequent studies.

2) Development of detailed schemas for analysing effects of digital technologies on elements of learning (Passey, 2006). This approach is rooted in a social constructivist view of learning (concerning process and context as well as content) that situates the individual within informal and non-formal learning landscapes as well as within a formal curriculum setting. Learning frameworks enable gap and strength analyses of the effects of specific digital technologies on learning (Passey, 2006; Passey, 2011a & b). This new analytical approach has been adopted in implementation studies with a wide range of agencies, including local authorities (Wolverhampton and Worcestershire, for example), agencies developing curriculum approaches integrating parental support with school practices (for a New Deals for Communities region) (Passey, 2011d), and companies developing and providing resources for schools (Research Machines (RM) and Espresso Education, for example). Studies using these approaches have been published in reports (Passey, 2007a; Passey, 2010) and international peer-reviewed journal articles (Passey, 2011b).

Most importantly, it led to real improvements in practices and to changes in local authority policies.

3) Development of an approach to motivation that integrates new and traditional theoretical perspectives. A new concept of learning (MEGAcognition) refers to those elements of learning that lead to or are identified or associated with 'wider and deeper' or 'expert learning'. Motivation is conceptualised in a non-essentialist way, seeing it as integrated in different ways with one or more elements of learning – MEGAcognition, cognition, social, etc. In 2003-2004, this approach was adopted when undertaking a study for the government Department for Education exploring motivational effects on learners of using technologies (Passey, Rogers et al., 2004). The findings of this study provided key insights into ways that technologies develop motivation in different learners, but also how teachers can build on those motivations within a wider curriculum context.

These insights and methods, developed across a wide range of studies over many years, have been used in responses to requests from companies, corporations, trusts, agencies and authorities to investigate questions of interest to them. Consequently, findings have been adopted and put into practice to ultimately enhance benefits for teachers and learners. In general, research such as that involving the company RM that ran from 2001 to 2008, was reported initially to the company, made accessible by them to schools online (Passey, 2007b), and then findings were made accessible through journal articles and a book chapter (Passey, 2011c).

## 3. References to the research

### *Grants*

Research study grants have included: £75,000 from the four government Departments for Education in 1996-1997, £50,000 from Microsoft in 1999-2001, £55,000 from RM in 2001 followed by £29,500 in 2006, £48,700 from the BBC in 2003-2007, £100,000 from the DfES in 2003-2004, £15,740 from a UK regional broadband consortium (CLEO) in 2004-2006, £92,375 from a New Deals for Communities region in 2004-2011, £7,400 from Worcestershire and £19,350 from Wolverhampton local authorities in 2006-2011, and £39,275 from Espresso Education in 2010-2011.

### *Foundational Publications*

Passey, D. (1999). Strategic evaluation of the impacts on learning of educational technologies: Exploring some of the issues for evaluators and future evaluation audiences. *Education and Information Technologies*, *4* (3), 1-28. Peer-reviewed in an international journal, and cited internationally.

Passey, D. (2006). Technology enhancing learning: Analysing uses of information and communication technologies by primary and secondary school pupils with learning frameworks. *The Curriculum Journal*, *17* (2), 139–166. Peer-reviewed in an international journal, and cited internationally.

Passey, D. and Rogers, C., with Machell, J. and McHugh, G. (2004). The Motivational Effect of ICT on Pupils: A Department for Education and Skills Research Project 4RP/2002/050-3. DfES: Nottingham. Peer-reviewed, published by the Department, and cited internationally.

### *Case-focused Publications*

**Reports to funders, with findings reviewed in papers for presentation in international conferences, and subsequently published in international peer-reviewed journals and chapters**:

Passey, D. (2007a). *Virtual Workspace: An Independent Evaluative Review*. Wolverhampton City Council and Worcestershire County Council: Wolverhampton.

Passey, D. (2007b). *Maestro MathsAlive Evaluation Study: An Evaluation of Impacts on Learning – Final Year Summary Report*. RM: Abingdon.

Passey, D. (2010). *Independent Evaluation of the Implementation of the Learning Platform LP+ across Schools: Report on Early Implementation Outcomes in Wolverhampton Local Authority*. Lancaster University: Lancaster. Accessible at: http://eprints.lancs.ac.uk/32663/.

Passey, D. (2011a). *Independent evaluation of the uses of Espresso online digital resources in primary schools: Final Report – Summary*. Lancaster University: Lancaster. Accessible at: http://eprints.lancs.ac.uk/40904.

**Peer-reviewed articles and chapters published in international journals and texts**:

Passey, D. (2011b). Implementing learning platforms into schools: an architecture for wider involvement in learning. *Learning, Media and Technology, 36* (4), 367-397. Selected by a leading publisher (Routledge) to be included in a separate academic book.

Passey, D. (2011c). Learning mathematics using digital resources: impacts on learning and teaching for 11 to 14 year old pupils. In A. Oldknow and C. Knights (Eds.) *Mathematics Education with Digital Technology*. pp. 46-60. Continuum International Publishing: London.

Passey, D. (2011d). Technologies involving parents and guardians with their children's learning. In A. Méndez-Vilas (Ed.). *Education in a technological world: communicating current and emerging research and technological efforts*. Formatex Research Center: Badajoz, Spain. pp. 467-477.

## 4. Details of the impact

Wide ranging benefits have accrued from this research.

**1) Influencing policy and practice developments nationally and internationally**. As the Head of the UK Government ICT in Schools Division in the Department of Education 2000-2008 said, the Passey et al. (2004) research report had: "*delivered some very valuable findings [for example, about uses of interactive whiteboards] and tools [for example, to reflect on effective uses of these technologies] which are still in use in schools today*." He went further and stated that the research had: "*significantly influenced government policy*." For example, this research was a central piece of evidence in the Secretary of State for Education announcement of greater capital investment in technologies in schools (beginning with £25 million in 2003-2004, and a further £25 million in 2004-2005) in an opening speech at the British Education and Training Technology Exhibition (BETT) in London. These decisions have continued to have an effect on the sector and led to widespread adoption and use of technologies such as interactive whiteboards in classrooms both in the UK and internationally. This research continues to strongly inform the work of policy makers. For example the Passey et al. 2004 report was cited by the Secretary of State for Education in an answer to a question about digital technologies on 25th February 2013. Research since 2007 into uses of learning platforms has similarly influenced policy and practice across Wolverhampton Local Authority (supporting e-learning policy documentation and strategy, highlighting important and innovative collaborative online practice within its 80 schools) and impacted company (LP+) platform developments that have been deployed in the UK and internationally (identifying additional useful affordances to support learning). It was built into guidance produced for schools nationally and internationally (detailing effective online uses to support school management needs and enhance student engagement in subject and topic learning).

**2) Increasing awareness of and engagement in learning opportunities**. A wide range of presentations on the research involving 100s of policy makers and practitioners have increased awareness as well as practice, leading to wider teacher engagement. As stated by an E-learning Advisor in the Wolverhampton Local Authority Learning Technologies Team: "*his findings and recommendations have been used to inform future developments [about implementation of emerging technologies] and the City-Wide e-Strategy.*" Concerning impacts on schools (since 2009), he stated that "*his relationships with many schools in Wolverhampton has prompted schools to collaborate on common aims. This has engendered a feeling of collegiality*."

**3) Building capacity** is demonstrated in reports from company personnel as well as those in local government agencies. Research into digital online resources has supported wider product marketing; Espresso Education provides resources to thousands of schools across the UK and internationally, and used findings in 2010 to extend their work. A Project Manager of Aston Pride New Deals for Communities indicated how the research built capacity, stating that: "*his recommendation that a widening of the pilot could have a strong and wide impact on community needs in the future supported the development of a national award winning, three million pound project.*"

**4) Insights into ways to develop, refine and customise educational products for specific audiences** are evidenced in reports from key company personnel; for example, in mathematics software development (MathsAlive and Maestro), as a Senior Manager at RM said, the research from 2001 onwards: *"provided the evidence of how technology can impact learning and has*

*influenced the design [through research feedback of effective forms of interactions] of some of RM's products and services.*" Additionally, the School Improvement Advisor, Worcestershire County Council, indicated how insights impacted on facilities provided for the 58 secondary schools across two Local Authorities: *"This work greatly influenced the direction of the project and made a significant impact on the quality of the service [forms of resources and interactions with schools] provided by the provider."*

**5) The research findings raised awareness and understanding of educational concepts in non-academic audiences nationally and internationally.** This is evidenced through feedback since 2008 from company, corporate and administrative personnel following some 20 separate discussions and seminars - to the BBC (about digital online resources), RM (about MathsAlive and Maestro software), Espresso Education (about digital online resources); and following some 15 keynote talks - to national and international practitioners at events such as BETT, to policy makers and politicians in events at the House of Commons (about digital online resources) and with key media groups (about learning platforms). Findings concerned with key educational concepts have been integrated into texts for non-academic audiences, such as those launched and distributed by the British Educational Suppliers Association (BESA) to international ministers of education in January 2008, or those used by a learning platform company (LP+) to support product use in 2010.

**6) Raising awareness of learning and pedagogical practices** has been a focal aspect of research approach. Findings have been discussed with and impacted non-academic audiences, such as product developers and sales managers. In the case of studies into mathematics software, for example, a Senior Manager at RM stated: "*The work on MathsAlive and Maestro demonstrated the impact of training programmes that were based on pedagogy not technology and this influenced the design of the professional development programmes we created for the Building Schools of the Future bids and ultimately to the success of RM."* Similarly the Chief Education Officer at Promethean stated he considered: "*insights to be unique [such as the shape of lessons with technologies] and I often quote his work when presenting on education productivity, impact and transformation*."

**5. Sources to corroborate the impact**

***Testimonials available from sources additional to those referred to in the text above***

**Impact 1):** Strategic Director – ICT, Partnerships for Schools, An executive non-departmental public body

**Impact 2):** Former Head Teacher Consultant, E-learning Team, Wolverhampton City Council

**Impact 4):** Divisional Manager, Connexions, Sunderland City Council

***Additional documentary sources that can be accessed***

**Impact 1):** Transcript of a speech by the then Secretary of State for Education can be found at: http://collection.europarchive.org/tna/20040722012352/http://teachernet.gov.uk/community/webcasts/bett2004/transcripts/clarke7jan04/
Secretary of State for Education's parliamentary answer on 25/2/2013 can be found at: http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm130225/text/130225w0002.htm

**Impact 2):** The RM Maths Alive website reports: "And most importantly, it's been proven to work! An independent trial carried out by Lancaster University showed that 11% more pupils achieved Level 2 in their Key Stage 1 SATs when they used RM Maths." Accessible at: http://www.rmgraduates.com/default2.aspx?id=18 and a more complete summary at: http://www.rm.com/_RMVirtual/Media/Downloads/MathsAlive_Evidence_Brochure.pdf

**Impact 3):** Inclusion of findings in a video on a company website, accessible to all practitioners, at: http://www.espresso.co.uk/home/ and http://www.espresso.co.uk/reviews/#tab=2

***Contacts who can provide corroborating evidence***

**Impact 5):** Director General, BESA; CEO, LP+.